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THE EFFECTS OF SUPERANNUATION TAX CONCESSIONS ON PRIVATE SAVINGS

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EXECUTIVE SUMMARY

This report examines empirical evidence on the impact of the superannuation tax concessions on voluntary private savings in Australia. Do superannuation tax concessions lead to reductions in other forms of savings? And what are the net outcomes?

In this report, we have examined the impacts of three aspects of Australia's superannuation policies on household saving(s).

- Government co-contributions to superannuation for low-income earners, in terms of both the co-contribution rate and the dollar cap for the maximum co-contribution paid by the government;
- The concessional contributions cap, which places a ceiling on the amount contributed to a person's superannuation account at a concessional tax rate; and
- Division 293 tax policy, which introduces an additional tax charged at 15% of an individual's taxable contributions for individuals whose earnings (including contributions) are greater than the Division 293 threshold.

We also examined whether these policies had heterogeneous effects across different groups – by age, gender, education, employment status and age group of the household head and location of the household.

The report draws on data from the Household Income and Labour Dynamics for Australia survey, Restricted Release 18. We estimate a panel fixed effect model and a (Heckman) sample selection model, using data from 2005 - 2018. In all our models, the unit of analysis is the household as defined by the Australian Bureau of Statistics.

We use two different measures of saving(s). The first defines saving (a flow variable) as the difference between household disposable income and household final consumption expenditure, available annually in the Household Income and Labour Dynamics for Australia survey. The second measure uses household wealth as a proxy for savings (as a stock variable), collected every four years by the Household Income and Labour Dynamics for Australia survey. Both are in terms of dollars.

We find:

- **The government co-contribution to superannuation for low and middle-income earners has an insignificant impact on private household saving.** Increases in the government co-contribution rate and dollar cap have led to a marginal rise in the superannuation balance of households, without reducing other savings. However, the effects are small. As a result, there is no significant impact on household wealth.
- **The concessional contributions cap has marginal impacts on household saving and wealth.** Although a $1 increase in this cap reduces private saving by a small amount, it does not reduce overall household wealth. Increases in the concessional contributions cap improve household superannuation balances, though there is some delay in the response.

Household who pay the Division 293 tax have 12.7 per cent less private savings than those who are not liable for paying the tax. But households who pay the Division 293 tax have significantly higher superannuation balances than others because these are the wealthier households and an additional 15 per cent tax on individual taxable contributions is still less than what these households would have paid had they saved that amount outside the superannuation account. **When compared to households with individual income marginally below the Division 293 threshold, we do not find any significant effect of this tax on the wealth or superannuation balances of households who pay the Division 293 tax.** We also find that the effects of the government co-contribution and concessional contributions cap on household saving vary by the household head's education, marital status, labour force participation status, age and income quantile. Among the findings:

- Households with married heads save less than households with unmarried heads.

- Households whose heads have at least a diploma save more than households with less-educated heads when they are eligible for superannuation co-contributions and concessions.
- Households in the 3rd and 4th quantiles save more than those in the 1st quantile if they have a member eligible for the government co-contribution. Nevertheless, these differences are not statistically significant at 5%.

Numerous studies in the literature have examined how savings in superannuation accounts affect other forms of savings. Still, few have measured the effects of concessional tax policies on household saving(s), particularly in Australia. Evidence of whether superannuation tax concessions generate new private savings – both from Australia and overseas – is mixed.

There is evidence that some people reallocate some savings from other sources to pension saving accounts in response to tax incentives provided for pension savings. However, as the reported offset rate between pension savings and other forms of savings varies, the extent of new savings generated by pension tax concessions is unclear.

In the United States, studies in the 1990s were inconclusive on whether Individual Retirement Accounts (IRAs) and 401(k) pension accounts generated additional savings. However, later research seems to confirm evidence of new savings.

Our results show that superannuation tax concessions do not have any significantly negative effect on household savings in Australia. As a whole, the tax policies seem to improve household superannuation balances to some extent, and not at the expense of other non-super wealth. Hence, new wealth is generated. However, the impact on wealth is marginal. These findings are consistent with behavioural theories that argue most savers are passive. Holistically, tax incentives may work better when coupled with non-tax based behavioural incentives.

INTRODUCTION

The Australian retirement system is regarded as one of the world's best, ranked third following Netherlands and Denmark by the Melbourne Mercer Global Pension Index in 2019 (Mercer, 2019).

Compulsory superannuation is one of the three pillars of Australia's retirement income system. The other two pillars are a means-tested age pension, and voluntary private savings (which includes homeownership, bank accounts and other private investments).

The Australian Government has devised several concessional instruments for superannuation. These include the government co-contribution for low-income families, tax concessions on contributions and the Division 293 tax. These elements were devised or revised under the Simpler Super reforms in 2007.

These instruments may have implications outside their targeted goals. For example, tax concessions that encourage voluntary savings in superannuation accounts (such as salary sacrificed contributions and other personal contributions) may come at the cost of reducing other forms of savings. If the trade-off between different types of savings were one to one, this would mean a redistribution of total savings across different mechanisms, but with no new savings created. In turn, this would raise questions about the cost-effectiveness of such a policy. Therefore, it is imperative to understand how existing tax policies related to superannuation have affected private household savings. Specifically, it is important to know whether the policies have resulted, in substitution of private savings and, if so, to what extent. Or is there complementarity between the two?

Using Household Income and Labour Dynamics in Australia (HILDA) survey data from 2005 to 2018, we find that the government co-contribution policy marginally improves household saving and wealth. It also helps to boost the superannuation balances of households eligible for this co-

contribution. We also find that the concessional contributions cap has a marginally negative impact on net household private saving. A $1 increase in this cap reduces net household private saving by 0.00003% and has an insignificant effect on overall household wealth. Finally, while the Division 293 tax reduces private net household saving; it has no significant impact on household wealth.

The rest of this report is organised as follows. The next section illustrates the different concessional taxes affecting the superannuation system in Australia. Section 3 outlines the literature related to savings and tax incentives in the context of pension plans in different parts of the world. In Section 4, we describe the empirical models and the methodology used to analyse the effects of retirement savings incentives. Section 5 summarises the data we use and presents the results. Finally, Section 6 analyses the findings and their policy implications.

SUPERANNUATION POLICIES IN AUSTRALIA

The superannuation system

Superannuation encompasses Pillar Two and Three of the retirement income system. It consists of compulsory employer contributions via the Superannuation Guarantee, currently, at 9.5 per cent of wages, additional superannuation contributions made by the employers, voluntary superannuation savings made by employees as well as government co-contributions for eligible households. The superannuation system is designed with various sources and mechanisms of contributions, reflecting the responsibility of individuals, employers and the Government for contributing to the future retirement income of all.

Apart from the variety in sources of contributions, the superannuation system is also characterised with different tax mechanisms. Superannuation contributions can be made with and without tax concessions. As estimated by Vanguard in 2019, approximately 12% of over two million members in their study, who are working members, made salary sacrificed or non-concessional contributions or both[1]. For those that have both contributed via salary sacrifice and personal post-tax contributions, the median total contribution rate was 30.1% for the fiscal year ended in June 2018.

The following figure illustrates the various components of the current superannuation system in Australia.

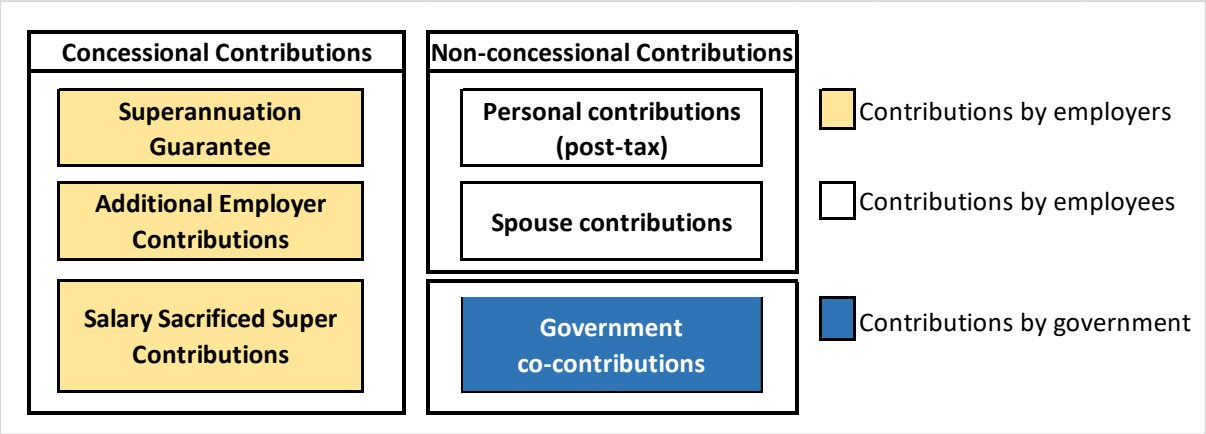

Figure 1: Types of superannuation contribution in Australia

[1] Vanguard (2019), *How Australia Saves 2019 – A Report on Superannuation Data,* Vanguard Investments Australia. The report is on over two million members of First State Super, Sunsuper, and VicSuper.

Together with the means-tested Age Pension, the superannuation system is designed to provide retirement income adequacy for Australian residents, as well as fiscal sustainability for the Australian Government.

History of legislated superannuation guarantee and related policies

The superannuation regulatory framework has been continuously evolving. A significant part of the evolution is the change in the prescribed SG rate.

A careful examination of the Australian retirement income policy and legislative chronology reveals that apart from the changes in the legislated SG rate, there have been several changes in the tax structure that could eventually affect the saving behaviour of households since the beginning of this century. Superannuation contributions and earnings are taxed at a concessional rate compared to other forms of saving. Retirement benefits are tax-exempt as well, providing an incentive for people to save toward retirement within the super system.

Contributions	Earnings in Super Account	Benefits Payout
Concessional contributions are taxed at a concessional rate of 15%. Non-concessional contributions are made from after-taxed income. Concessional cap and non-concessional contributions caps apply.	Earnings within Super are taxed at a concessional rate of 15%.	Super benefits are tax exempt, subject to eligibility. Transfer Balance Cap: $1.6m

Figure 2: Tax features of superannuation contributions, earnings and payouts

In the process of evolving into the current system, however, there have been several critical changes in features of each policy such as rates, caps, income thresholds, and age thresholds. All these policy changes will provide us with some variations over time and across households, in terms of income levels and age, to precisely estimate the impact of these tax concessions on household saving(s).

The following changes in superannuation tax concessions policies occurred in the last two decades-

i. Simpler Super Reform in 2007
ii. Super contributions surcharge
iii. Concessional contributions cap
iv. Government co-contributions
v. Concessional contributions (Division 293)

i. Simpler Super Reform

The year 2007 was an important milestone being the year of the Simpler Super Reform. The Reform removed the Reasonable Benefits Limit[2] used to determine the tax rate for benefits received by each person. The Reform also made withdrawals of retirement

[2] Prior to 2007, the Reasonable Benefit Limit rules set limits on the superannuation entitlements, either as a lump sum or pensions, a person may receive at concessional tax rates. Beyond the person's RBL, the concessional tax rates no longer applied. See ATO for past concessional tax rates and limits: https://www.ato.gov.au/rates/key-superannuation-rates-and-thresholds/?page=37

benefits tax exempted[3], creating a tremendous tax incentive for saving toward retirement. Although this removal of the benefits tax in 2007 did not affect all individuals instantly, the expectation of having to pay no taxes on future retirement benefits could have encouraged people to save more, especially for those in an older age group.

ii. Superannuation contributions surcharge

Before 2005, people on higher incomes were subject to a surcharge rate that applied to surchargeable contributions.

Before the super contributions surcharge was abolished from 1 July 2005, for those with adjusted taxable income higher than the higher income threshold, the maximum surcharge rate may apply to the surchargeable contributions. The maximum surcharge rate was 15% during the period 1997 – 2003, then it was reduced to 14.5% in financial year 2003/2004 and 12.5% in 2004/2005 (Please see Table 1 on page 34 for details). For those with adjustable income staying between the lower and higher income thresholds, the surcharge liability would be determined by the applicable surcharge rate[4]. There was no surcharge for those with adjusted taxable income below the lower income threshold.

Using the HILDA survey in the early waves from 2001 to 2005 (1-5), it is possible to identify the effect of this policy on household saving(s). However, since the HILDA survey does not have complete information on household expenditures in those waves and data on wealth is available only for 2002, it would not be possible to measure the effect of this specific policy using the methodology applied in this paper. We, therefore, exclude this policy from our analysis of household saving(s).

iii. Superannuation concessional contributions cap

In order to promote savings, the Government provides a range of tax incentives for superannuation contributions, earnings and benefits. However, these concessions mustn't be abused as a way to exploit the system at the expense of lost tax revenue of the Government. These concessions, therefore, need to be capped.

Concessional contributions include employer superannuation contributions and personal contributions claimed as a tax deduction, all subject to an annual cap.

From financial year 2017/2018, the concessional contributions cap is $25,000 for all ages. Prior to 2017/2018, the cap was higher and varied for different age groups. There were some major revisions to the cap in 2007/2008, 2009/2010, 2012/2013, 2013/2014 financial years. Table 1 presents details of the historical changes in the concessional contributions cap and relevant conditions.

If superannuation tax concessions are effective in promoting savings, household savings should also respond to the changes in concessional contributions cap. For simplicity, in this analysis, we do not consider changes in the unused concessional cap carried forward, excess concession contribution charge, and non-concessional contributions cap. The

[3] For those aged 60 and above. Other rates apply to those under 60. See ATO.

[4] The surcharge liability = the surchargable amount x the surcharge rate (%). The surcharge rate (RATE) = [the adjusted taxable income – Lower income threshold] ÷ Divisor

concessional contribution caps and the relevant age requirements in Table 1 were used in the model analysing the impact of changes in concessional caps.

iv. Government co-contributions and Low-income super tax offsets (LISTO)

Low-income earners are supported by the government superannuation co-contribution policy, in which the Government contributes to the superannuation account of eligible households, and the low-income superannuation tax offset (LISTO).

The Government matches low-income earners' personal superannuation contributions by a co-contribution to their accounts up to a certain limit. From July 2012, the maximum co-contribution entitlement was set at $500 with a matching rate of 50%. Previously, the maximum co-contribution entitlement was at $1000 (in FY 2003/2004), $1500 (from FY 2004/2005), and $1000 (from FY 2009/2010). The lower-income and higher-income thresholds also varied during the last two decades. To analyse the impact of government co-contribution policy, we will focus on the low-income earner group and examine if their savings behaviour responds to changes in the policy.

The low-income super tax offsets (LISTO) used to be known as the low-income super contribution (LISC) before 1 July 2017. LISTO is the refund of 15% of the concessional (before tax) superannuation contributions, including those made by both employers and employees, also capped at $500. As of 2020, LISTO support is available only to those earning $37,000 or less a year[5].

	Government co-contributions	**LISTO**
Mechanism	Co-contribution amount that matches the individual's personal contribution, subject to a cap	the Government's superannuation payment representing a tax offset
Payment	Paid directly to the individual's super account	Paid directly to the individual's super fund
Applicable contribution	Non-concessional (post-tax) personal contribution	Concessional (before-tax) contribution
Source of contribution	Employee	Employer and employee
Eligibility (as of February 2020)	Income lower than the higher income threshold of $53,546	An annual income of $37,000 or less
Rate	50% of the personal contribution (subject to a cap)	15% of the concessional super contributions (subject to a cap)
Cap ($) (as of 2020)	$500	$500

We use the historical rates and threshold information of government co-contribution. For LISTO, we need to know the total dollar values of employee and employer contributions into superannuation in a tax year. The data on the dollar value of total superannuation contributions is not available for everyone who received or made a contribution in HILDA.

[5] With a condition that 10% or more of the person's total income comes from business and/or employment.

We, therefore, will only examine the impact of the government co-contribution scheme and exclude LISTO from our analysis. The details are provided in Table 1 at the end of the report.

v. Concessional contributions (Division 293)

Division 293[6] is an additional tax charged at 15% of an individual's taxable contributions for individuals whose earnings (including contributions) are greater than the Division 293 threshold. Division 293 tax is payable on the lesser amount of the excess over the threshold or the superannuation contributions. The purpose of the policy is to reduce the tax concession enjoyed by individuals with high income who are generally in a high-income tax bracket.

Our empirical analysis will also consider if the introduction of Division 293 tax has any impact on the saving behaviour of household with high income.

Table 1 illustrates all relevant changes related to superannuation rates and thresholds over the last 20 years. The Government's concerns over low private saving have led to a variety of superannuation and tax-related policies to promote private saving toward retirement. As a lot of changes have happened during recent years to the concessional tax rate, the concessional and non-concessional contributions limits as well as age-based and income-based conditions, it would not be an easy task to separately evaluate the impact of these tax policy changes on household saving.

HOUSEHOLD SAVING(S) IN AUSTRALIA

Definition of saving

The ABS defines net household saving rate as the ratio of household net saving to household net disposable income. Household net saving is calculated as household net disposable income less household final consumption expenditure. We use net household saving as one of our dependent variables.

Wealth could also be used as a measure of household savings. Connolly (2007), for example, use the amount of net financial wealth and household wealth as a per cent of income as proxies for household savings.

Household saving(s) in Australia

Figure 3 presents the net household saving rates in Australia in the last two decades. The savings rate has been meagre around the beginning of this century. It started to increase during the later years of the last decade and then again began to plummet since 2016. In 2019 it was at its lowest in a decade (2.7%).

[6] The measure was announced in the 2012 Federal Budget and legislation was passed in 2013, including the Tax and Superannuation Laws Amendment (Increased Concessional Contributions Cap and Other Measures) Act 2013 and Superannuation (Sustaining the Superannuation Contribution Concession) Imposition Act 2013.

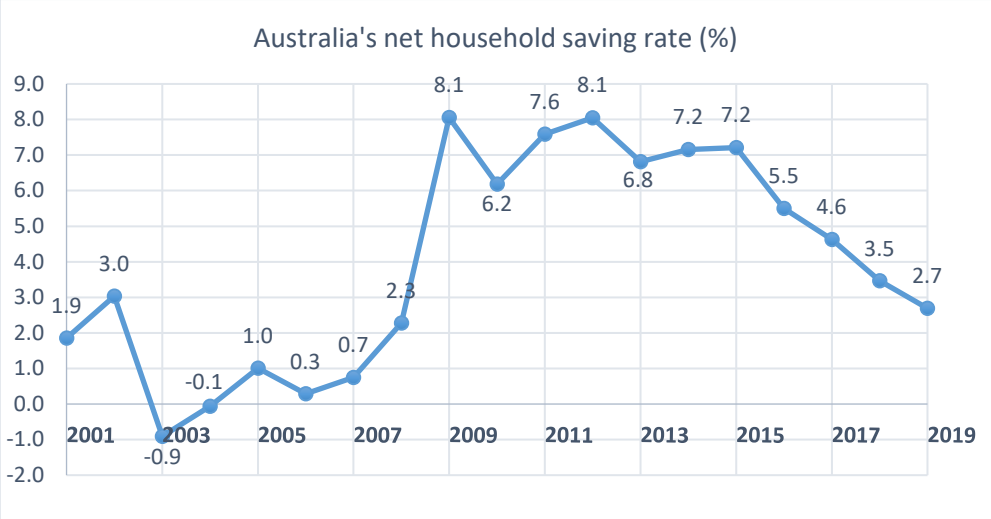

Figure 3: Net household saving rate in Australia - Source: ABS statistics

The link between household saving and wealth

Household saving is the flow of saving, which is added to the accumulated household wealth, measured by the household net worth. In other words, household wealth is the stock of savings. In this report, *saving* refers to the annual flow of saving whereas *wealth* refers to the stock of savings.

Household wealth is an accumulation of household saving over the years. It is calculated as the total value of financial and non-financial assets less the liabilities. The following table shows the distribution of household wealth in Australia from FY2005/2006. The net worth of households increased by 28.70% in the ten years from FY2005/2006 to FY2015/2016, and then another 6.06% in the following two years. The share of financial assets in net household assets increased from 37% to 42% during the same period. In FY2017/2018, according to the ABS, the mean net worth of the Australian households was over $1 million.

Household asset and liabilities	2005–06	2015–16	2017–18
Mean household net worth	$748,900	$963,800	$1,022,200
Mean total financial assets	$275,900	$392,700	$427,700
Mean total non-financial assets	$596,000	$749,100	$778,800
Mean total liabilities	$123,000	$174,900	$183,900

Source: ABS statistics

Figure 4, below, illustrates the link between household saving and household wealth. According to the HILDA Restricted Release 18 manual, the total gross income in a financial year of a household includes all regular income such as wages and salaries, business income, investment income, transfers and irregular income. Salary sacrificed superannuation contributions are made from pre-tax income.

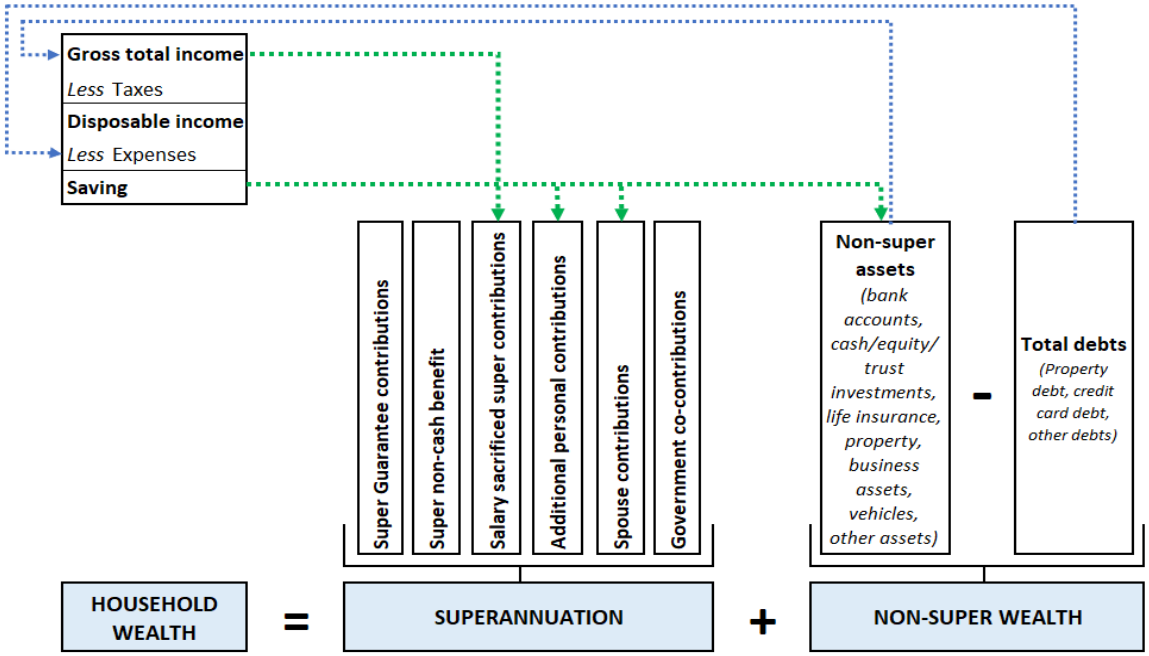

Figure 4: Household saving and household wealth

Household saving is the residual of disposable income after all household consumption expenses. It is net of concessional contribution to super. This saving can be allocated to (non-concessional) superannuation contributions or other non-super saving vehicles and assets. Saving can be used to finance additional (post-tax) personal super contributions and spouse contributions. Regarding the non-super channels, households can put their saving into various asset classes such as bank accounts, cash investments, securities investments, trusts, life insurance etc. These non-super assets can be financial or non-financial, such as property, vehicles and collectables. A household's wealth, the so-called 'net worth', is the total value of super and non-super assets less its total debts.

Household assets and debts, in return, interact back with household saving. Rental income, capital gain, dividends and interests earned from assets contributes to the household income while debts add to household expenses.

As both super and non-super assets constitute the key components of household wealth, the flow of saving, therefore, adds to the stock of household wealth. Vice versa, a household's level of wealth could affect its saving behaviour.

In this report, we examine the relationship between superannuation tax incentives and relevant concepts of household saving, including saving as the flow; as well as household superannuation asset, non-super wealth and total wealth, as the stock of savings.

LITERATURE REVIEW

Most empirical research reviewed in this report address the questions of how tax and other incentives have worked or could have worked better to promote saving(s). Although the literature on the link between superannuation tax incentives and household saving(s) in Australia is limited, the research from the US, UK and other countries is voluminous.

The theoretical foundation of savings

The literature on superannuation and savings spans across the fields of social and behavioural sciences and public policy. Seminal economic theories underpinning the research on savings and the saving effects of pension and tax policies are the intertemporal optimisation theory, the lifecycle hypothesis and behaviour theories.

Fisher (1930) developed the theory of intertemporal consumption in his seminal book *Theory of Interest*, which provides a framework for understanding how individuals choose between consumption today and consumption tomorrow. Based on this theory of intertemporal consumption, later, Modigliani and Brumberg (1954) introduced the lifecycle income hypothesis, and Friedman (1957) developed the permanent income hypothesis.

The permanent income hypothesis (Friedman 1957) argues that intertemporal consumption and saving decisions are made based on the principle of optimisation given the level of permanent income, rather than temporary income as temporary variations to disposable income average out in the long run. Similarly, the lifecycle hypothesis (Modigliani and Brumberg 1954) explains consumption and saving behaviour based on the assumption that people always aim to maximise their utility given the intertemporal resource constraints. This theory predicts that contributions in tax-favoured accounts, such as pension accounts, substitute other forms of saving. As a result, the lifecycle hypothesis predicts that the contributions in tax-favoured accounts do not create new private saving. Variations and extensions of the original lifecycle hypothesis include those with bequest motives, liquidity constraints, and uncertainty (See Bernheim (2002) for the comprehensive review)[7]. The introduction of uncertainty and liquidity constraints in the model reduces the degree of substitutability between illiquid tax-deferred savings and liquid financial assets as uncertainty increases the value of liquidity. As a result, liquidity-constrained individuals are expected to be less responsive to tax-incentivised voluntary pension saving policies under uncertain economic environment.

Another stream of literature, grounded on behavioural theories, assumes that people do not always respond rationally to the economic incentives embedded in pension and tax policies. The evidence of behavioural decision-making effects in savings outcomes has grown well in the last two decades.

This new strand of literature on household saving behaviour originated in the US (Shefrin and Thaler 1988); Thaler (1990); Thaler and Benartzi (2004); Duflo, Gale et al. (2006); and Carroll, Choi et al. (2009)). It has evolved around behavioural economics and developed into the behavioural lifecycle theory. While people want to optimally smooth consumption, and hence, plan to save, throughout a lifetime, there are cognitive and emotional biases leading to suboptimal decision making. The concept of bounded rationality (Simon 1957) challenges the prediction of the traditional lifecycle hypothesis in individuals' decision making. It argues that bounded rationality, such as mental accounting (Thaler 1990), individuals' self-control ability and their perception of control (Cobb-Clark, Kassenboehmer et al. 2016) compromise individuals ability to implement the saving decision due to the complexity of intertemporal planning. Clark, Strauss et al. (2012) explains how intuition, habits and imitations influence the saving decision of a person.

[7] Please see Bernheim (2002) for the detailed review of studies using LCH. Most reviewed studies are from the United States.

From a policy perspective, the design of incentive mechanisms (tax concession or co-contribution, for example) that encourage savings needs to be guided by these behavioural biases. The consideration of behavioural biases in decision making has given rise to policies that nudge people to save more toward their retirement, advocated by libertarian paternalists (Friedman 2015, Statman 2017). These nudges are default options, automatic enrolment into employer contribution accounts and pre-set contribution rates, which can be libertarian in the sense that individuals can opt-out if they wish to do so.

The behavioural literature has expanded its scope beyond the individuals making a decision. Several studies in the behavioural stream have focused on the role of other agents as third parties, such as tax advisors and employers (Choi, Laibson et al. 2002, Duflo, Gale et al. 2006) in providing behavioural nudges to promote private saving behaviour and improve the effectiveness of tax incentives.

Empirical evidence on the effect of superannuation tax concessions

The pension tax literature reviewed in this report focuses on the three central questions concerning superannuation tax policies:

1) whether tax programs generate the desired response and participation by individuals and if people participate, whether it creates new private savings,
2) how people respond to changes in tax-related features of established programs, and
3) how people react to non-tax incentives and nudges designed to support savings.

Responses to tax programs: is new savings generated?

There is a large volume of literature on pension program eligibility and participation in response to the introduction of new major tax-incentivised pension programs such as the Superannuation Guarantee in Australia, Individual Retirement Accounts (IRAs) and 401(k)s in the US and the Individual Savings Accounts (ISAs) in the UK. However, it should be noted that the key difference among them is about who can make the contributions into these accounts and if contributions are mandatory. In Australia, the superannuation guarantee contributions to the superannuation account are compulsory for most income earners, and the responsibility to make contributions belongs to the employers; whereas, for IRAs and ISAs, it is the individuals that contribute to the pension account.

There should be a link between saving in superannuation and other savings. Questions worth examining are whether policies work in promoting superannuation savings and whether superannuation crowds out other savings. Empirical evidence on the relationship between superannuation and savings in other forms induced by tax policies in Australia, the US and the UK, and other countries, is presented next.

The Australian experience

In the Australian context, major research works on superannuation and savings are Morling and Subbaraman (1995), Connolly and Kohler (2004), Connolly (2007), and, more recently, Feng (2014), Feng and Gerrans (2014) and Shanker and Vidler (2014). Most studies find that the substitution between superannuation and other savings is not close to perfect. Besides, the level of substitution varies across different household groups. However, as reported findings vary greatly, the extent to which compulsory superannuation saving adds to aggregate savings is unclear.

Different sources of data have been used in this stream of literature in Australia, including ABS aggregate data, the HILDA survey data and more recently, fund members' data provided by the super funds. The discussion that follows will highlight the most relevant studies in more details.

Prior studies in Australia focus on various types of superannuation contributions and savings, as illustrated in Figure 5. While Morling & Subbaraman (1995) study the link between the total super savings and non-super savings, Connolly & Kohler (2004) and Connolly (2007) examine the interaction between compulsory superannuation and other savings.

Figure 5 presents the possible links among various components of the Australian superannuation system. Compulsory superannuation contributions do not represent an individual's response to superannuation tax incentives; instead, it is the obligatory contributions made by the employers. Therefore, we are more interested in the interactions between voluntary superannuation savings and other (non-super) savings that could result from the tax incentives provided.

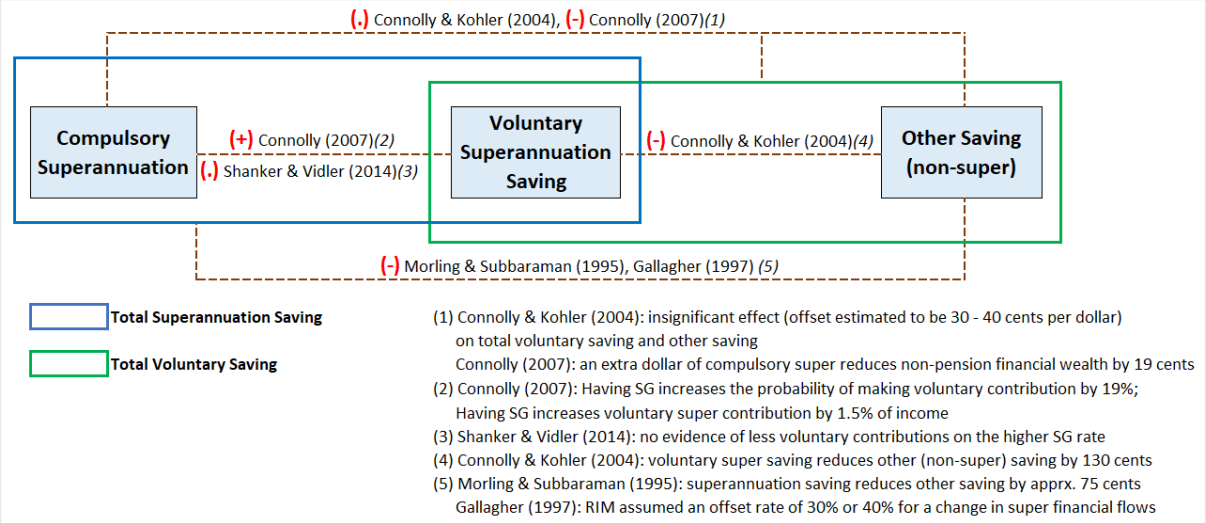

Figure 5: Major studies on superannuation and non-super savings in Australia

The study by Morling and Subbaraman (1995) is among the early ones[8] that examine the impact of superannuation on private savings. However, they do not segregate superannuation into employer contributions and voluntary contributions. Using aggregated time-series household savings data from 1959 to 1994, Morling and Subbaraman (1995) report a substantial substitution effect of approximately 75 percentage points between tax-incentivised superannuation savings and non-super savings, both in the short-run and long-run. The findings suggest that people reallocate their savings from other savings to tax-advantaged superannuation savings with the offset rate estimated to be approximately 75%. However, Morling and Subbaraman (1995) argue that for wage and salary earners who face liquidity constraints, the offset rate between superannuation and other forms of savings would be lower.

Adopting a similar approach to Morling and Subbaraman (1995), using aggregated data from 1966/67 to 2001/02, Connolly and Kohler (2004) estimate the offset effect between voluntary superannuation contributions and other (non-super) savings. They find that a dollar of voluntary

[8] For a review of research prior to 1995 on the offset impact between superannuation and other forms of saving, please see Gallagher (1996).

superannuation savings crowds out other non-super savings by 130 cents. This implies that superannuation tax incentives shift money away from other forms of savings.

Other researchers also apply specific offset rate to model how superannuation flows interaction with other savings. For example, as explained by Gallagher (1997), the Retirement Income Modelling Taskforce recommended an offset rate of 30% to reflect the extent to which tax-incentivised superannuation savings crowd out other private savings.

It is challenging to conclude on the link between different types of savings because the interaction between various components of the superannuation system is so complicated. Having received compulsory employer contributions may affect how people make voluntary contributions when superannuation tax concessions are provided. In 2007, Connolly again came back to the topic of superannuation and household saving, however, with a different approach using the data collected from the HILDA survey in Australia in 2002. Using household-level data would allow the examination of household saving behaviour, taking into account the heterogeneity of the households, which is not possible if with aggregated data. Connolly (2007) finds that having access to compulsory employer contributions generally has a positive impact on household wealth. Specifically, the probability of making voluntary contributions is 19% higher, and the extra savings is 1.5% of labour income if the household receives compulsory contributions.

Saver heterogeneity is also an important consideration in analysing people's saving behaviour in response to superannuation tax incentives. Feng (2014) and Feng and Gerrans (2014) find that in Australia, personal characteristics such as - gender, income level, and homeownership influence participation rates and contribution levels for both concessional and non-concessional superannuation contributions. Saver heterogeneity could be an impediment to determining the saving effect of tax incentives if not specified correctly in a model.

Given the various offset rates reported in the literature and the added complexity of saver heterogeneity, the exact magnitude of the impact of tax incentives provided for superannuation savings on net new savings is, inconclusive, at least for Australia.

The international experience

Although there are critical differences between the pension systems in the US and Australia, some studies provide helpful insights into the link between various components of the system, such as the relationship between employer and employee pension contributions, and that between pension and non-pension savings.

Back in the early day, Katona (1966) asserts that having private pension accounts motivates households to save more. Since then, the pension system in the United States has evolved substantially with more tax-linked savings products and services. Before delving into the empirical evidence of how they impact savings, it is useful to understand the essential features of the leading pension saving accounts available in the US now.

The literature from the US centres on the two major retirement savings products - the IRA and the 401(k) accounts. The US introduced IRAs in 1974 as a tax-deferred retirement savings vehicle set up by individuals. In the traditional IRAs, contributions, subject to an annual cap, are made by the individuals and are tax-deductible. Withdrawals in retirement are taxed at the ordinary personal income tax rate. When its eligibility was expanded in 1981, IRAs became popular for people at

various income levels, not just the wealthy ones. As of 2020, apart from the traditional IRAs, there are Simple IRAs and IRAs for the self-employed and small business owners and Roth IRAs[9] for individual taxpayers with different tax incentives.

Another savings vehicle, the 401(k) accounts, was introduced in 1978 with tax-deductible contributions from employees, typically matched by employer contributions. 401(k) offers tax-free returns on investment and tax paid upon withdrawals. As both IRAs and 401(k)s are earmarked for retirement saving, there is a penalty for early withdrawals, similar to the superannuation accounts in Australia.

There was a heated debate in the literature in the 1990s and early 2000s on the extent to which tax-incentivised pension savings in IRAs and 401(k)s represents new savings rather than a reshuffling of assets from non-tax advantaged vehicles. The debate heightened in the mid-1990s. While Poterba, Venti et al. (1996) assert that IRAs and 401(k) contributions are not substitutes of other financial assets, Engen, Gale et al. (1996) argue that tax incentives have little impact on household savings. According to Engen et al. (1996), other papers have overstated the effectiveness of these savings tools.

While studies in the 1990s were inconclusive on whether IRAs and 401(k)s generate new savings, later works seem to agree on the evidence for new savings, at least as a partial effect (Chernozhukov and Hansen 2004, Card and Ransom 2011, Gelber 2011). Below is a summary of the findings from the US.

Evidence that proves new saving

Studies	Findings
Venti and Wise (1991)	IRAs has insignificant substitution effect as increased saving is financed by reduced consumption (2/3) and reduced taxes (1/3) rather than other savings or debt.
Poterba and Venti (1994)	401(k) savings represent new savings as 401(k) contributors save more than non-contributors There is little evidence of substitution between 401(k) contributions, other financial assets and IRAs.
Venti & Wise (1995)	There is little change in other financial assets when a household starts or stop contributing to IRAs.
Chernozhukov and Hansen (2004)	401(k) participation has a significant effect on both net financial assets and total wealth. Impact of 401(k) participation on net non-401(k) financial assets is insignificant. For cases in the lower tail of wealth distribution, most saving in 401(k) accounts represents new savings.
Gelber (2011)	401(k) eligibility increases 401(k) balance and reduces the consumption of durable assets.

Evidence that rejects new saving

Studies	Findings
Gale and Scholz (1994)	Changes in IRA limits have no significant impact of on national saving. Only 2% of the increase in IRA contributions would represent new net national saving.
Chernozhukov and Hansen (2004)	For cases in the upper tail of wealth distribution, a substantial substitution effect is documented.
Card and Ransom (2011)	Each dollar of employee contribution reduces supplementary saving by 60-80 cents.

[9] Roth IRAs: contributions are made from after-tax income; however, its investment gains and withdrawals during retirement are tax-free.

	No evidence that 401(k) eligibility crowds out other financial assets and net worth.		Each dollar of employer contribution reduces supplementary saving by half.

The debate in this stream of literature centres on how the models used to measure these relationships deal with the saver heterogeneity and endogeneity. The availability and quality of large-scale longitudinal datasets on individuals or households over time has made it possible to study saving at the household and individual level. However, even with the best survey data, it is challenging to measure and model household financial decisions because each household or individual is unique in their characteristics and behaviour biases (Campbell 2006).

The randomised control trial (RCT) method (Duflo, Gale et al. 2006, Chetty and Saez 2013) could offer an approach to address saver heterogeneity and identification. However, unless correctly run, even an RCT will not be capable of controlling for every possible type of heterogeneity (Poterba et al. 1996). In the absence of a perfect RCT, researchers have used several approaches to improve the identification strategy. The first approach is within-group change analysis by following the same household over time to examine the change in assets or savings before and after an event of interest happens, such as the change in tax incentive provided or employer contribution eligibility (Venti and Wise (1995). The second approach is a between-group comparison in which one can compare the saving levels of two groups at the same point in time with the condition that the compared groups are different only in terms of the examined factor. This approach is used by studies that compare the saving of households with and without a 401(k) account (Poterba, Venti and Wise 1995). The question is whether 401(k) eligibility is truly exogenous. When unobservable factors associated with saving behaviour influence the participation in 401(k), the estimates could be biased. While one can argue that participation is exogeneous as the employers determine the eligibility (Poterba, Venti and Wise 1995), it may be plausible that employers consider their employees' preference in offering the account (Engen, Gale et al. 1996). It is also possible that people who want to save more would prefer to work for companies with generous 401(k) offerings. 401(k) eligibility may not be as exogenous as it seems to be. Therefore, the challenge for this method lies in the matching exercise to ensure that the compared groups are comparable in terms of saving preference. Alternatively, researchers can analyse by cohort to examine if the saving pattern of the subject group over different stages in the lifecycle is different from the pattern observed for other groups. This approach is possible with a longitudinal dataset.

While researchers from the US dominate the various streams of literature related to tax and pension savings, empirical evidence from other countries is relatively scarce. The following discussion touches on several studies that could provide an insight into how people save within and outside the pension system in response to tax incentivised pension policies around the world.

In the UK, adopting the lifecycle hypothesis of Modigliani and Brumberg (1954), Green (1981) examines the changes in other savings in response to the increase of pension assets. They use two databases providing survey data on personal savings in this paper, including the 1953 Oxford Savings Survey (OSS) and the annual Family Expenditure Surveys (FES) 1969. Green (1981) argues that if individuals have a target saving level, they will reduce other savings when their savings in more tax-favoured pension accounts increase. The finding of an insignificant substitution effect between pension savings and other types of savings has rejected his hypothesis that people have a desired saving target.

Using the same FES data but at a later period from 1974 to 1987, Attanasio and Rohwedder (2003) also employ lifecycle model to examine the association between pension wealth and other household savings in the UK. The paper proposes an innovative approach to measuring pension wealth. Perceived pension wealth is calculated as the sum of the present value of all expected future pension benefits less the present value of all future contributions. The paper considers three key reforms in UK pension system including the two changes in the indexation of the Basic State Pension (BSP) in 1975 and 1981 and the implementation of the State Earnings-Related Pension Scheme (SERPS) in 1978[10]. For SERPS, Attanasio and Rohwedder (2003) document a substantial substitution effect between pension wealth and other savings for people above 31, but this impact is insignificant for the younger group. For BSP, they find little evidence of substitution between BSP saving and other financial assets for all age groups. Attanasio and Rohwedder (2003) argue that the liquidity constraints may explain the insignificant substitution effect among young and poor groups of individuals who are typically not eligible for SERPS. In contrast, in another research using data from the Family Resources Survey during the period from 1998/99 to 2002/03, Attanasio, Banks et al. (2004) document a significant substitution effect between contributions in pension plans and other household assets in the UK.

Adopting another approach, Blundell, Emmerson et al. (2006) examine changes in the private spending pattern as an indicator for savings. They find that spending by working-age individuals increased upon the introduction of SEPRS, signalling no added savings. In summary, the literature from the UK seems mostly inconclusive on whether pension savings resulting from tax concessions represents new savings.

In New Zealand, based on a national survey conducted in 2010[11] on KiwiSavers, a voluntary saving account similar to the IRAs in the US, the New Zealand Treasury reported the evidence that a third of the contributions made to KiwiSaver accounts represent additional savings (Law, Meehan et al. 2011). In the long run, however, the estimated effect of the program on net national savings is only marginal or even negative considering public contributions through tax concessions and direct grants.

The evidence from Spain is mixed among studies that use change in consumption to indicate savings and those that examine changes in savings contributions directly. Using the Spanish Survey of Household Finances in 2002 and 2005 of the Bank of Spain and the National Statistics Institute, Anton, Bustillo et al. (2014) find that tax-favoured contributions to a pension fund are not associated with a lower consumption level (with and without consumption of durable goods). This implies that this policy does not increase national saving. Their study, however, finds inconsistent results when attempting to measure the impact of pension contributions on non-pension wealth and total wealth. In their models, being a contributor, the indicator variable, has a significantly negative coefficient on wealth while the contribution amount, as a continuous variable, does not.

In contrast, an earlier study in Spain by Ayuso, Jimeno et al. (2007) provided evidence that for one dollar contributed to tax-favoured saving accounts, the new saving generated is approximately 25 cents. New saving is measured by changes in consumption rather than household wealth. Moreover, the saving response differs substantially across different age groups. This study utilised a panel dataset from 1985 to 1991 of tax returns from the tax authority and household expenditure. They used the introduction of tax incentives to retirement savings in 1988 as a natural experiment.

[10] The BSP is the compulsory contributions plan which is applied for all employees while SERPS is an additional mandatory pension plan for employees whose earnings are within certain limits.
[11] The survey was conducted in 2010 with 825 respondents.

There has also been evidence that people adjust their pension savings before an anticipated pension tax policy takes place. In Denmark, Kreiner, Leth-Petersen et al. (2017) find that the contributions to employer organised accounts increase by one unit while the contributions to privately held accounts increase by 0.156 units in response to an anticipated tax change. The data was collected from the income Register of the country from 2008 to 2011. The positive coefficient suggests "crowding in" effect between the employer contribution and private contributions, which is understandable in this case because the change in tax incentives applied to both employer contributions and private contributions. The same crowding-in effect may not hold in another context.

Another study from Denmark by Chetty, Friedman et al. (2014) was conducted with 41 million observations from the income tax register, the population register and the Danish Integrated Database for Labour Market Research. This study finds that the majority of people (85%) are passive savers, sticking to the automatic contributions made and having no response to tax subsidies. Only 15% are active savers who switch assets from taxable accounts to tax-subsidised savings accounts. For these active savers, tax subsidised saving crowds out other savings substantially. As such, Chetty, Friedman et al. (2014) concluded that automatic contributions are more efficient in promoting saving than increasing tax subsidies for passive savers.

Overall, the evidence from both Australia and other countries reviewed here are not conclusive in terms of the existence and direction of the substitution effect among pension savings and other forms of savings.

The response to changes in features of an existing tax program such as concession rates and caps

Some studies have a granular focus on the impact of the change in features of an existing program, such as concession rates and contribution caps of these tax-deferred retirement savings accounts. As it is relevant to the question that this report is trying to answer, we present the related literature separately from those that examine the impact of the introduction of a whole new program. The evidence on this from Australia is minimal, and most of this literature is from the US.

Venti and Wise (1991) estimated by simulation that for each $1000 increase in the IRA limit, the families at the current threshold would increase their annual IRA contributions by an average of $856. Also examining IRAs limit, Manegold and Joines (1991) estimate that each dollar increase in IRA limit promotes saving by 26 cents. In contrast, using the interview-based data from the Survey of Consumer Finances (SCF) in 1983 and 1986 of household balance sheets, Gale and Scholz (1994) point out that the increase in IRA contributions limits during the period from 1983 to 1986 has little impact on raising national saving.

Response to non-tax behavioural incentives and nudges

Given various forms of tax concessions and government support, it may seem puzzling why people do not take full advantages of such policies. Numerous studies have drawn attention to people's saving preference and behaviour. These studies provide ample empirical evidence showing that non-tax behavioural incentives or nudges may work well to enhance people's response rate to tax-based incentivisation policies (Hardcastle 2012).

Some examples of non-tax-based incentives are automatic enrolment by employers, the default choice of mySuper account in Australia, employers' matching offer of 401(k)s in the US and the 'Saving Gateway' scheme in the UK. The 'Saving Gateway" initiative targets middle-income earners to help them develop a good saving habit (Hardcastle 2012).

Behavioural nudges such as automatic enrolment, simple default option and auto-choices for passive savers, while allowing people to opt-out, have been seen as very effective in addressing savers' inertia and 'status quo' bias. Madrian and Shea (2001) examine a unique dataset of employees of a large publicly traded firm in the Fortune 500 from 1997 to 1999. Their findings indicate that automatic enrolment in 401(k)s substantially raises household's participation rate in the account.

Some other studies in the US focus on the extent to which using employer matching rate would encourage 401(k) participation and contributions. For example, using a set of administrative data on 1042 individuals who are eligible for 401(k)s in 1991, Engelhardt and Kumar (2007) show that an increase in matching rate by 20 cents per one dollar of employees' contributions leads to a rise in 401(k) participation by five percentage point. They conclude that the 401(k) saving response to matching is quite inelastic, and thus, matching has not shown to be an effective policy instrument to promote retirement saving.

In contrast, using an experiment in which the participants were randomly assigned a match rate of zero (the control group), 20% or 50% to their IRAs, Duflo, Gale et al. (2006) observe that the participation rate and contribution amount to IRAs increase with the match rate. They also find that framing and information presentation could significantly impact saving behaviour. The participants in the study were low and medium earners preparing a tax return at H&R Block in 2005.

There is also peer effect in savings behaviour. Using an experiment with a large manufacturing firm, Beshears, Choi et al. (2015) find that the presence of peer information decreases the saving of those who were ineligible for 401(k) automatic enrolment, and higher observed peer saving rates also decreases saving.

Information about tax-based saving products could be complicated. Therefore, the framing and labelling of policies and professional support may impact people's saving behaviour in response to policies. Card and Ransom (2011) use administrative data collected by Faculty Retirement Survey 1986 – 1997 by TIAA-CREF and find that supplementary retirement saving depends on how the regular pension premium is labelled. In particular, it is susceptible to the share of pension premium labelled as an employee contribution. One dollar of employee contribution leads to a reduction of 60 – 80 cents in supplementary saving, which is twice more than the substitution effect for a dollar classified as an employer contribution. The evidence seems to say that fund members mentally account for employer and employee contributions differently. Tax preparers may play a role in guiding their clients in deciding on how to respond to tax incentives. This evidence is collected from an experiment with 1,416 tax professionals in 2007 by Chetty and Saez (2013).

In summary, non-tax based behavioural nudges, that help simplify information and accessibility of saving programs and reduce the burden of decision making by savers work well to promote savings among passive savers. Passive savers are typically inattentive to tax policies (Friedman 2015).

METHODOLOGY

Econometric models

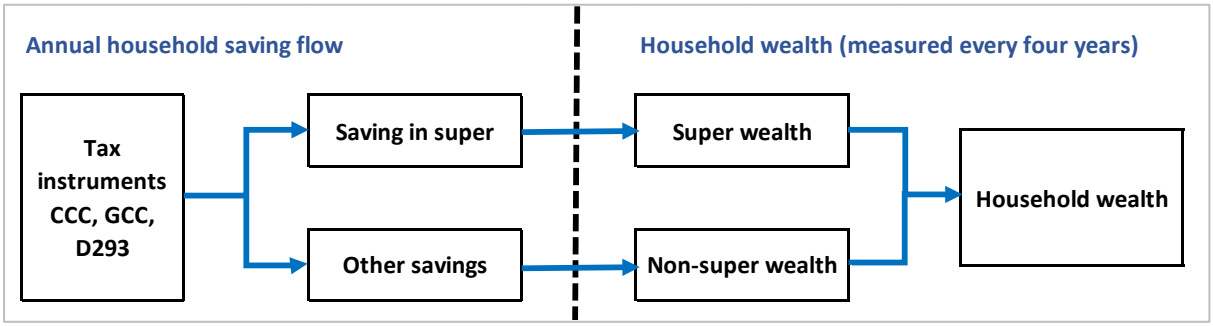

Figure 6: Superannuation tax instruments and household saving(s)

We use a unitary household model to estimate the impact of superannuation tax instruments on household saving and household wealth. Figure 6 illustrates how the effect of a tax instrument on the annual flow of household saving could be linked to its impact on household wealth. While a superannuation tax instrument may have direct effect on the savings in super, it can indirectly affect savings in other forms. The overall effect on wealth depends on the substitutability and complementarity between super and non-super savings. It is, therefore, essential to consider how the policy instrument ultimately affects the total household wealth.

We will use the following measures of superannuation tax policies:

1. GCCOD: A dummy variable taking the value of 1 if any member of the household *i* is eligible for the government co-contribution in year t, and 0 otherwise.

2. GCCODH: A variable indicating the number of members of the household *i* eligible for the government co-contribution in year t.

3. GCCOC: A variable indicating the maximum dollar amount the household *i* can receive if eligible for the government co-contribution in year t.

4. GCCOR: A variable indicating the rate (%) of government co-contribution in year t.

5. CCC: The concessional contribution cap ($) applicable in year t.

6. D293: A dummy variable taking the value of 1 if any member of the household falls in the income bracket subject to the Division 293 tax, 0 otherwise.

We measure the saving of a household *i* in period *t* (s_{it}) as the difference between its total disposable income and expenditure, including rental payment and mortgage repayments, for that particular household in that specific year. It should be noted that the questions on household consumption expenditure in the HILDA survey were not consistent across all the years[12]. While data on non-durables spending is available across the waves from 2005 to 2018, information on durables spending[13] was only collected from 2006 to 2010. To ensure consistency, our measure of household

[12] We use households' annual expenditure data from the Self-completed Questionnaire of the HILDA survey.
[13] Such as computers, motor vehicles, TV and home entertainment systems, furniture, etc.

consumption expenditure consists only of spending on non-durables, rent and mortgages. The trade-off, however, is that with this approach, the total household consumption expenditure would be underestimated; hence, household saving overestimated[14].

A household's saving will depend on its socio-demographic characteristics (for example, age, household size, marital status, occupation, location, income level, etc.) and any policy instrument targeted to influence their saving behaviour– in this case, the tax structure.

$$\boldsymbol{lns_{it}} = \boldsymbol{\alpha_1} + \boldsymbol{\beta_1 T_{it}} + \boldsymbol{\Gamma_1 X_{it}} + \boldsymbol{\theta_i} + \boldsymbol{\gamma_t} + \boldsymbol{\varepsilon_{1it}} \qquad (1)$$

Where, $\boldsymbol{lns_{it}}$ is the log of private household saving, $\boldsymbol{T_{it}}$ is the tax policy, $\boldsymbol{X_{it}}$ is a vector of household economic and demographic characteristics, $\boldsymbol{\theta_i}$ is the unobserved household-specific fixed effect and $\boldsymbol{\gamma_t}$ is the time (wave) fixed effect. Household saving is modelled in the log format as we are more interested in the impact of the policy on the saving rate of households in percentage, rather than the absolute change in dollars.

We control for the following household economic and demographic characteristics - age, gender, education, employment and marital status of the head, log of total disposable income of the household, household size, number of children aged less than or equal to 14 years. We also use dummy variables to control whether the household has an indigenous background with at least one aboriginal or Torres State Islander member, household location (state), the industry of the occupation of the household head, the remoteness of the household, homeownership and financial constraint[15]. The relationship between saving and income, age of the head and household size might be nonlinear. To incorporate the possible nonlinearity, we control for the squares of these variables.

A one-unit change in the tax variable would result in a 100x ($\boldsymbol{e^{\beta_1}}$-1)% change in saving. For a very small $\boldsymbol{\beta_1}$, $(\boldsymbol{e^{\beta_1} - 1}) \approx \boldsymbol{\beta_1}$. For example, for $\boldsymbol{\beta_1 = 0.06}$, $(\boldsymbol{e^{0.06} - 1}) \approx \boldsymbol{0.06}$. Therefore, a one-unit change in the tax incentive would lead to a 6% change in saving.

Following Connolly (2007), we will estimate the impact of tax incentives on household savings using household wealth as a proxy for savings. Using household wealth, which is its net assets, we measure the following relationship.

$$\boldsymbol{W_{it}} = \boldsymbol{\alpha_2} + \boldsymbol{\beta_{21} T_{it}} + \boldsymbol{\beta_{22} T_{it-1}} + \boldsymbol{\beta_{23} T_{it-2}} + \boldsymbol{\beta_{24} T_{it-3}} + \boldsymbol{\Gamma_2 X_{it}} + \boldsymbol{\theta_i} + \boldsymbol{\gamma_t} + \boldsymbol{\varepsilon_{2it}} \qquad (2)$$

We use T in the current period and the previous three periods as well. Since measures of wealth are available in every four years, any change in wealth would be an accumulated response to policies in the current and previous three years. Accordingly, we control for total disposable income in the current year and the past three years instead of only disposable income of the current period. Since the measure of wealth is sensitive to housing prices, we also control for it in Equation (2). All other control variables in $\boldsymbol{X_{it}}$ are the same as in Equation (1).

[14] The final consumption expenditure from the HILDA survey represents only a fraction of the total household final consumption expenditure published by ABS. However, as saving is the dependent variable in our model, any measurement error in saving will not cause any bias in estimating the regression parameters (Wooldridge, 2005).

[15] A household will be classified as a financially constrained household for the year in which the response is "yes" to any of the following questions: having difficulty raising $2000, or $3000 in later HILDA waves, in an emergency; difficulty paying utility bills on time, difficulty paying mortgage/rent on time; having to pawned or sold something; went without meals, was unable to heat home; and asked for financial help from friends and family. We follow the definition used by Connolly (2007).

The main parameters of interest are $\boldsymbol{\beta_1}$, $\boldsymbol{\beta_{21}}$, $\boldsymbol{\beta_{22}}$, $\boldsymbol{\beta_{23}}$ and $\boldsymbol{\beta_{24}}$. We estimate these parameters using the fixed effect (FE) estimators. Under the assumption that the unobserved household fixed effect is uncorrelated with the regressors, both the fixed-effect and the generalised least square (GLS) estimators provide consistent estimates of the model parameters. Even though at first sight, it may appear that $\boldsymbol{T_{it}}$ is a policy instrument and hence is exogenous; in our model, whether a household receives any tax incentives for saving in their superannuation accounts depends on the household fixed effects; and thus the FE estimator would be the more suitable one.

Unlike the saving model, where the dependent variable is log of saving, we run the wealth model in levels as we want to measure the effect of the policy on the level of household wealth. This way the estimated coefficients are economically meaningful and easy to interpret. For example, a change in saving by 1% is easy to understand in terms of magnitude. However, a change in saving by $1 does not convey much information about the magnitude of the effect on saving. For wealth, on the other hand, we find that previous studies have used the regression in level form and the estimated coefficient from the level form regression can easily be interpreted.

One might argue that the relationship between household saving and its determinants may not be linear as households who save and those who don't, have different preferences. Hence the specifications in Equation (1) may suffer from (self) selection bias. In order to overcome such selection bias (if there is any), we will also analyse the impact of tax concessions on private household saving, using a bivariate sample selection model, which includes a probit regression equation for the decision to save, and a generalised linear model (GLM) for the decision about how much to save.

In Equation (3), V is a dummy variable with a value of one for the household that has any saving and zero otherwise. Equation (3) is estimated as a probit model. In Equation (4), the dependent variable is (desired) saving. Let $\boldsymbol{s_{it}}^*$ be households desired saving $\boldsymbol{s_{it}}$ be the actual saving and $\boldsymbol{V_{it}}^*$ be the desire to save.

We specify the sample selection model as follows where Equation (3) is the participation equation and Equation (4) is for the outcome variable:

$$\boldsymbol{V_{it}} = \begin{cases} \boldsymbol{1\ if\ V_{it}}^* > \boldsymbol{0} \\ \boldsymbol{0\ if\ V_{it}}^* \leq \boldsymbol{0} \end{cases} \qquad (3)$$

$$\boldsymbol{s_{it}} = \begin{cases} \boldsymbol{s_{it}}^*\ \boldsymbol{if\ V_{it}} = \boldsymbol{1} \\ \boldsymbol{0\ if\ V_{it}} = \boldsymbol{0} \end{cases} \qquad (4)$$

$\boldsymbol{V_{it}}^*$ and $\boldsymbol{s_{it}}^*$ follow the following processes:

$$\boldsymbol{V_{it}}^* = \boldsymbol{\alpha_1} + \boldsymbol{\Gamma_3 X_{it}} + \boldsymbol{\theta_i} + \boldsymbol{\gamma_t} + \boldsymbol{\varepsilon_{3it}} \qquad (5)$$

$$\boldsymbol{lns_{it}}^* = \boldsymbol{\alpha_1} + \boldsymbol{\beta_4 T_{it}} + \boldsymbol{\Gamma_4 X_{it}} + \boldsymbol{\theta_i} + \boldsymbol{\gamma_t} + \boldsymbol{\varepsilon_{4it}} \quad (6)$$

Under the assumption that the errors in the Equations (5) and (6) are correlated, estimating Equation (5) and (6) separately, will result in the biased and inconsistent estimator of β_4. Using a bivariate sample selection model instead of a Tobit model (Connolly, 2017) is a significant improvement in modelling saving behaviour in the context of Australia as it treats the desire the save and the actual amount of saving as two separate but correlated processes.

Heterogeneous policy effects

The effects of any policy on household behaviour could be heterogeneous. It might differ by their age, education, occupation, location etc. In order to see if the discussed tax policies had any differentiated effects on different groups of households, we run the same analysis by different age cohorts, by different levels of education, by gender of the household head and income. The analysis of heterogeneous policy effects can be done by either splitting the sample into different groups and test if the parameters of interest are different across the regression equations; or we can use a dummy variable approach – using a dummy for each group (for example, by age cohort or by education) and test the significance of the coefficients on the interaction terms.

DATA

We use the Household, Income and Labour Dynamics in Australia Survey (HILDA) for this analysis. It is a household-based longitudinal survey carried out annually since 2001. It follows a multistage clustered sampling method covering 19,914 individuals residing in 7,682 households in wave 1 and 23,237 individuals residing in 9,693 households in wave 18. Missing values on income and wealth-related questions are statistically imputed (Summerfield, Bright et al. 2019)[16]. Therefore, the HILDA longitudinal dataset represents a rich source of data for empirical researchers (Wilkins 2016). HILDA data have been used in both academic, and industry works to examine household wealth and savings[17] (Ryan and Stone (2016), Cobb-Clark, Kassenboehmer et al. (2016) and Cardak and Wilkins (2008)).

The data set covers a wide array of topics ranging from family background, education, employment status, and income, expenditure to wealth, health and retirement. We use wave 5 (in 2005) to wave 18 (2018) HILDA data, collected from HILDA Release 18 – the restricted release version, as it started collecting details of household consumption expenditure only from wave 5.

Our full sample (Table 2) excludes households comprising of multiple unrelated families. Unlike Connolly (2007), we do not exclude households based on any criteria related to age or employment status of household members as these characteristics of a household change over time. These changes provide meaningful variations and transitions of households and can be captured in a panel dataset, which was not possible under the cross-sectional setting of Connolly (2007).

[16] See HILDA User Manual – Release 18 for list of imputed variables and details of statistical imputation methods.
[17] Please see Ryan and Stone (2016) for a comparison between HILDA wealth data and those provided by the ABS's Australian System of National Accounts and the Survey of Income and Housing (SIH).

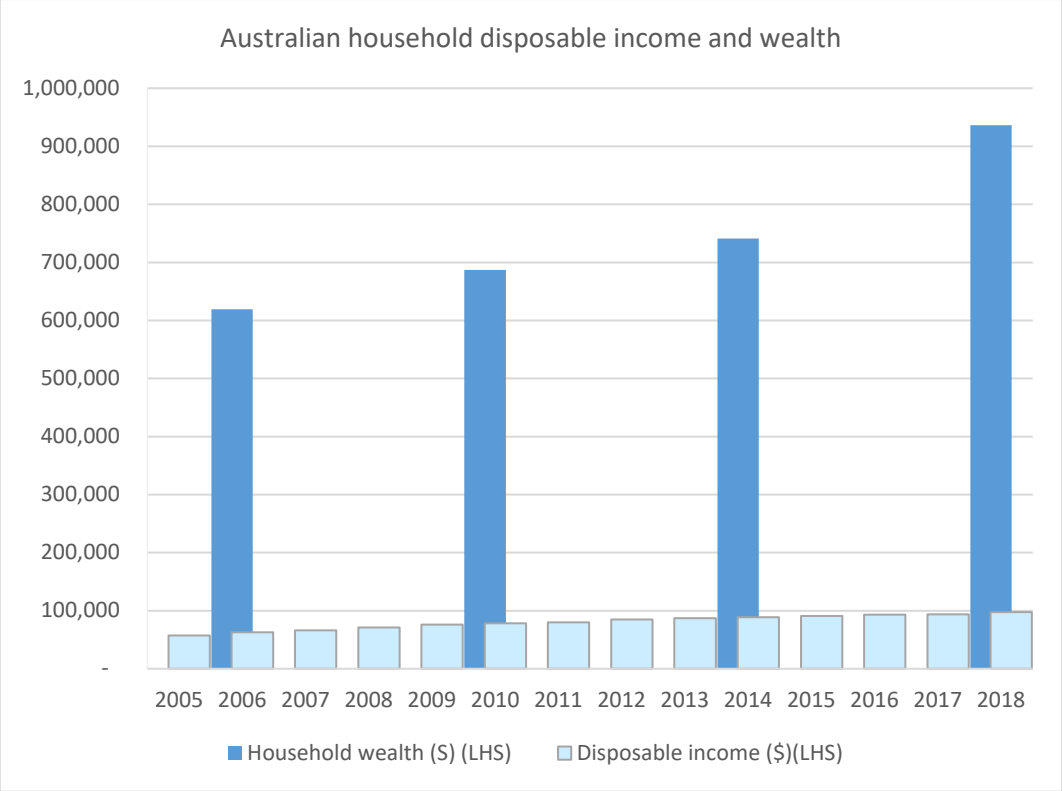

Figure 7: Australian household disposable income and wealth
Source: HILDA data 2002 - 2018

Table 2: Sample description

Wave	Year	HIDLA	Our sample	Per cent	Cum.
5	2005	7,125	6,947	5.95	5.95
6	2006	7,139	6,953	5.95	11.9
7	2007	7,063	6,877	5.89	17.79
8	2008	7,066	6,889	5.9	23.69
9	2009	7,234	7,028	6.02	29.71
10	2010	7,317	7,126	6.1	35.82
11	2011	9,543	9,258	7.93	43.75
12	2012	9,537	9,267	7.94	51.68
13	2013	9,555	9,286	7.95	59.63
14	2014	9,538	9,288	7.95	67.59
15	2015	9,631	9,379	8.03	75.62
16	2016	9,750	9,513	8.15	83.77
17	2017	9,742	9,535	8.17	91.94
18	2018	9,639	9,416	8.06	100
Total		*119,879*	*116,762*	*100%*	

Table 3 presents the economic and demographic characteristics of households relevant for the current analysis.

On average, from 2005 to 2018, the household heads aged from 47 to 50 years. Around 60% of the households had a male head, and approximately 62% to 64% of these household heads classified themselves as married. Households that reported a working head represented 65% to 71% of the total sample in these years. The share of heads with a tertiary degree increased over time from 52% in 2005 to 67% in 2018. The average household size was relatively stable at around 2.5 members, with the average number of children per household slightly decreased from 0.55 to 0.49 during the same period. Households with an indigenous background represented less than 4% of the total. 11 to 12% of the households were located in remote areas. Household disposable income grew by about 71% from $57,237 to $97,612 during the same period.

Approximately 64% of households own their home, including those with mortgages. 48% of households were classified as financially constrained households.

Table 4 presents the share of households affected by the different superannuation tax policies in the HILDA survey.

The Wealth module was introduced into the HILDA survey in wave 2 in 2002 and has been repeated every four years since then. The module covers a full measure of households' assets and liabilities. As Table 5 shows, on average annual household net worth increased at the rates of 11.13%, 2.63%, 1.91% and 6.02% between 2002-2006, 2006-2010, 2010-2014 and 2014-2018 respectively. Non-financial assets consisted of 65-70% of total household assets, and the rests were financial assets held in the form of bank deposits, savings in superannuation, bonds and insurances, etc. The estimates are slightly lower than the mean household wealth estimated by the ABS; however, the trend of wealth growth and assets structure reported by HILDA and ABS are quite similar.

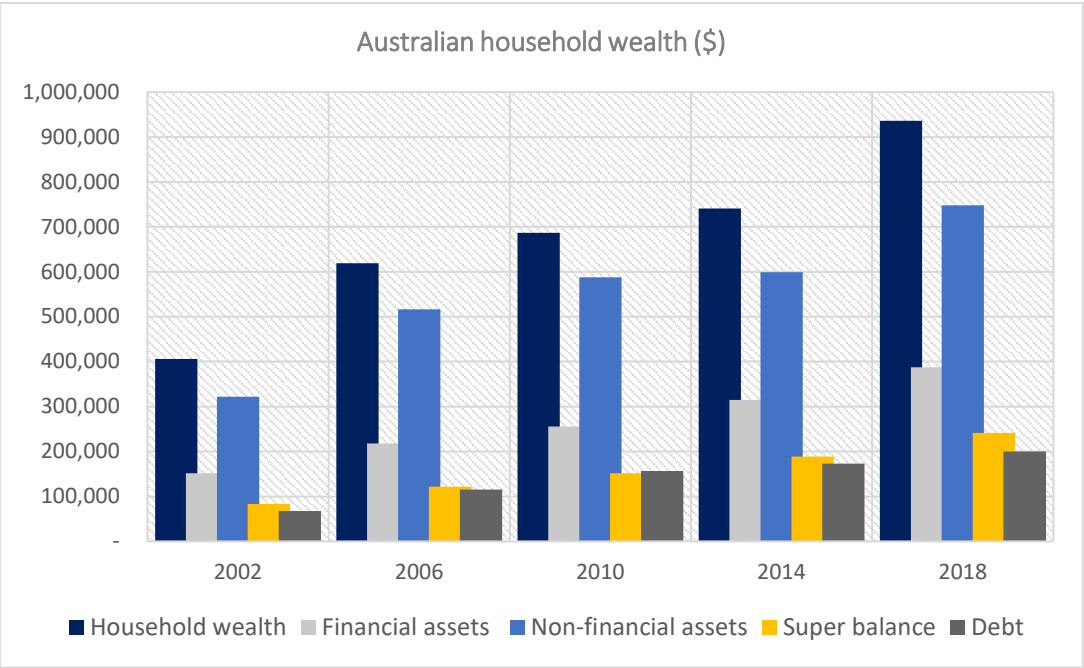

Figure 8: Australian household net worth - Source: HILDA data

The next section presents the results of our estimated regression models.

FINDINGS

Effect of superannuation policies on household private saving

Table 6 presents the fixed effect estimates of the regression equation (1). Columns 1-4 present the impacts of government co-contribution. If a household has a member eligible to receive government co-contribution, the household increases its saving by 0.5% (Column 1). Having one more member eligible for the government co-contribution (GCCODH) increases private household saving by 0.7%. However, these effects are not statistically significant at 5%.

We do not find any significant impact from an increase in the co-contribution cap (GCCOC), or from a change in the rate of government co-contribution (GCCOR). A 1% increase in the rate of government co-contribution increases private saving by only 0.1% among eligible households.

One explanation for this possible complementary relationship is that households eligible for this co-contribution belong to lower-income groups, and most of these households may expect to rely on the Age Pension when they retire. Furthermore, households do not have immediate and easy access to their retirement savings in superannuation before retirement. Therefore, even when the Government offers to match their contributions to superannuation, eligible households may not choose to relocate their private saving from more liquid channels to their superannuation.

Low or non-existent responsiveness of household saving to a matching-based incentive program such as government co-contribution has also been reported in the US (Engelhardt and Kumar 2007). A matching-based incentive policy can work more effectively if coupled with behavioural nudges and supports, such as information presentation and communication (Duflo, Gale et al. 2006).

We also find that the concessional contribution cap does not have a big effect on private household saving. Columns 5-6 show these results. Increasing the cap (CCC) by one dollar reduces private saving by 0.00005%, and increasing the cap by 1% (Ln(CCC)) reduces saving by 0.034%. The decrease in household saving observed when the concessional contributions cap increases could be due to the fact that our saving variable is obtained by subtracting household expenses from disposable income after salary sacrificed superannuation contributions are made. It is plausible that an increase in the concessional contributions cap leads to more concessional contributions such as salary sacrificed contributions, and hence, lowers net saving. The small impact of changes of concessional contributions cap on saving is in line with the literature from the UK on IRA contributions limits (Gale and Scholz 1994).

Division 293 tax reduces private household saving. We find that households subject to this tax reduce their private savings by 12.7% (=100X($e^{0.12}$ – 1)%) (Column 9). These households may experience a decline in their private saving resulting from the added tax payments on superannuation contribution. However, as an additional 15% tax on individual taxable contribution is still less than what these individuals would have to pay had they saved that amount (of excess contribution) outside the superannuation account, the Division 293 tax does not eliminate all incentives for these households to contribute to their super.

We find that the effect of all other determinants of saving is consistent with the theories of intertemporal saving. Household saving declines with the age of the head and household size and increases with income. However, we find evidence that the relationships between saving and the age of the head, income and household size are non-linear. Households that own their homes save

less. Financially constrained households also save less; however, the effects are not statistically significant.

Heterogeneous effect of superannuation policies

We find evidence of significant heterogeneity in the effects of these tax policies on household saving. As Table 7 shows, married households save (5.2%) less than households with unmarried heads. This is the case for all the concessional tax policies analysed in this report.

Similarly, the policy responses vary by the education level of the household head. Compared to households with heads with lower education, households with heads who have a diploma save 1.9% more when the household is eligible for government co-contribution and by 1.4% more if they have one more member eligible for government co-contribution. These households, however, save less in response to an increase in the cap of concessional contribution, even though the magnitude of this difference is minimal. We find that the impact of the government co-contribution does not vary by the age of the head, or his/her labour force status.

The savings behaviour of households also varies by income. Compared to those in the lower-income quantile, households in the 3rd and 4th quantiles save more if they have a member eligible for government co-contribution, but these differences are not statistically significant at 5%. These households save less when the concessional contribution cap increases by $1 compared to those in the 1st quantile. However, the magnitudes of these effects are very small.

We do not find any significant heterogeneity in the effect of Division 293 tax on household saving, except by marital status and age of the household heads. Households with married heads save more, and those with older heads save less when they are liable for paying the Division 293 tax.

Effect of superannuation policies on household wealth

Table 8 presents the results for Equation (2). The effects of the tax policies on household wealth appear to be very marginal in magnitude.

We do not find any significant impact of eligibility for government co-contribution on household wealth. However, for households who are eligible for such co-contribution, both increases in the co-contribution cap and co-contribution rate improve household wealth (column 3 and 4). A 1% increase in the government co-contribution rate boosts household wealth by $345 contemporaneously.

The change in concessional contributions cap does not significantly affect household wealth (column 5); however, the coefficient at one lag of the variable is weakly significant and positive, meaning that the change in the cap could have some delayed positive impact on household wealth. In order to see if this cap affects households who contribute more (near or above the cap) in a different way than those who contribute far below the cap, we restrict our analysis to only households in the highest contribution group. These households are identified as those in the 85th percentile of the distribution of the change in superannuation balance in every four years, which is equivalent to an increase of at least $108,000 in such time In the absence of data on the specific rate of return earned by these households' super in each year, it is reasonable to assume that households with the largest change in the super balance are those contributing more to their super. We find that for these group of high contributors, changing the cap has no effect on their wealth as is shown in column 6 of Table 8.

D293 households have significantly more wealth than non-D293 households, which should be expected as D293 households belong to the high-income group. To identify how the introduction of the Division 293 tax actually affects the wealth of these households, we also conduct an analysis similar to the regression discontinuity design on a subsample of households with individuals earning at least $240,000, marginally lower than the applicable Division 293 threshold ($250,000). The regression discontinuity design allows us to compare the wealth of households who are liable for the Division 293 tax to those who are just barely not, controlling for all other household characteristics. We do not find any evidence that the D293 households are worse off because of the tax policy[18]. The results are presented in column 8 of Table 8.

To examine the disaggregated impact of these policy instruments, as an expanded analysis, we divide wealth into super and non-super wealth, all in dollar terms. We do not find any negative impact of such instruments on non-super wealth.

Table 9 presents the effects of these policies on household's superannuation balance. It shows the results for Equation (2) where we replace the dependent variable by the dollar amount of the household superannuation balance. All these policies have a net positive effect on households' superannuation account balance. For example, an increase of 1% in the government co-contribution rate leads to $9.72 contemporaneous increase in households' superannuation balance. While the magnitude of the change in the superannuation balance is not large, it is statistically significant, suggesting some level of positive response to the policy.

Similar to the estimate by Manegold and Joines (1991) for the UK that each dollar increase in IRA limit promotes savings by 26 cents, we find that a $1 increase in the concessional contributions cap leads to a 25-cent change in the superannuation balance contemporaneously, though, it is insignificant. The change in the cap, however, is strongly significant for one of its lagged terms, implying that there may be some delayed response to the policy changes. In other words, these tax instruments are marginally effective in promoting superannuation savings. However, when we run this regression for the households whose contribution is in the 85th percentile, we find that the net effect is close to zero (column 6).

Similarly, the Division 293 tax also do not have any significant effect on the superannuation wealth of households in the higher income group (column 8).

Table 10 presents the effects of these tax instruments on non-super wealth when we replace the dependent variable in Equation (2) by the dollar amount of the household non-super wealth. None of the coefficients of the tax policy variables and their lags is statistically significant except for the Division 293 tax (column 7). However, when we restrict the sample to households where the highest earning member's income is more than or equal to $240,000 p.a., i.e., the level of income marginally lower than the Division 293 tax threshold, , we find no effect of the policy on household's non-super wealth (column 7).

It should be noted that despite some immediate positive impacts of these policies on wealth and superannuation balance, the overall effects of these policies – summed over the four years, are not statistically significant except for the effect of concessional contributions cap on superannuation balance for the whole sample– as implied by the F-test statistics. Additionally, our analysis of the

[18] This might seem confusing at the first glance as our results from Table 6 shows that households who pay the Division 293 tax have significantly lower saving than those who do not pay this tax. It should be mentioned that when we run the saving regression (Eq(1)) for this subsample of households (income of any member >=$240,000) we find that the effect of this tax on net private household saving is not statistically significant.

government co-contribution policy relies on income-based eligibility of the household member and do not reflect if they actually take advantage of the concessional policy. If these households do not make personal contributions to their superannuation accounts, either because they are not aware of the policy or underestimate the importance of saving for retirement, then the estimated impact of this policy would be lower than its potential. However, such information is not available in HILDA.

The sample selection model

Estimates of the sample selection model for net private household saving are presented in Table 11. We use both the FIML and Heckman two-step estimation method. Both the FIML and two-step methods reject the null hypothesis that the errors in the two equations (5 and 6) are uncorrelated except for the Division 293 tax and the estimated coefficients are similar in magnitude. We present the two-step estimation results here as the two-step method requires less stringent assumption than the maximum likelihood estimates. The policy effects of different concessional taxes on household saving are similar to those presented in Table 6 except for the concessional contribution cap; however, the magnitudes and the statistical significance of the parameters are different. Column 1 presents the results for the participation equation (equation (5)) and columns 2-7 present the GLS estimates of the saving equation (6). The coefficient of Lambda is statistically significant in the first five models implying that the in errors in Equations (5) and (6) are correlated.

We find that households who are eligible for government co-contribution save 1.2% more than those who are not, they also increase their saving as more members become eligible for such co-contribution. Increasing the concessional contribution cap has a significant positive effect on household saving. The magnitude of this effect is very small (0.0001%). We find a strong negative effect of Division 293 tax. Households who are in this tax bracket reduce their private saving by 8.8% compared to those who are not subject to the tax.

Heckman sample selection model and the FE model deals with two different types of bias in estimating a regression relationship. Our estimates of the Heckman sample selection model implies that there is selection based on the dependent variable (Log of saving), i.e., to say those who have positive amounts of saving behave differently than those who have non-positive saving. However, the estimates from this model fail to account for the bias caused by unobserved household-specific heterogeneity as it measures the saving equation by GLS. Therefore, the FE estimates and the Heckman estimates may differ from each other.

Table 12 provides a summary of the key findings from all models.

CONCLUSION

The objective of a concessional policy targeting retirement savings is to encourage people to direct additional income into savings accounts earmarked for retirement. The contributions to retirement savings accounts in response to such policies may be sourced from savings in other vehicles. However, as long the as the substitution rate is less than one, the concessional policy could be claimed to have served its purpose. The policy is effective in raising savings for retirement as superannuation savings are difficult to access before retirement. When savings are held in other vehicles, the temptation to spend is always there.

We find that the concessional policies have little impact on the superannuation balances of households, and also on other forms of savings. The government co-contribution boosts household superannuation balance and wealth only marginally without any significant adverse effect on non-

super wealth. Households substitute some private saving with superannuation saving when the concessional contribution cap increases. However, the overall effect of this cap on household wealth is very small.

The Division 293 tax reduces private household saving on a full-sample analysis. However, when these D293 households are compared to those with income marginally below the Division 293 threshold, such effect disappears. It does not have any effect on wealth or superannuation balance either when compared to the non-D293 households earning similar income.

We, therefore, conclude that the effect of the superannuation policies on savings in super, and other forms of household savings is very small. Additionally, we find no adverse effects of such policies on household saving behaviour and wealth.

Over the long run, the issue of whether the response to these policies represents new savings or just a reallocation of assets depends on how they are designed within a broader system of policies that address disposable income, consumption and private saving. As found in previous research, tax incentives/disincentives can work better when coupled with non-tax based and targeted behavioural incentives.

Table 1: Relevant superannuation and concession rates and thresholds

Income Year	SG	Max. super contribution base	Super Surcharge			Concessional contribution cap ($) of different age groups				Non concessional contribution cap	Government co-contributions			Divison 293 Income tax (15%)
			Max surcharge rate	Lower income threshold	Higher income threshold	<35 yrs	<50 yrs	<50 yrs	≥ 50 yrs		Cap	Lower income threshold	Higher income threshold	
2000/2001	8.00%	$26,300	15%	$81,493	$98,955									n/a
2001/2002	8.00%	$27,510	15%	$85,242	$103,507									n/a
2002/2003	9.00%	$29,220	15%	$90,527	$109,924									n/a
2003/2004	9.00%	$30,560	14.50%	$94,691	$114,981						$1,000	$27,500	$40,000	n/a
2004/2005	9.00%	$32,180	12.50%	$99,710	$121,075	$13,934	$30,702	$95,980			$1,500	$28,000	$58,000	n/a
2005/2006	9.00%	$33,720	n/a	n/a	n/a	$14,603	$40,560	$100,587			$1,500	$28,000	$58,000	n/a
2006/2007	9.00%	$35,240	n/a	n/a	n/a	$15,260	$42,385	$105,113			$1,500	$28,000	$58,000	n/a
2007/2008	9.00%	$36,470	n/a	n/a	n/a	$50,000		$100,000		$150,000	$1,500	$28,980	$58,980	n/a
2008/2009	9.00%	$38,180	n/a	n/a	n/a	$50,000		$100,000		$150,000	$1,500	$30,342	$60,342	n/a
2009/2010	9.00%	$40,170	n/a	n/a	n/a	$25,000		$50,000		$150,000	$1,000	$31,920	$61,920	n/a
2010/2011	9.00%	$42,220	n/a	n/a	n/a	$25,000		$50,000		$150,000	$1,000	$31,920	$61,920	n/a
2011/2012	9.00%	$43,820	n/a	n/a	n/a	$25,000		$50,000		$150,000	$1,000	$31,920	$61,920	n/a
2012/2013	9.00%	$45,750	n/a	n/a	n/a	$25,000				$150,000	$500	$31,920	$46,920	$300,000
						<35 yrs	<49 yrs	<59 yrs	≥ 59 yrs					
2013/2014	9.25%	$48,040	n/a	n/a	n/a	$25,000			$35,000	$150,000	$500	$33,516	$48,516	$300,000
2014/2015	9.50%	$49,430	n/a	n/a	n/a	$30,000		$35,000		$180,000	$500	$34,488	$49,488	$300,000
2015/2016	9.50%	$50,810	n/a	n/a	n/a	$30,000		$35,000		$180,000	$500	$35,454	$50,454	$300,000
2016/2017	9.50%	$51,620	n/a	n/a	n/a	$30,000		$35,000		$180,000	$500	$36,021	$51,021	$300,000
2017/2018	9.50%	$52,760	n/a	n/a	n/a	$25,000				$100,000	$500	$36,813	$51,813	$250,000
2018/2019	9.50%	$54,030	n/a	n/a	n/a	$25,000				$100,000	$500	$37,697	$52,697	$250,000
2019/2020	9.50%	$55,270	n/a	n/a	n/a	$25,000				$100,000	$500	$38,564	$53,564	$250,000

Source: Thresholds and rates collected from the ATO's website

Table 2: Sample description

Wave	Year	HIDLA	Our sample	Per cent	Cum.
5	2005	7,125	6,947	5.95	5.95
6	2006	7,139	6,953	5.95	11.9
7	2007	7,063	6,877	5.89	17.79
8	2008	7,066	6,889	5.9	23.69
9	2009	7,234	7,028	6.02	29.71
10	2010	7,317	7,126	6.1	35.82
11	2011	9,543	9,258	7.93	43.75
12	2012	9,537	9,267	7.94	51.68
13	2013	9,555	9,286	7.95	59.63
14	2014	9,538	9,288	7.95	67.59
15	2015	9,631	9,379	8.03	75.62
16	2016	9,750	9,513	8.15	83.77
17	2017	9,742	9,535	8.17	91.94
18	2018	9,639	9,416	8.06	100
Total		*119,879*	*116,762*	*100%*	

Table 3: Household Economic and Demographic Characteristics

Variable	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9	Wave 10	Wave 11	Wave 12	Wave 13	Wave 14	Wave 15	Wave 16	Wave 17	Wave 18
Age of head (years)	47.7	47.73	47.87	47.67	47.95	48.16	49.17	49.26	49.39	49.36	49.51	49.61	49.99	49.91
	0.31	*0.3*	*0.3*	*0.28*	*0.28*	*0.28*	*0.29*	*0.29*	*0.31*	*0.3*	*0.3*	*0.29*	*0.3*	*0.28*
Head is male	62%	61%	61%	62%	61%	61%	61%	61%	60%	60%	61%	60%	59%	59%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Married	63%	63%	63%	63%	63%	63%	64%	64%	64%	64%	63%	63%	63%	62%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Head is working	69%	70%	71%	70%	71%	71%	70%	70%	70%	70%	70%	69%	69%	69%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Tertiary education	55%	57%	57%	58%	59%	59%	62%	63%	64%	65%	66%	66%	67%	67%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Household size	2.51	2.51	2.52	2.51	2.52	2.52	2.5	2.49	2.48	2.49	2.48	2.47	2.48	2.48
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
No. of children	0.53	0.52	0.52	0.52	0.51	0.51	0.5	0.51	0.5	0.5	0.5	0.49	0.5	0.49
	0.02	*0.01*	*0.01*	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
Indigenous	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
	0%	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Homeownership	67%	67%	67%	67%	67%	67%	65%	65%	64%	64%	64%	64%	64%	64%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Financially constrained	51%	49%	47%	46%	49%	47%	51%	50%	49%	50%	48%	50%	48%	48%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Remoted	11%	12%	11%	11%	11%	11%	12%	12%	12%	12%	11%	11%	11%	11%
	1%	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*	*1%*
Income ($)	57,237	62,997	66,252	71,019	75,967	78,028	79,914	84,795	87,044	88,760	90,688	92,944	93,656	97,612
	899	*1225*	*1113*	*1234*	*1126*	*1202*	*1127*	*1303*	*1237*	*1276*	*1244*	*1555*	*1483*	*1478*
N	6627	6665	6572	6602	6766	6831	8889	8898	8898	8931	8998	9130	9144	9055

Notes: We define the head of the household as the person with the highest disposable income in that household. If two or more members of the households have the same disposable income, then the oldest among them is considered as the head. If more than one member has the same disposable income and the same age, then the one higher educational qualification among them is treated as the head. Mean and standards errors are in the first and second rows respectively for each variable. We use the HILDA survey structures and prescribed weight for each round in calculating the mean and standard errors.

Table 4: Policy variables at the household level

Variable	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9	Wave 10	Wave 11	Wave 12	Wave 13	Wave 14	Wave 15	Wave 16	Wave 17	Wave 18
Division 293 taxed									1.48%	1.79%	2.20%	2.06%	2.13%	3.36%
									0.15%	0.17%	0.25%	0.19%	0.18%	0.24%
Eligible for government co-contribution (%)	47.64%	48.09%	47.64%	46.64%	45.09%	44.82%	43.11%	43.60%	23.24%	23.72%	22.56%	23.69%	21.95%	21.45%
	0.79%	0.75%	0.73%	0.70%	0.75%	0.69%	0.63%	0.70%	0.61%	0.58%	0.64%	0.61%	0.64%	0.72%
N	6947	6953	6877	6889	7028	7126	9258	9267	9286	9288	9379	9513	9535	9416

Note: Mean and standards errors are in the first and second rows respectively for each variable. We use the HILDA survey structures and prescribed weight for each round in calculating the mean and standard errors.

Table 5: Household Wealth

$	Wave 2	Wave 6	Wave 10	Wave 14	Wave 18
Bank accounts	23,774.89	29,932.88	40,571.60	51,705.60	70,241.63
	1,246.30	*1,530.77*	*2,151.82*	*2,363.44*	*3,509.95*
Equity investments	32,425.34	47,290.62	38,644.01	44,071.00	43,643.51
	2,239.72	*3,751.44*	*2,983.18*	*3,570.70*	*2,816.61*
Super balance	83,444.28	121,973.18	151,943.15	189,068.73	241,190.42
	3,151.88	*4,854.43*	*6,627.34*	*6,144.02*	*7,284.24*
Cash investments	2,081.58	2,481.25	1,973.62	1,927.03	1,254.29
	301.14	*523.47*	*390.35*	*404.41*	*267.80*
Trust investments	5,029.84	8,797.97	11,489.48	13,003.76	19,393.17
	1,093.98	*2,339.07*	*2,022.59*	*1,692.44*	*3,283.15*
Life insurance	5,012.78	7,264.47	11,394.88	15,158.24	12,146.68
	524.44	*1,076.24*	*1,543.01*	*1,862.22*	*1,486.14*
Property	258,507.10	440,510.99	507,724.74	530,818.70	668,693.56
	8,876.31	*19,664.48*	*13,789.84*	*12,942.14*	*16,641.68*
Business assets	41,239.75	49,508.30	50,739.33	37,653.20	44,644.00
	4,746.93	*4,646.76*	*5,111.72*	*4,077.47*	*4,931.64*
Other assets	22,098.09	26,477.91	29,411.40	30,363.87	35,014.14
	785.88	*875.93*	*837.21*	*784.22*	*1,017.07*
Financial assets	151,768.72	217,740.36	256,016.73	314,934.36	387,869.70
	5,819.97	*8,648.92*	*10,651.05*	*10,582.55*	*12,173.17*
as % of total assets	*32.0%*	*29.7%*	*30.3%*	*34.5%*	*34.1%*
Non-financial assets	321,844.93	516,497.20	587,875.46	598,835.77	748,351.70
	11,868.82	*22,425.14*	*16,949.18*	*15,235.25*	*19,157.19*
as % of total assets	*68.0%*	*70.3%*	*69.7%*	*65.5%*	*65.9%*
Total assets	473,613.65	734,237.56	843,892.19	913,770.12	1,136,221.41
	16,075.77	*28,046.91*	*24,967.97*	*22,992.16*	*28,426.17*
Total debt	67,728.63	115,081.09	156,913.63	172,802.32	199,970.16
	2,272.42	*4,057.68*	*5,133.04*	*5,508.83*	*6,831.99*
Household wealth	405,885.02	619,156.47	686,978.57	740,967.81	936,251.25
	14,766.50	*25,773.65*	*22,699.13*	*20,697.09*	*25,587.09*
Annual growth from previous wave		*11.13%*	*2.63%*	*1.91%*	*6.02%*
N	7,051	6,953	7,126	9,288	9,416

Notes: Mean and standards errors are in the first and second row respectively for each variable. We use the HILDA survey structures and prescribed weight for each round in calculating the mean and standard errors.

Table 6: Effects of Concessional Tax Policies on Household Saving (Fixed effect estimates)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	GCCOD	GCCODH	GCCOC if GCCOD==1	GCCOR if GCCOD==1	CCC	Ln(CCC)	D293
Policy	0.005	0.007*	0.000	0.001	-0.0000005***	-0.034***	-0.120***
	(0.005)	(0.004)	(0.000)	(0.000)	(0.000)	(0.009)	(0.029)
Income	4.979***	4.970***	6.871***	6.888***	4.986***	5.156***	5.797***
	(0.095)	(0.095)	(0.302)	(0.299)	(0.094)	(0.098)	(0.162)
Income squared	-0.138***	-0.137***	-0.216***	-0.216***	-0.138***	-0.145***	-0.171***
	(0.004)	(0.004)	(0.013)	(0.013)	(0.004)	(0.004)	(0.007)
Age of head	-0.011***	-0.011***	-0.024***	-0.024***	-0.009***	-0.015***	-0.012***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Age squared	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head is male	-0.003	-0.003	-0.012	-0.012	-0.002	-0.005	-0.007
	(0.007)	(0.007)	(0.011)	(0.011)	(0.007)	(0.007)	(0.010)
Head is married	-0.067***	-0.067***	-0.123***	-0.123***	-0.069***	-0.070***	-0.044***
	(0.010)	(0.010)	(0.017)	(0.017)	(0.010)	(0.010)	(0.016)
Head is working	-0.044***	-0.044***	-0.024	-0.024	-0.043***	-0.038***	-0.065***
	(0.013)	(0.013)	(0.021)	(0.021)	(0.013)	(0.013)	(0.018)
Education	-0.019**	-0.019**	0.011	0.011	-0.019**	-0.018*	-0.020
	(0.009)	(0.009)	(0.015)	(0.015)	(0.009)	(0.009)	(0.015)
HH size	-0.072***	-0.072***	-0.110***	-0.110***	-0.069***	-0.069***	-0.085***
	(0.011)	(0.011)	(0.018)	(0.018)	(0.011)	(0.011)	(0.019)
HH size squared	0.005***	0.005***	0.008***	0.008***	0.005***	0.005***	0.010***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)
No of children	-0.042***	-0.041***	-0.035***	-0.035***	-0.044***	-0.040***	-0.056***
	(0.006)	(0.006)	(0.010)	(0.010)	(0.006)	(0.006)	(0.011)
Indigenous	0.072**	0.071**	0.085*	0.085*	0.070**	0.062*	-0.014
	(0.032)	(0.032)	(0.051)	(0.051)	(0.032)	(0.032)	(0.053)
Homeownership	-0.128***	-0.128***	-0.178***	-0.178***	-0.127***	-0.143***	-0.103***
	(0.008)	(0.008)	(0.015)	(0.015)	(0.008)	(0.009)	(0.014)
Financial constraint	-0.003	-0.003	-0.001	-0.001	-0.003	-0.007	-0.009
	(0.006)	(0.006)	(0.010)	(0.010)	(0.006)	(0.006)	(0.008)
Observations	93,242	93,242	33,365	33,365	93,242	87,611	46,051
R-squared	0.569	0.569	0.511	0.511	0.569	0.579	0.561
Number of id	12,985	12,985	9,070	9,070	12,985	12,696	10,806
HH FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All models include time fixed effects, state, industry and location dummies. But we do not report their coefficients for brevity.

Table 7: Heterogeneous effects of Tax policies on saving by demographic characteristics (FE estimates)

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD=1	(4) GCCOR if GCCOD=1	(5) CCC	(6) D293
Policy	0.051**	0.045**	0.000***	0.003***	-0.000***	-0.447***
	(0.025)	(0.022)	(0.000)	(0.001)	(0.000)	(0.115)
Income	4.129***	4.113***	5.224***	5.384***	4.024***	5.313***
	(0.111)	(0.111)	(0.349)	(0.359)	(0.079)	(0.189)
Income squared	-0.107***	-0.106***	-0.151***	-0.157***	-0.108***	-0.151***
	(0.005)	(0.005)	(0.015)	(0.015)	(0.003)	(0.008)
Age of head	-0.009***	-0.009***	-0.021***	-0.016***	-0.001	-0.013***
	(0.002)	(0.002)	(0.004)	(0.004)	(0.001)	(0.003)
Age of head squared	0.000***	0.000***	0.000***	0.000***	-0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head is male	-0.003	-0.000	-0.004	-0.031	0.004	-0.007
	(0.008)	(0.008)	(0.019)	(0.024)	(0.008)	(0.010)
Head is married	-0.040***	-0.047***	-0.114***	-0.035	-0.019*	-0.049***
	(0.011)	(0.011)	(0.027)	(0.033)	(0.010)	(0.016)
Head is working	-0.053***	-0.046***	-0.043***	-0.052***	-0.025	-0.068***
	(0.017)	(0.016)	(0.015)	(0.016)	(0.020)	(0.018)
Education	-0.031***	-0.030***	0.023	0.054**	0.005	-0.021
	(0.011)	(0.011)	(0.021)	(0.026)	(0.010)	(0.015)
HH size	-0.075***	-0.075***	-0.081***	-0.075***	-0.099***	-0.094***
	(0.011)	(0.011)	(0.019)	(0.019)	(0.008)	(0.019)
HH size squared	0.005***	0.005***	0.005**	0.005**	0.005***	0.011***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
No of children	-0.036***	-0.036***	-0.036***	-0.035***	0.004	-0.053***
	(0.006)	(0.006)	(0.010)	(0.010)	(0.005)	(0.011)
Homeownership	-0.133***	-0.133***	-0.177***	-0.176***	-0.067***	-0.105***
	(0.009)	(0.009)	(0.015)	(0.015)	(0.007)	(0.014)
Financial constraint (FC)	0.002	0.002	0.009	0.009	0.020***	-0.009
	(0.006)	(0.006)	(0.010)	(0.010)	(0.005)	(0.008)
Income quantile 2	0.100***	0.103***	0.155***	0.112***	0.105***	0.055***
	(0.014)	(0.014)	(0.041)	(0.042)	(0.012)	(0.017)
Income quantile 3	0.202***	0.206***	0.282***	0.205***	0.158***	0.108***
	(0.018)	(0.018)	(0.044)	(0.049)	(0.015)	(0.024)
Income quantile 4	0.270***	0.274***	0.293***	0.196***	0.139***	0.109***
	(0.021)	(0.021)	(0.048)	(0.056)	(0.018)	(0.029)
indigenous	0.065*	0.068**	0.094	0.104	-0.006	-0.018
	(0.035)	(0.035)	(0.062)	(0.071)	(0.032)	(0.053)
Policy*Education	0.019*	0.014*	-0.000	-0.000**	-0.000**	-0.014
	(0.011)	(0.008)	(0.000)	(0.000)	(0.000)	(0.070)
Policy*age group 2	-0.014	-0.002	-0.000	-0.001***	0.000***	-0.080
	(0.011)	(0.008)	(0.000)	(0.000)	(0.000)	(0.059)
Policy*age group 3	-0.001	-0.008	-0.000***	-0.002***	0.000***	-0.265***
	(0.018)	(0.015)	(0.000)	(0.000)	(0.000)	(0.091)
Policy*Head is male	0.009	0.002	0.000	0.000	0.000	0.046
	(0.010)	(0.008)	(0.000)	(0.000)	(0.000)	(0.054)
Policy*Head is married	-0.052***	-0.029***	0.000	-0.001***	-0.000***	0.191***
	(0.013)	(0.010)	(0.000)	(0.000)	(0.000)	(0.067)
Policy*Head is working	0.022	0.003	-0.000	0.000	0.000	0.131
	(0.025)	(0.018)	(0.000)	(0.000)	(0.000)	(0.096)
Policy*income quantile 2	0.023	0.016	-0.000	-0.000	-0.000***	0.000
	(0.020)	(0.019)	(0.000)	(0.000)	(0.000)	(0.000)
Policy*income quantile 3	0.035	0.018	-0.000**	-0.000	-0.000***	0.000
	(0.021)	(0.020)	(0.000)	(0.000)	(0.000)	(0.000)
Policy*income quantile 4	0.036	0.020	-0.000**	0.000	-0.000	0.000

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD=1	(4) GCCOR if GCCOD=1	(5) CCC	(6) D293
	(0.022)	(0.020)	(0.000)	(0.000)	(0.000)	(0.000)
Policy*Indigenous	0.009	0.003	-0.000	-0.000	0.000*	-0.192
	(0.026)	(0.020)	(0.000)	(0.001)	(0.000)	(0.206)
Observations	93,242	93,242	33,365	33,365	100,089	46,051
R-squared	0.566	0.566	0.502	0.503	0.628	0.562
Number of id	12,985	12,985	9,070	9,070	13,264	10,806
HH FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All models include time fixed effects, state, industry and location dummies. But we do not report their coefficients for brevity.

Table 8: *Effects of Concessional Tax Policies on Household Wealth*

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD=1	(4) GCCOR if GCCOD=1	(5) CCC	(6) CCC (85th percentile)	(7) D293	(8) D293 (RDD[a])
Policy	17,350.12	15,428.107	22.176**	345.156**	-0.185	-2.757	652,146.128***	186,033.909
	(13,247.273)	(10,822.256)	(11.176)	(158.592)	(0.527)	(4.065)	(47,468.086)	(253,337.744)
L1	-17,372.174	-12,316.365	-4.229	-51.422	0.107	-0.446	143,226.484**	258,070.327
	(13,128.267)	(10,537.019)	(9.020)	(129.481)	(0.467)	(3.109)	(59,836.822)	(295,615.881)
L2	-3,286.46	-3,471.110	-1.648	77.217	1.039*	-3.846	383,460.381***	41,898.498
	(14,268.377)	(11,285.851)	(10.086)	(141.023)	(0.559)	(4.699)	(75,843.554)	(385,652.513)
L3	-2,074.44	-3,096.118	-11.348	-123.475	-0.002	1.646	416,741.333***	8,440.673
	(13,958.238)	(11,027.150)	(10.031)	(142.393)	(0.361)	(3.627)	(74,692.369)	(372,291.699)
Income	1.158***	1.159***	1.027***	1.022***	1.150***	1.274***	0.819***	1.643***
	(0.048)	(0.048)	(0.063)	(0.063)	(0.048)	(0.186)	(0.051)	(0.432)
Income squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age of head	8,186.370**	8,261.592**	-8,236.438*	-8,416.059**	5,977.968	-32,383.304	8,541.053***	-174,785.903**
	(3,287.930)	(3,298.274)	(4,300.834)	(4,286.543)	(3,757.121)	(32,405.055)	(3,231.081)	(82,031.793)
Age squared	-49.187	-50.048	135.643***	137.681***	-25.482	479.505	-57.388*	1,721.369**
	(32.312)	(32.399)	(44.440)	(44.323)	(37.345)	(325.197)	(31.765)	(794.003)
Head is male	11,226.516	11,117.404	-6,744.059	-6,856.353	11,672.362	719.452	11,513.934	-332,837.620
	(16,208.437)	(16,208.618)	(18,588.494)	(18,589.511)	(16,225.853)	(96,507.283)	(16,013.129)	(337,305.702)
Head is married	31,936.711	32,302.254	12,841.751	12,886.723	31,972.223	66,908.238	43,785.525*	2199471.902***
	(23,071.240)	(23,081.353)	(27,162.490)	(27,134.609)	(23,125.214)	(152,756.111)	(22,798.801)	(723,387.420)
Head is working	-23,090.214	-23,327.426	-28,049.026	-28,958.774	-19,913.481	156,649.454	-26,672.569	458,564.270
	(30,946.234)	(30,938.095)	(35,383.209)	(35,383.679)	(30,935.055)	(183,414.474)	(30,552.919)	(450,281.929)
Education	-60,425.267***	-60,140.303***	-69,186.754***	-69,317.365***	-59,903.510***	-196,438.356	-54,571.267**	-465,836.751
	(21,673.449)	(21,672.287)	(24,265.527)	(24,266.828)	(21,668.524)	(148,874.193)	(21,416.584)	(852,774.969)
Household size	109,433.720***	108,375.458***	76,438.077***	78,281.980***	110,454.515***	10,340.279	124,740.641***	-95,025.136
	(23,244.480)	(23,256.589)	(25,691.508)	(25,658.628)	(23,287.496)	(139,554.249)	(22,941.953)	(476,408.471)
Household size squared	-11,188.016***	-11,136.605***	-7,264.676**	-7,282.734**	-11,223.606***	2,238.858	-12,531.201***	8,043.385

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD=1	(4) GCCOR if GCCOD=1	(5) CCC	(6) CCC (85th percentile)	(7) D293	(8) D293 (RDD[a])
	(3,221.012)	(3,220.138)	(3,435.748)	(3,434.570)	(3,220.841)	(19,533.070)	(3,181.402)	(61,643.660)
No. of children	-30,555.365**	-30,123.666**	-21,544.167	-22,742.531*	-29,354.297**	26,962.447	-34,495.606***	194,890.116
	(11,907.650)	(11,935.034)	(13,573.566)	(13,519.113)	(11,958.982)	(54,748.148)	(11,758.263)	(153,710.428)
Indigenous	-72,779.746	-72,349.143	-36,897.976	-37,416.890	-71,539.461	1013714.434	-61,056.807	4070311.392
	(78,017.593)	(78,013.947)	(85,681.217)	(85,693.420)	(77,983.888)	(866,163.480)	(77,069.076)	(2559629.907)
Remoteness	23,463.866	23,636.153	17,359.004	16,605.592	23,206.707	233,261.42**	22,575.523	1173215.772**
	(17,908.957)	(17,906.167)	(20,959.497)	(20,961.837)	(17,900.168)	(110,761.313)	(17,689.194)	(549,869.889)
House price	6,599.640***	6,579.997***	5,507.707***	5,687.441***	6,718.909***	16,879.82***	6,071.704***	28,942.322***
	(427.413)	(427.803)	(577.734)	(597.746)	(473.628)	(2,659.535)	(408.831)	(8,210.189)
Financial constraint	-38,287.998***	-38,197.518***	-55,085.318***	-55,387.955***	-38,068.362***	44,492.831	-41,914.941***	316,904.075
	(13,632.526)	(13,632.291)	(16,462.718)	(16,461.599)	(13,628.625)	(72,847.410)	(13,470.109)	(250,238.502)
Homeownership	207,332.080***	207,234.923***	192,879.134***	193,210.054***	207,438.773***	248,765.65**	211,548.264***	686,200.078*
	(19,964.967)	(19,964.909)	(24,228.307)	(24,225.519)	(19,966.055)	(117,897.819)	(19,724.719)	(405,165.440)
Observations	26,486	26,486	15,309	15,309	26,486	6,356	26,486	1,514
R-squared	0.158	0.158	0.178	0.178	0.159	0.304	0.175	0.312
Number of id	10,518	10,518	7,693	7,693	10,518	4,920	10,518	1,055
F-test	0.0648	0.0447	0.0812	0.789	2.597	1.731	314.3	1.235
Prob>F	0.799	0.833	0.776	0.374	0.107	0.188	0	0.267
HH FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All models include time fixed effects, state, industry and location dummies. But we do not report their coefficients for brevity. The F-test provides the test-statistics for the null hypothesis that the overall effect of the policy in the current and past three years on household wealth is zero. Prob>F shows the probability of accepting the null hypothesis. [a]RDD = Regression Discontinuity Design.

Table 9: Effect of tax policy on superannuation asset (FE estimate)

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD=1	(4) GCCOR if GCCOD=1	(5) CCC	(6) CCC (85th percentile	(7) D293	(8) D293 (RDD)
Policy	10,655.682**	7,791.617*	181.383***	9.719**	0.252	-0.130	95,335.256***	157,295.441*
	(4,928.590)	(4,026.706)	(67.087)	(4.729)	(0.196)	(1.381)	(22,455.694)	(91,341.939)
L.Policy	-1,319.123	106.031	15.836	1.287	-0.194	0.282	-37,465.309	-48,762.184
	(4,884.481)	(3,920.178)	(54.783)	(3.816)	(0.174)	(1.056)	(29,238.420)	(106,585.491)
L2.Policy	-6,710.109	-5,052.213	-55.686	-5.483	0.947***	-0.090	274,424.224**	95,731.352
	(5,309.650)	(4,199.450)	(59.684)	(4.268)	(0.208)	(1.596)	(32,888.301)	(139,048.560)
L3.Policy	-1,843.282	-1,929.709	18.150	-1.000	-0.173	0.142	167,227.396**	190,444.513
	(5,194.036)	(4,103.355)	(60.248)	(4.246)	(0.134)	(1.232)	(32,819.922)	(134,231.265)
House price	1,822.670***	1,818.416***	1,388.444***	1,324.941***	2,075.551***	7,463.818***	1,835.974***	4,420.064
	(159.149)	(159.289)	(253.043)	(244.602)	(176.283)	(903.478)	(177.045)	(2,960.217)
Income	0.338***	0.338***	0.293***	0.294***	0.333***	0.325***	0.101***	0.417***
	(0.018)	(0.018)	(0.027)	(0.027)	(0.018)	(0.063)	(0.032)	(0.156)
Income squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age of head	5,523.529***	5,570.412***	-89.298	1.152	3,573.935**	-	9,153.304***	-
	(1,223.620)	(1,227.437)	(1,813.754)	(1,819.859)	(1,397.275)	(11,008.415)	(2,399.666)	(29,576.892)
Age of head	-48.590***	-49.078***	16.617	15.585	-28.127**	402.738***	-81.707***	1,272.715***
	(12.027)	(12.059)	(18.754)	(18.805)	(13.890)	(110.474)	(23.838)	(286.281)
Head is male	13,564.322**	13,595.766**	11,494.324	11,715.079	13,624.304**	-13,994.017	9,841.223	-165,566.419
	(6,030.753)	(6,030.907)	(7,864.614)	(7,864.741)	(6,034.359)	(32,784.770)	(9,971.247)	(121,616.923)
Head is married	22,653.795**	22,726.788**	12,740.994	12,605.952	23,226.414**	-5,012.031	20,225.318	610,021.632**
	(8,583.534)	(8,587.461)	(11,478.508)	(11,491.108)	(8,599.565)	(51,893.222)	(14,973.286)	(260,820.235)
Head is working	-	-	-29,140.750*	-28,393.474*	-	176,722.659**	-7,449.401	69,906.258
	(11,514.389)	(11,511.516)	(14,969.395)	(14,970.285)	(11,504.874)	(62,308.264)	(17,865.329)	(162,350.955)
Education	-7,117.629	-6,954.498	-2,618.068	-2,351.652	-7,066.743	-37,242.975	-16,645.301	350,279.657
	(8,064.227)	(8,063.911)	(10,266.907)	(10,267.018)	(8,058.573)	(50,574.485)	(13,797.488)	(307,471.434)
HH size	24,472.975**	24,232.312**	16,394.031	15,787.480	24,709.402**	49,156.978	51,777.028***	136,946.833

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD=1	(4) GCCOR if GCCOD=1	(5) CCC	(6) CCC (85th percentile	(7) D293	(8) D293 (RDD)
	(8,647.429)	(8,652.055)	(10,854.326)	(10,868.953)	(8,659.343)	(47,408.379)	(16,073.636)	(171,770.984)
HH size squared	-2,565.928**	-2,589.358**	-2,207.777	-2,230.869	-2,554.152**	-6,303.786	-3,759.925*	-10,261.796
	(1,198.293)	(1,197.986)	(1,452.924)	(1,453.524)	(1,197.666)	(6,635.636)	(2,260.563)	(22,225.869)
No of children	-	-	-9,575.981*	-9,042.857	-	-31,456.870*	-	-45,925.341
	(4,430.776)	(4,440.969)	(5,719.934)	(5,743.174)	(4,447.887)	(18,598.652)	(8,428.993)	(55,420.911)
Indigenous	-16,857.700	-16,773.454	-3,837.480	-3,670.552	-16,735.926	222,429.311	4,779.693	1121503.533
	(29,029.428)	(29,028.632)	(36,265.138)	(36,263.108)	(29,003.183)	(294,246.912)	(51,995.868)	(922,884.826)
Financial	-	-	-18,079.434***	-17,984.576***	-	17,135.935	-15,515.932*	-
	(5,072.755)	(5,072.757)	(6,965.212)	(6,966.172)	(5,068.932)	(24,747.205)	(8,189.598)	(90,224.495)
Homeownership	-1,017.553	-1,052.874	6,904.773	6,899.836	-1,322.923	-40,707.378	850.280	-23,204.996
	(7,449.814)	(7,449.857)	(10,280.575)	(10,282.768)	(7,446.816)	(40,051.411)	(12,844.022)	(146,084.024)
Observations	17,213	17,213	15,309	15,309	17,213	6,356	15,359	1,514
R-squared	0.213	0.212	0.100	0.100	0.212	0.384	0.096	0.0143
Number of id	7,712	7,712	7,693	7,693	7,712	4,920	9,043	1,055
F-test	0.00991	0.0227	0.378	1.85	14.10	0.0215	322.3	6.055
Prob>F	0.921	0.880	0.538	0.174	0.0001	0.883	0.00	0.353
HH FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All models include time fixed effects, state, industry and location dummies. But we do not report their coefficients for brevity. The F-test provides the test-statistics for the null hypothesis that the overall effect of the policy in the current and past three years on super wealth is zero. Prob>F shows the probability of accepting the null hypothesis. RDD= Regression Discontinuity Design.

Table 10: Effect of tax policy on non-super wealth (FE estimate)

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD ==1	(4) GCCOR if GCCOD ==1	(5) CCC	(6) D293	(7) D293 (RDD)
Policy	7,004.838	8,022.637	12.734	164.276	-0.444	494,237.58***	28,738.467
	(11,751.978)	(9,601.368)	(9.825)	(139.384)	(0.467)	(42,327.185)	(218,037.944)
L1	-16,185.470	-12,412.418	-5.428	-70.727	0.301	65,287.883	306,832.511
	(11,646.802)	(9,347.360)	(7.928)	(113.820)	(0.414)	(53,355.642)	(254,425.093)
L2.	3,176.184	1,457.755	3.954	134.127	0.083	149,206.538**	-53,832.855
	(12,660.597)	(10,013.262)	(8.867)	(124.002)	(0.496)	(67,633.586)	(331,916.120)
L3.	461.966	-656.320	-10.455	-141.301	0.174	268,800.434***	-182,003.840
	(12,384.919)	(9,784.133)	(8.821)	(125.174)	(0.320)	(66,607.552)	(320,416.987)
House price	4,732.978***	4,718.439***	4,151.951***	4,271.354***	4,594.014***	4,384.286***	24,522.258***
	(379.483)	(379.813)	(508.167)	(525.733)	(420.617)	(364.959)	(7,066.190)
income	0.822***	0.823***	0.734***	0.731***	0.820***	0.598***	1.226***
	(0.043)	(0.043)	(0.056)	(0.055)	(0.043)	(0.045)	(0.372)
Income squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age of head	2,461.196	2,500.984	-8,316.635**	-8,415.674**	2,250.495	2,866.006	-50,144.644
	(2,917.661)	(2,926.729)	(3,780.805)	(3,768.330)	(3,333.940)	(2,882.130)	(70,601.574)
Age of head squared	1.919	1.438	120.639***	121.733***	4.653	-4.934	448.654
	(28.678)	(28.754)	(39.067)	(38.965)	(33.142)	(28.339)	(683.368)
Head is male	-2,824.381	-2,962.897	-18,318.662	-18,189.401	-2,436.573	-2,800.304	-167,271.202
	(14,380.031)	(14,380.229)	(16,339.203)	(16,339.843)	(14,398.162)	(14,280.568)	(290,305.901)
Head is married	8,750.290	9,023.405	349.976	303.285	8,195.034	16,406.478	1589450.27**
	(20,467.010)	(20,476.134)	(23,873.076)	(23,848.217)	(20,518.823)	(20,330.310)	(622,591.421)
Head is working	5,040.372	4,551.720	1,266.596	1,077.967	5,939.583	1,966.369	388,658.012
	(27,455.488)	(27,448.317)	(31,101.157)	(31,101.027)	(27,450.977)	(27,247.608)	(387,540.146)
Education	-53,144.470***	-53,016.867***	-66,534.922***	-66,399.686***	-52,691.713***	-49,652.454***	-816,116.407
	(19,228.747)	(19,227.769)	(21,329.996)	(21,330.946)	(19,227.999)	(19,099.581)	(733,950.253)
Household size	85,120.619***	84,261.796***	60,511.157***	61,790.920***	85,950.426***	94,012.685***	-231,971.969
	(20,619.364)	(20,630.155)	(22,580.533)	(22,551.391)	(20,661.453)	(20,456.687)	(410,026.244)

VARIABLES	(1) GCCOD	(2) GCCODH	(3) GCCOC if GCCOD ==1	(4) GCCOR if GCCOD ==1	(5) CCC	(6) D293	(7) D293 (RDD)
Household size squared	-8,667.375***	-8,591.047***	-5,022.516*	-5,062.330*	-8,717.352***	-9,464.057***	18,305.181
	(2,857.271)	(2,856.504)	(3,019.735)	(3,018.655)	(2,857.668)	(2,836.791)	(53,054.301)
No. of children	-7,705.292	-7,520.251	-12,726.237	-13,432.392	-7,343.379	-10,219.324	240,815.457*
	(10,564.965)	(10,589.147)	(11,931.594)	(11,883.969)	(10,612.792)	(10,486.722)	(132,292.587)
Indigenous	-56,698.421	-56,346.814	-30,391.429	-30,853.652	-55,612.123	-46,385.330	2948807.860
	(69,219.225)	(69,216.522)	(75,337.550)	(75,345.933)	(69,202.469)	(68,732.830)	(2202973.920)
Financial constraint	-26,051.933**	-25,990.573**	-37,361.766***	-37,579.280***	-26,105.135**	-28,774.328**	499,116.695**
	(12,095.731)	(12,095.595)	(14,472.404)	(14,471.210)	(12,094.624)	(12,013.798)	(215,370.547)
Homeownership	206,914.896***	206,872.28***	185,383.278***	185,622.293***	207,391.201***	209,889.865***	709,405.074**
	(17,763.711)	(17,763.606)	(21,362.718)	(21,359.343)	(17,768.328)	(17,641.257)	(348,710.138)
Observations	26,486	26,486	15,309	15,309	26,486	26,486	1,514
R-squared	0.108	0.108	0.129	0.129	0.108	0.120	0.231
F-test	0.0873	0.0613	0.00277	0.125	0.0461	140.9	0.0678
Prob>F	0.768	0.805	0.958	0.723	0.830	0	0.795
Number of id	10,518	10,518	7,693	7,693	10,518	10,518	1,055
HH FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All models include time fixed effects, state, industry and location dummies. But we do not report their coefficients for brevity. The F-test provides the test-statistics for the null hypothesis that the overall effect of the policy in the current and past three years on super wealth is zero. Prob>F shows the probability of accepting the null hypothesis. RDD= Regression Discontinuity Design.

Table 11: Heckman estimates (effects on households' saving)

VARIABLES	(1) SAVINGD	(2) GCCOD	(3) GCCODH	(4) GCCOC if GCCOD=1	(5) GCCOR if GCCOD=1	(6) CCC	(7) D293
Policy		0.012**	0.017***	0.000	0.001***	0.000***	-0.084***
		(0.005)	(0.004)	(0.000)	(0.000)	(0.000)	(0.026)
Income	5.935***	2.962***	2.933***	3.907***	3.960***	2.891***	3.922***
	(0.214)	(0.141)	(0.141)	(0.388)	(0.386)	(0.141)	(0.217)
Income squared	-0.204***	-0.062***	-0.061***	-0.104***	-0.107***	-0.059***	-0.102***
	(0.010)	(0.006)	(0.006)	(0.016)	(0.016)	(0.006)	(0.009)
Age of head	-0.020***	-0.015***	-0.015***	-0.012***	-0.013***	-0.019***	-0.017***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Age of head squared	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Head is male	0.048***	0.005	0.006	0.003	0.002	0.004	-0.004
	(0.012)	(0.005)	(0.005)	(0.008)	(0.008)	(0.005)	(0.006)
Head is married	-0.161***	-0.095***	-0.095***	-0.145***	-0.145***	-0.093***	-0.056***
	(0.015)	(0.006)	(0.006)	(0.011)	(0.011)	(0.006)	(0.009)
Head is working	-0.083**	-0.057***	-0.057***	-0.017	-0.017	-0.053***	-0.081***
	(0.035)	(0.013)	(0.013)	(0.021)	(0.021)	(0.013)	(0.017)
Education	-0.164***	-0.050***	-0.050***	-0.040***	-0.040***	-0.048***	-0.057***
	(0.012)	(0.005)	(0.005)	(0.008)	(0.008)	(0.005)	(0.007)
HH size	-0.178***	-0.020***	-0.021***	-0.020*	-0.020	-0.022***	-0.062***
	(0.019)	(0.007)	(0.007)	(0.012)	(0.012)	(0.007)	(0.011)
HH size squared	0.009***	0.005***	0.004***	0.004***	0.004***	0.005***	0.009***
	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
No of children	-0.024**	-0.094***	-0.093***	-0.090***	-0.091***	-0.088***	-0.091***
	(0.012)	(0.004)	(0.004)	(0.007)	(0.007)	(0.004)	(0.006)
Indigenous	0.159***	0.075***	0.075***	0.046**	0.046**	0.073***	0.085***
	(0.030)	(0.012)	(0.012)	(0.020)	(0.020)	(0.012)	(0.016)
Homeownership	-0.102***	-0.017***	-0.017***	-0.043***	-0.043***	-0.018***	-0.004
	(0.013)	(0.005)	(0.005)	(0.011)	(0.011)	(0.005)	(0.007)
Financial constraint	0.070***	-0.044***	-0.045***	-0.045***	-0.045***	-0.044***	-0.036***

VARIABLES	(1) SAVINGD	(2) GCCOD	(3) GCCODH	(4) GCCOC if GCCOD=1	(5) GCCOR if GCCOD=1	(6) CCC	(7) D293
	(0.012)	(0.005)	(0.005)	(0.008)	(0.008)	(0.005)	(0.007)
lambda		-0.107***	-0.108***	-0.524***	-0.525***	-0.135***	-0.001
		(0.033)	(0.033)	(0.075)	(0.075)	(0.033)	(0.042)
Observations	111,427	111,427	111,427	37,006	37,006	111,427	53,897
HH FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All models include time fixed effects, state, industry and location dummies. But we do not report their coefficients for brevity.

Table 12: Summary of all key findings

Eq.	Table	Independent variable	Dependent variable	Estimated coefficients	Interpretation
Eq.1	Table 6	GCCOD	ln(saving)	0.005	No significant impact of having a member eligible for G co-contribution on household saving.
Eq.1	Table 6	GCCODH	ln(saving)	0.007*	Having one more member eligible for G co-contribution increases household saving by 0.7%
Eq.1	Table 6	GCCOC	ln(saving)	0.000	No significant impact of an increase in the G co-contribution cap (GCCOC)
Eq.1	Table 6	GCCOR	ln(saving)	0.001	No significant impact of an increase in the G co-contribution rate (GCCOR)
Eq.1	Table 6	CCC	ln(saving)	-0.0000005***	Increasing the concessional contribution cap by a dollar reduces private saving by 0.00005%
Eq.1	Table 6	Ln(CCC)	ln(saving)	-0.034***	Increasing the concessional contribution cap by 1% (Ln(CCC)) reduces saving by 0.034%
Eq.1	Table 6	D293	ln(saving)	-0.120***	Households subject to D293 tax reduce their private savings by 12.7% (=100X(e0.12 – 1)%)
Eq.2	Table 8	GCCOD (and L1/L2/L3)	wealth	17,350.12/-17,372.17/-3,286.46/-2,074.44	No significant effect of eligibility for government co-contribution on household wealth
Eq.2	Table 8	GCCODH (and L1/L2/L3)	wealth	15428.11/-12,316.37/-3,471.11/-3,096.12	Having one more member eligible for G co-contribution does not increases household wealth
Eq.2	Table 8	GCCOC (& L1/L2/L3)	wealth	22.176**/-4.23/-1.65/-11.35	An increase in the G co-contribution cap increases household wealth
Eq.2	Table 8	GCCOR (and L1/L2/L3)	wealth	345.156**/-51.42/77.22/-123.48	An increase in the G co-contribution rate increases household wealth
Eq.2	Table 8	CCC (and L1/L2/L3)	wealth	-0.185/0.107/1.039*/-0.002	Lagged positive effect of changes in concessional contributions cap on household wealth
Eq.2	Table 8	CCC (and L1/L2/L3)(85p)	wealth	-2.757/-0.446/-3.846/1.646	No significant impact of changes in CCC on wealth, for top contributors.
Eq.2	Table 8	D293 (and L1/L2/L3)	wealth	652,146.13***/143,226.48**/ 383,460.38***/416,741.33***	D293 households have significantly more wealth than non-D293 households.
Eq.2	Table 8	D293 (and L1/L2/L3()RDD)	wealth	186,033.9/258,070.33/ 41,898.5/8,440.67	No significant impact of D293 tax on household wealth.
Eq.2	Table 9	GCCOD (and L1/L2/L3)	Super balance	10,656**/-1,319/-6,710/-1,843	Being eligible for G co-contribution increases a household's super balance
Eq.2	Table 9	GCCODH (and L1/L2/L3)	Super balance	7,792*/106/-5,052/-1,929.7	Having more members eligible for G co-contribution increases a household's super balance.
Eq.2	Table 9	GCCOC (and L1/L2/L3)	Super balance	181.38***/15.84/-55.67/18.15	An increase in the G co-contribution cap increases household super balance
Eq.2	Table 9	GCCOR (and L1/L2/L3)	Super balance	9.72**/1.29/-5.48/-1.00	An increase in the G co-contribution rate increases household super balance
Eq.2	Table 9	CCC (and L1/L2/L3)	Super balance	0.252/-0.194/0.947***/-0.173	An increase in the concessional contribution cap increases household super balance
Eq.2	Table 9	CCC (and L1/L2/L3)(85p)	Super balance	-0.130/0.282/-0.090/0.142	No significant impact of changes in CCC on super balance, for top contributors.
Eq.2	Table 9	D293 (and L1/L2/L3)	Super balance	95,335***/37,465/ 274,424***/167,227***	D293 households have higher super balance than non-D293 households.
Eq.2	Table 9	D293 (and L1/L2/L3)(RDD)	Super balance	157,295.44*/-48,762.18/ 95,731.35/190,444.51	No significant impact of D293 tax on household super balance.
Eq.2	Table 10	GCCOD (and L1/L2/L3)	non-super wealth	7,004.84/-16,185.47/3,176.18/461.97	No significant impact of eligibility for G co-contribution on household non-super wealth
Eq.2	Table 10	GCCODH (and L1/L2/L3)	non-super wealth	8,022.64/-12,412.42/1,457.76/-656.32	Having one more member eligible for G co-contribution does not increases non-super wealth
Eq.2	Table 10	GCCOC (and L1/L2/L3)	non-super wealth	12.73/-5.43/3.95/-10.46	No significant impact of G co-contribution cap on household non-super wealth
Eq.2	Table 10	GCCOR (and L1/L2/L3)	non-super wealth	164.28/-70.73/134.13/-141.3	No significant impact of G co-contribution rate on household non-super wealth
Eq.2	Table 10	CCC (and L1/L2/L3)	non-super wealth	-0.444/0.301/0.083/0.174	No significant impact of concessional contributions cap on household non-super wealth
Eq.2	Table 10	D293 (and L1/L2/L3)	non-super wealth	494,237.58***/65,287.89/ 149,206.54**/268,800.43***	D293 households have significantly higher non-super wealth than non-D293 households.
Eq.2	Table 10	D293 (and L1/L2/L3)(RDD)	non-super wealth	28,738.47/306,832.51/ -53,832.86/-182,003.84	No significant impact of D293 tax on household non-super wealth.
Eq. 3-6	Table 11	***Heckman sample selection model***			
		GCCOD	ln(saving)	0.012**	Households who are eligible for G co-contribution save 1.2% more than those who are not.
		GCCODH	ln(saving)	0.017***	Having one more member eligible for G co-contribution increases household saving by 1.7%.
		GCCOC	ln(saving)	0.000	No significant impact of an increase in the G co-contribution cap on household saving.
		GCCOR	ln(saving)	0.001***	An increase in the G co-contribution rate positively affects household saving.
		CCC	ln(saving)	0.000***	An increase in the concessional contribution cap positively affects household saving.
		D293	ln(saving)	-0.084***	Households subject to D293 tax reduce their private savings by 8.4%.

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