



Tax Policy Center

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**FINAL REPORT
TO INLAND REVENUE
“KiwiSaver Evaluation Literature Review”
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Independent, timely, and accessible analyses of current and emerging tax
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Content

EXECUTIVE SUMMARY	I
I. INTRODUCTION	1
II. RETIREMENT SAVINGS IN NEW ZEALAND	2
II.A. SOURCES OF RETIREMENT SAVING OF NEW ZEALAND RESIDENTS	2
II.B. DO NEW ZEALANDERS SAVE ENOUGH?	4
II.C. THE TAX TREATMENT OF PRIVATE SAVING IN NEW ZEALAND	5
II.D. KIWISAVER AS AN ALTERNATIVE RETIREMENT SAVINGS VEHICLE.....	6
III. STUDIES RELEVANT TO ENROLMENT, CONTRIBUTION LEVELS, AND ASSET ALLOCATION IN KIWISAVER	9
III.A. INTRODUCTION.....	9
III.B. TYPES OF STUDIES	9
III.C. PRINCIPAL FINDINGS	11
III.D. IMPLICATIONS FOR KIWISAVER AND HOW TO EVALUATE IT	13
IV. STUDIES THAT ESTIMATE ATTITUDES AND BEHAVIORAL RESPONSES	17
IV.A. INTRODUCTION.....	17
IV.B. METHODOLOGICAL ISSUES	17
IV.C. RESEARCH APPROACHES.....	18
IV.D. SUMMARY OF FINDINGS ON EFFECTS OF SAVING PROGRAMS ON NET HOUSEHOLD SAVING.....	21
IV.E. EFFECT OF SAVING PROGRAMS ON ATTITUDES	22
IV.F. IMPLICATIONS OF LITERATURE FOR KIWISAVER	22
V. STUDIES ON IMPACTS OF SAVING INCENTIVE PROGRAMS ON NATIONAL SAVING 26	
V.A. INTRODUCTION	26
V.B. INDIRECT EFFECTS ON NATIONAL SAVING	27
V.C. CHANGES IN EFFECT ON NATIONAL SAVING OVER TIME.....	28
V.D. THE IMPORTANCE OF HOW GOVERNMENT FINANCES SUBSIDIES TO RETIREMENT SAVING	30
V.E. SOME IMPLICATIONS FOR EVALUATING THE EFFECTS OF KIWISAVER	31
VI. SUGGESTIONS FOR EVALUATING KIWISAVER.....	35
VI.A. VARIABLES OF INTEREST: WEALTH AND SAVING	35
VI.B. RELEVANCE OF WEALTH AND SAVING VARIABLES	36
VI.C. MEASURING WEALTH AND SAVING.....	36
VI.D. ESTIMATING HOW KIWISAVER AFFECTS WEALTH AND SAVING	38
VI.E. SUCCESS AND HOW TO IMPROVE KIWISAVER	40
VI.6. CONCLUDING REMARKS	41

FINAL REPORT

Inland Revenue

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Executive Summary

New Zealand is introducing a new saving incentive scheme called KiwiSaver on 1 July 2007. The goals of KiwiSaver are to improve the financial position of New Zealanders in retirement, increase aggregate private saving in New Zealand, and reduce New Zealand's reliance on external debt.

The main innovation in KiwiSaver is a provision for automatic enrolment of all new employees, with 4 percent of earnings withheld and contributed to employee investment accounts and an allocation of the savings among assets selected automatically if an employee fails to make a choice. Employees have up to 8 weeks from the start of a new job to opt out from the scheme, but may also increase their contribution to 8 percent. KiwiSaver provides financial inducements for participation, including a \$1,000 initial subsidy, a subsidy for the purchase of a first home of up to \$5,000 (subject to income and house price limits), and exemption from tax of up to 4 percent of employer contributions into the accounts. But the financial incentives are smaller than the incentive provided by exemption of all income accrued within qualified retirement plans, which is a feature of incentive plans in the United States, the United Kingdom, Canada, Australia, and other countries.

KiwiSaver will supplement New Zealand Superannuation (NZS), which provides flat benefit amounts for singles and couples when they reach the Superannuation age (currently 65). While NZS provides a basic level of income for all retirees, middle-income New Zealanders are at risk of seeing a substantial drop in their living standards at retirement unless they can supplement NZS with income from employment-based superannuation plans or their own saving. But superannuation plans provided by private employers cover only a small share of workers and many New Zealanders do not save much on their own. KiwiSaver intends to fill in the gap in the retirement security system by creating a new employment based saving plan in which most employees will participate.

Recent research shows that both financial incentives and default rules have a powerful effect on decisions on whether to participate in and how much to contribute to retirement saving plans. The evidence on default rules is particularly striking, with automatic enrolment substantially increasing participation in the same tax-favored saving plans, compared with a default rule that requires employees to make an active decision to participate. Studies also show that individuals maintain the default contribution amount and choose the default asset portfolio option, in the absence of extensive advertising of alternative choices. The studies suggest that the automatic enrolment provision in KiwiSaver will induce a high level of participation.

The effect of saving incentive plans on net private saving is less clear. Individuals can finance their contributions to subsidized saving plans by saving more (reducing consumption), by reducing saving outside the plan, or by borrowing. Many studies have examined the effect of saving incentive plans on net saving by comparing overall wealth accumulation of those who are eligible for or participate in a tax-favored plan with the wealth accumulations of non-participants, but these studies suffer from an inability to compare similar groups with identical tastes for saving. Researchers have used a variety of methods to identify similar individuals with different exposures to saving programs, but have not reached a consensus on whether the saving programs they examined increased net saving. Some found substantial increases in net saving, others found virtually no effect, and still others identified positive effects, but only for selected groups, such as individuals with lower earnings or wealth or individuals who do not own homes. No studies have specifically examined whether the large increase in participation induced by an automatic enrolment rule is associated with an increase in net saving or a transfer of wealth from other accounts. Overall, therefore, while the literature on saving incentives provides strong reasons to expect a high level of participation in KiwiSaver, it provides limited insight on how much that participation will boost net personal saving.

Broader issues must be considered in assessing the effects of an incentive program on national saving. There can be indirect on effects on saving, investment, and risk-taking if people allocate assets within an employer-sponsored plan differently than they do for assets outside one. There is some evidence, for example, that the expansion of tax-favored plans in the United States has promoted the growth of more conservative investment portfolios with higher shares of bonds and large-company stocks. These portfolio shifts and associated changes in asset prices and relative yields could affect saving outside of incentive plans and government revenues. Positive effects on national saving from an incentive plan will grow over time, as people reduce their stock of other assets over time and need to finance additional contributions from new saving and as any increases in total assets in the economy boost government revenues. Studies have produced mixed results, however, on both the extent of any increase in national saving and the length of time before an increase materializes. Finally, the net effect of an incentive program on national saving depends on whether its fiscal costs are paid for by government borrowing or higher taxes and the form of any additional taxes. Because KiwiSaver relies relatively less on costly financial incentives as a tool to induce people to save more, it might increase net national saving more, for any increase in net private saving, than programs that rely more heavily on larger and more costly tax subsidies that increase government deficits.

KiwiSaver is a unique program that is applying the results of new and exciting empirical research that shows how automatic enrolment can increase participation in saving programs. KiwiSaver will be the first large-scale attempt to test whether a saving program that relies more on a change in the default rule than on financial incentives can be more effective in increasing retirement saving. A careful evaluation of its effects should generate widespread interest, as countries around the world look towards developing more effective ways to ensure financial security for aging populations.

I. Introduction

New Zealand is introducing the KiwiSaver program on 1 July 2007. KiwiSaver is a new saving incentive scheme designed to improve the financial position of New Zealanders in retirement, increase aggregate private saving in New Zealand, and reduce New Zealand's reliance on external debt.

This report reviews the international literature on saving incentives that is relevant for gauging the probable outcomes of KiwiSaver and designing ways to measure its outcomes. We review studies that (1) assess the effects of the design of saving incentive plans on participation in and contributions to the plans, (2) evaluate the extent to which the plans increase net private saving, and (3) explore broader issues of how saving incentive plans affect national saving and wealth accumulation. We provide tabular summaries of the principal studies on each of these three issues. For each group of studies, we discuss the extent to which the findings are relevant for understanding the probable effects of KiwiSaver and assessing its impact after the fact. The paper concludes with some broad suggestions on how to design a research program to evaluate the effects of KiwiSaver on plan participation, income distribution, net private saving, and national saving and wealth accumulation.

Section II of the report reviews the literature on saving and wealth accumulation in New Zealand and on whether New Zealanders in different income groups are preparing adequately for retirement. It also reviews the tax treatment of private saving and superannuation plans in New Zealand and summarizes the main features of the new KiwiSaver scheme. Section III reviews the literature that is relevant to understanding the determinants of the level of enrolment in KiwiSaver, the annual contribution rate as a percentage of earnings, and the allocation of savings in KiwiSaver among alternative asset choices. Section IV reviews the literature on the effects of saving incentive plans on net saving of participants. Section V reviews papers that address broader issues of how saving incentive plans affect saving and wealth accumulation in the long-run and national saving, taking consideration of second-order effects from changes in private saving rates and portfolio allocation and assessing the effects of alternative ways of financing the initial government revenue loss. A final section provides some overall comments on issues in developing a strategy to evaluate the effects of KiwiSaver.

II. Retirement Savings in New Zealand

This section provides background on retirement saving in New Zealand. We discuss sources of retirement saving, current tax provisions affecting saving, and how incentives are altered by the proposed KiwiSaver program.

II.A. Sources of Retirement Saving of New Zealand Residents

As with many other advanced economies, New Zealand residents have three main sources of retirement saving—(1) a mandatory government superannuation program (New Zealand Superannuation, or NZS), (2) employer-provided superannuation plans, and (3) private saving outside of superannuation plans. The first provides a basic floor of income in retirement to all New Zealand residents, while the others help New Zealanders achieve a higher living standard in retirement. Concerns about the current adequacy of employer-provided plans and other saving for maintaining living standards after retirement for middle-income New Zealanders is one factor that motivated development of the KiwiSaver program.

II.A.1. New Zealand Superannuation (NZS)

NZS provides a basic flat retirement benefit for all individuals and couples when they reach the Superannuation age (currently at age 65). NZS benefits are taxable as income under the New Zealand Income Tax law, making net-of-tax benefits somewhat lower for high-income individuals, but the pre-tax benefits are not reduced as other income rises. The benefits are guaranteed to be between 65 and 72.5 percent of net (i.e., after-tax) average earnings for married couples. Singles living alone receive 65 percent of the married couple benefit (between 42.3 and 47.1 percent of net average earnings) and other singles receive 60 percent of the married-couple benefit (between 39.0 and 43.5 percent of net average earnings).¹

Scobie, Gibson, and Le (2004, 27–28) report that NZS benefits account for a significant share of retirement wealth of New Zealanders. On average, NZS accounts for 46.4 percent of total wealth—defined as the sum of housing, financial, pension and NZS wealth—for “married” households and 58.4 percent for “single” households.² NZS is a larger share of total wealth for married households with low income than for average households. Scobie et al. (2004) report that

¹ See New Zealand Superannuation Act 2001 (pages 10 to 11 http://www.executive.govt.nz/minister/cullen/superannuation/super_act_2001.pdf). Net average earnings are Average Ordinary Time Weekly Earnings less deduction of tax, where Average Ordinary Time Weekly Earnings are the average before-tax weekly earnings of adult employees. For more information about Average Ordinary Time Weekly Earnings, see <http://www.treasury.act.gov.au/snapshot/AWOTE.pdf>.

² Married households are defined as households with couples, while single households are defined as households with un-partnered individuals. Scobie et al. (2004) develop their estimates from data in the 2001 Household Saving Survey and the 2001 Household Economic Survey. The 2001 Household Saving Survey interviewed New Zealand resident households at least 18 years of age. The survey represents approximately 98 percent of New Zealand resident households. See <http://www.stats.govt.nz/products-and-services/Articles/hhold-savings-Apr03.htm>. The 2001 Household Economic Survey interviewed a sample of “New Zealand-resident, private households living in permanent private dwellings” about their incomes and expenditures. Visit <http://www.stats.govt.nz/products-and-services/info-releases/hes-info-releases.htm> for more information on this survey.

NZS wealth accounts for 76.2 percent of median wealth for married households in the bottom quintile of the income distribution, compared with 38.4 percent of median wealth for married households in the top quintile.³

Both Scobie et al. (2004, 20) and St. John (2005b, 5) argue that NZS benefits help prevent poverty among the aged in New Zealand. Scobie et al. (2004, 18) note that "... NZS provides a floor under retirement income, so while there [is] a significant share of the population falling below the poverty line [defined as 60 percent of the median income of the population], the actual gap in dollar terms is quite small." St. John (2005b) based her view on the effectiveness of NZS on the fact that Superannuation benefits for married couples are between 65.0 and 72.5 percent of the net Average Ordinary Time Weekly Earnings and between 39.0 and 47.1 percent of the net earnings for singles, while the Ministry of Social Development defines low income households as households whose income is no more than 60 percent of the median "equivalent net-of-housing-cost family incomes."⁴ The conclusion that NZS benefits prevent poverty among the aged follows directly from the observation that NZS benefits replace a very high share of earnings for individuals who earned much less than the Average Ordinary Time Weekly Earnings. For example, for couples that earned 60 percent of median income before retirement, NZS replaces over 100 percent of pre-retirement earnings.⁵

II.A.2. Employer Provided Superannuation.

Employer-provided superannuation plans appear to play a limited role in New Zealand. Scobie et al. (2004, 27–28) document that, on average, employer-provided plans account for only 4.5 percent of total wealth for married households and 3.7 percent for single households. This may reflect the fact that retirement saving in New Zealand receives very little tax preference (St. John 2001, 271) and that employers have moved toward relying on employees to choose savings instruments and the amount saved (St. John 2001, 275).⁶ There was a notable decline in employer-provided superannuation plans between 1993 and 2003. During this period, the number of employees covered in a superannuation plan provided by a private employer as a percentage of the employed labor force decreased from 18.5 to 11.4 percent (St. John 2005b, 5).⁷ As in other developed countries, and for possibly the same reasons (increased labor force mobility, changes in the composition of employment), coverage in defined benefit plans has declined in the last decade but, unlike in the United States and elsewhere, coverage in defined contribution schemes has not increased to take up the slack.

³ The median values of NZS wealth and total wealth of married households in the lowest fifth of the income distribution are \$287,507 and \$377,317 and are \$269,442 and \$701,689 for married households in the highest fifth of the income distribution. Scobie et al. do not report median wealth values for single households.

⁴ See page 66 of <http://www.socialreport.msd.govt.nz/2004/documents/social-report-2004.pdf> for more detail on the definition of low-income households.

⁵ It should be noted that New Zealand does not have any official poverty line and measures of low-income are defined relative to average incomes instead of as an absolute standard. The 60 percent threshold employed by the Ministry of Social Development and Scobie et al. (2004) is arbitrary. For more discussion of measures of low-income status used in New Zealand, see <http://www.stats.govt.nz/products-and-services/Articles/income-distrib-May99.htm>.

⁶ We discuss the tax treatment of superannuation plans in New Zealand in Section II.C below.

⁷ The changes in the tax system during this period, notably the elimination of tax benefits for superannuation plans between 1988 and 1990, contributed to this phenomenon (St. John 2001, 275). See Section II.C and St. John (2005a).

II.A.3 Private Savings

In terms of private savings outside of superannuation plans, Scobie et al. (2004, 27-28) report that, on average, financial and housing wealth together account for 49.0 percent of the total wealth for married households and 37.9 percent for the single households. However, the distributions of financial and housing wealth are concentrated among high-wealth households. As evidence of this concentration, the means of financial and housing wealth for married households are \$205,187 and \$85,502, while the corresponding median values of wealth are \$51,350 and \$36,000, respectively. In contrast, NZS wealth is evenly distributed; the mean and median of NZS wealth are \$275,075 and \$270,414, respectively. An implication of these data is that a majority of New Zealand married households have limited retirement resources apart from the their NZS benefits.⁸

II.B. Do New Zealanders Save Enough?

Whether households in New Zealand accumulate sufficient wealth for a comfortable retirement is a subject of debate. Kerr (2002) argues that the evidence does not support a conclusion that New Zealand households are not saving enough for retirement.⁹ Examining households' saving rates and wealth holdings, Scobie et al. (2004) conclude that, on average, households seem to prepare well for retirement by saving enough to maintain their living standards in retirement, although they do not rule out the possibility that some households may not save adequately.¹⁰ Their conclusion is based critically on the assumption that NZS benefits will be kept at the current level. Given that NZS benefits are practically constant across individuals and only a small number of individuals have employer-provided pensions, St. John (2005b, 5) suggests that individuals with moderate earnings are the most vulnerable to deteriorated living standards in retirement. This is because these individuals require more than NZS benefits to afford retirement

⁸ Scobie et al. (2004) do not report similar information for single households.

⁹ Kerr (2002) examines the existing literature to determine whether the level of private and national saving in New Zealand warrants the concern it has raised over the past decades. He cites several studies that agree there are problems with the measurement of saving. If saving rates were measured accurately, these studies suggest that saving behavior in New Zealand would be similar to that in other comparable countries. Kerr does not find any convincing evidence to support the assumption that New Zealand has a particularly poor saving record.

¹⁰ Scobie et al. (2004) assess the adequacy of retirement savings under a consumption-smoothing criterion. Using data on income and wealth from the 2001 Household Saving Survey, they calculate for each household the share of income it must save to maintain the same level of consumption after retirement as before retirement under a life-cycle framework. They then compare the median value of this optimal saving rate with the median saving rate derived from the 2001 Household Economic Survey. The comparison is only done for married households due to data limitations. They find that the median saving rate is higher than the optimum rate in general, which suggests that median households were saving enough to maintain consumption in retirement. However, because they use different data sets for income and wealth and for the median saving rate, they cannot estimate the percentage of households who are not saving enough to maintain consumption in retirement.

The findings in Scobie et al. are controversial. The authors estimate saving adequacy by assuming individuals prefer a smooth consumption pattern over time whose optimal values can be derived from a life-cycle model with a particular specification. It is not clear how the findings might change if other criteria are used or other assumptions, such as the well-known decrease in consumption levels at the time of retirement, are incorporated in the analysis. In addition, the authors' findings of adequate saving for median households would not hold if they treated spending on durable goods as current consumption, instead of saving. See Bollard et al. (2006) for more discussion on issues about measuring saving.

consumption at a level comparable to their consumption level before retirement, but often accumulate little in other sources of retirement wealth.¹¹

In addition to concerns about the adequacy of retirement income, there is also concern about how the relatively low level of private saving increases New Zealand's reliance on external sources of funds to finance the domestic investment needed for a growing economy. National saving has been declining over the past few decades. Claus and Scobie (2002) report that national saving as a percentage of GDP declined from 6 percent in 1972 to 2 percent in 2001. Bollard et al. (2006) report that household saving plummeted between 2000 and 2005.

II.C. The Tax Treatment of Private Saving in New Zealand

Under the normal rules of an income tax, all earnings and income from investments are subject to tax, but withdrawals of funds accrued from previously taxed income are not subject to tax. Under these rules, deposits to savings accounts or investment funds come from after-tax dollars, income from assets in the accounts is taxed annually as accrued in the form of interest, dividends, and capital gains, and withdrawals from the accounts are tax-free. This treatment of ordinary savings assets is often referred to as TTE (*tax* deposits, *tax* earnings, and *exempt* withdrawals).

Few countries tax income from investments comprehensively. For example, many provide some exemptions or preferential tax rates for income in the form of capital gains and all allow the returns from capital gains to accrue tax-free until the gains on assets are realized through sale or exchange. Thus, the middle “T” in the TTE formula is usually less than a full T, at least for some assets that savers or their investment funds hold.

In many OECD countries, there are special preferences for tax-qualified retirement savings accounts. Often, these accounts are subject to EET treatment; deposits are from pre-tax dollars (either by exempting employer contributions from taxable earnings or allowing a deduction for employee contributions), earnings accrued within qualified funds are tax-exempt, and withdrawals of both principal and earnings are taxable.¹² If individuals are in the same marginal income tax bracket when contributing funds during working years and withdrawing funds in retirement, then EET is economically equivalent to TEE—a regime in which all earnings are taxable, deposits come from after-tax dollars, but investment income and withdrawals are tax-free.¹³

Between 1988 and 1990, New Zealand eliminated tax preferences for employer-provided superannuation plans as part of a broader set of reforms that lowered and flattened income tax rates and broadened the tax base (St. John, 2001). After this change, superannuation plans were

¹¹ Similarly, Scobie et al. (2004, 16) suggest that individuals with low income or high wealth already have enough retirement resources to guarantee retirement consumption at a level comparable to the level of consumption before retirement. Low-income individuals who find NZS benefits to be sufficient to finance retirement do not need to save more and high wealth individuals may find their private wealth sufficient to finance their retirement.

¹² Examples of EET systems are the traditional Individual Retirement Account (IRA) and the 401(k) program in the United States and the Registered Retirement Savings Plan program in Canada.

¹³ An example of a TEE system is the Roth Individual Retirement Account (Roth IRA) in the United States. Individuals who qualify for a Roth IRA deposit after-tax dollars in the account, but then pay no tax on subsequent investment earnings or withdrawals.

subject to a TTE regime, with both employer contributions to and earnings on these plans taxable at the then top individual and corporate rate of 33 percent. Taxation of plan income and contributions at a single rate allowed the tax to be collected from employers instead of individual employees. Taxing individual employees would be much more complicated because it would require employees to report both their employers' contributions and also income accrued based on those contributions. But the actual value of accrued benefits to any employee is uncertain in the case of defined benefit plans because it depends on the employee's future earnings and tenure with her current employer.

Subsequent to the introduction of the TTE regime for superannuation plans, New Zealand introduced a more graduated income tax rate schedule, with many workers facing a 21 percent rate and a new top bracket for high-income individuals of 39 percent (St. John, 2001). The result is that the TTE regime for superannuation plans imposed punitive rates on low-bracket taxpayers (compared with what they would have paid on income from accounts outside a plan) and a favorable rate for the highest-income individuals. A subsequent change has been made to eliminate the incidental penalty on low-bracket taxpayers on contributions, but income accrued within plans is still taxed at a flat rate.¹⁴ New Zealand also provides preferential treatment for some assets, most notably by exempting from tax capital gains on assets held for investment instead of trading. The capital gains preference, however, applies to assets both within and outside of superannuation plans.

Thus, relative to other OECD countries, the most notable feature of the New Zealand tax treatment of retirement is the absence of any special preference for income accrued within superannuation plans or other employer-sponsored savings vehicles. No one gets to accrue income tax-free within the plans, except to the extent that income is earned in a form (e.g. capital gains on investment assets) that is tax-free both within and outside of the accounts.

II.D. KiwiSaver as an Alternative Retirement Savings Vehicle

The goals of the KiwiSaver program are to improve the financial position of New Zealanders in retirement, increase aggregate private saving in New Zealand, and reduce New Zealand's reliance on external debt (Inland Revenue Department, 2006). The program was designed by adapting successful features of retirement programs in various countries (Savings Product Working Group, 2004). In particular, three features of the program stand out as important departures from traditional saving plans in New Zealand—(1) automatic enrolment and contributions, (2) incentives and subsidies, and (3) constraints and penalties.

II.D.1. Automatic Enrolment and Contributions

Unlike in existing employer saving plans in New Zealand, the default of the KiwiSaver program is that new employees will be automatically enrolled in the program. If they take no action to opt out from the program, four percent of their earnings will be withheld and contributed to the program. Further, if they do not indicate any preference, their contribution will be deposited in a

¹⁴ Employers withhold tax on the contributions based on the marginal tax rate applicable to an employee's prior year earnings. See <http://www.taxpolicy.ird.govt.nz/publications/files/sscwtpaper.doc> for more detail.

pre-specified investment choice. Individuals have eight weeks since the start of their new jobs to opt out from the program, but are relatively free to change their level of contribution and investment choices once they join the program.

II.D.2. Incentives and Subsidies

The KiwiSaver program provides four primary incentives or subsidies. Individuals who participate in the KiwiSaver program qualify for (1) an initial \$1,000 subsidy, (2) a subsequent \$5,000 maximum housing subsidy, and (3) lower investment fees than other investment accounts. In addition, (4) employers' contributions of up to 4 percent of employees' earnings into employees' accounts are free of Specified Superannuation Contributions Withholding taxes.¹⁵

Because the \$1,000 subsidy applies only to the initial contribution, it does not raise the marginal benefit from continuing to contribute to the accounts, so that the tax treatment of additional contributions after initial enrolment is still TTE. The subsidy does raise wealth at the time of retirement by $\$1,000 \times (1 + r)^t$, where r is the rate of return on assets and t is the number of years between enrolment and retirement. In contrast, the low investment fees effectively raise the rate of return on KiwiSaver accounts relative to the return on other investment accounts, which in turn makes participation in KiwiSaver more attractive than other saving.

The exemption of up to 4 percent of the employer contribution is initially smaller than the start-up subsidy. For a worker with the average weekly income from wages and salaries in 2005, the exemption of tax on the employer's 4-percent contribution is worth \$259 per year in 2005.¹⁶ But over time, the 4 percent exemption is a more significant subsidy than the \$1,000 start-up benefit because it applies to *all periods with contributions*, not just the initial period. In effect, the 4-percent employer contribution is subject to ETE treatment—contributions and withdrawals are tax-exempt, but accrual of income is taxable.

Regarding the \$5,000 maximum housing subsidy, the median house price in March 2004 was \$240,500 (Real Estate Institute of New Zealand, 2004). Given that individuals can generally borrow 80 to 95 percent of the house value individuals will need to accumulate savings amounting to at most 20 per cent of the house value or \$48,010 at the median price. The \$5,000 subsidy could provide as much as a fifth of the required fund because a married household can qualify for as much as \$10,000, i.e., \$5,000 for each spouse in the household.¹⁷ But the subsidy

¹⁵ The Specified Superannuation Contributions Withholding tax (SSCWT) is withheld from employers' contributions to a typical pension plan. SSCWT is imposed at rates ranging from 21% to 33%, depending on the marginal tax rates applicable to prior years' earnings. For more information about SSCWT, visit <http://www.taxpolicy.ird.govt.nz/publications/files/sscwtpaper.doc>.

¹⁶ The average weekly income from wages and salaries is \$592 in June 2005 or \$30,784 with 52 weeks of work. At this earnings level, the marginal income tax rate is 21 percent (<http://www.taxpolicy.ird.govt.nz/publications/files/sscwtpaper.doc> and <http://www.ird.govt.nz/income-tax-individual/incometaxfaq.html>). This calculation then assumes that the employer decides whether to pay \$30,784 in wages and no fringe benefits to the employee or to pay \$29,553 in wages and provide \$1,231 (4 percent of \$30,784) as employer contributions to the employee's KiwiSaver account. The worker will save 21 percent of the \$1,231 employer's contributions or \$259 in taxes on the reduced wage payment, while the employer, unlike under current New Zealand law, will not have to pay a 21 percent fringe benefit tax on the \$1,231 contributed to the employee's account.

¹⁷ See "The Basic Facts When You Shop for a Mortgage" at <http://www.realestate.co.nz/resources/residential/the-basic-facts-when-you-shop-fo> for information on home mortgages.

for many first time homebuyers will be less than \$5,000, and often substantially less, because of restrictions based on household income, regional house prices, and the length of time an individual participates in KiwiSaver before the time of withdrawal. Many households will not qualify for any subsidy at all and many others will qualify for only some, but not all, of the subsidy. Moreover, households cannot withdraw the \$1,000 start-up subsidy for a down payment on a house, although they can withdraw their own savings (plus any housing subsidy they receive) for that purpose.

II.D.3. Constraints and Penalties

Based on the current version of the KiwiSaver proposal, individuals must contribute to the program as long as they work, unless they specifically ask for a temporary exemption (the “contribution holiday”). In addition, they can only make a withdrawal when (1) reaching the eligible age, (2) permanently emigrating, (3) buying a first home, or (4) facing a financial hardship.¹⁸

How these factors affect individuals’ decisions on whether to participate, how much to contribute, and how to select an investment allocation is critical to the success of the KiwiSaver program. Beyond this, it is critical to examine how the KiwiSaver program will affect households’ saving behavior. Effects on individual and national saving depend on two types of behavioral responses. The first concerns the source of KiwiSaver deposits. If individuals reduce consumption to pay for their KiwiSaver accounts, net saving will increase. If they transfer funds from other assets or increase borrowing, however, private saving will be unchanged and national saving may fall, depending on how government finances the subsidies in KiwiSaver. The second concerns the long-term effects of KiwiSaver on household saving. If ownership of KiwiSaver accounts creates a habit of saving in the long term, it could alter behavior by providing a more pro-saving culture. It will also be of interest to assess the impacts of the KiwiSaver program on the superannuation market, the financial sector, and the economy. Findings from the evaluation will help policymakers to amend the KiwiSaver program to achieve its highest effectiveness. The remainder of this report reviews what the savings literature suggests about potential effects of KiwiSaver and discusses implications of that literature on how to evaluate the effectiveness of the KiwiSaver program.

¹⁸ The eligible age for KiwiSaver participants to withdraw funds is the Superannuation age (currently age 65) or 5 years after joining the KiwiSaver program, whichever comes later. Significant financial hardship includes situations in which individuals are unable to afford minimum living expenses, have trouble with mortgage payments on primary residences, or face financial difficulty due to disability, sickness or death of themselves or their family members. See the KiwiSaver Act 2006 (<http://www.taxpolicy.ird.govt.nz/publications/files/200640.pdf>) for more details.

III. Studies Relevant to Enrolment, Contribution Levels, and Asset Allocation in KiwiSaver

III.A. Introduction

A principal reason people save during their working years is to accumulate enough assets to allow them to enjoy a comfortable retirement. After retiring from their career jobs, people have a number of sources of support, including post-retirement earnings, income from publicly provided superannuation plans, income from employer-provided superannuation plans, other saving, and support from family members. Saving more during their high-earning years can reduce people's risk of declining living standards at older ages, reduce their dependence on government and family support, and enable them to stop working earlier. Moreover, higher private saving helps maintain domestic investment and economic growth and reduces a nation's dependence on external sources of finance.

To encourage saving for retirement, governments throughout the world have provided special tax benefits and other incentives both to employer-sponsored superannuation plans and to individual retirement saving vehicles outside of employer-sponsored plans. Measuring the effectiveness of these saving incentives requires answers to two separate, though related sets of questions. The first set of questions relates to participation in the plans themselves. Subsidies for saving incentive plans do not work unless at a minimum they induce people to participate in the plans and the extent to which they boost retirement incomes will depend on the level of contributions and how those contributions are invested. The second set of questions relates to how participants finance their contributions to the incentive plans. Favored saving vehicles will not increase saving if individuals finance their contributions simply by transferring assets from other, non-tax favored accounts, thereby reducing other savings, or by borrowing. To boost saving, the incentives must raise *net* saving, or put another way, they must induce people to reduce current consumption in order to take advantage of the incentives that the plan provides to boost future retirement income.

In this section, we review the principal studies that examine factors that influence participation in, contributions to and asset allocations within saving incentive programs. These studies provide insights on what policy tools might be most effective in encouraging higher and more broad-based participation, higher contributions, and better investment choices within the plans. Studies that examine the extent to which contributions to saving incentive plans increase net saving are discussed in Section IV.

III.B. Types of Studies

The studies reviewed in this section can be divided into two groups, based on the type of data they use. The first group of studies uses publicly available data from household surveys. The second group uses plan-specific data from employers who have implemented particular types of plans or from saving experiments. Each set of studies has strengths and weaknesses.

The studies that use publicly available household survey data include, among others, Milligan (2002) and Munnell, Sunden, and Taylor (2002). Public household survey data contain substantial information about demographic characteristics and other sources of income of both participants in plans and non-participants, enabling researchers to gain substantial insights about determinants of participation rates and contribution levels. They are based on weighted representative samples, from which it is possible to make inferences about the behavior of the entire population. But the public data sets contain only limited data about characteristics of retirement saving plans that employers offer, so they do not enable us to learn much about how variations in plan parameters affect participation.

Milligan (2002) and Munnell, Sunden, and Taylor (2002) treat participation as a binary choice. They use probit regression analysis to estimate how characteristics of individuals (age, income, education, gender, race) and characteristics of saving programs (employer's contributions, ability to borrow against the accumulated funds) are related to the probability of participation. Because details of retirement saving programs often cannot be observed for non-participants, these program details are often not included as explanatory variables in the equations predicting participation. Linear regression models are then used to estimate the effects of the same variables on contribution levels, conditional on participation. The studies that use public survey data typically do not have enough available data to estimate the effects of individual household characteristics on asset allocation within plans.

The second group of studies relies on plan-specific data, usually provided by companies that implemented the retirement saving programs or by the program administrator of an experimental program (Beshears et al. 2006; Duflo et al. 2005; and Thaler and Benartzi 2004). These studies can examine how specific details of retirement saving plans affect outcomes (the participation rate, the level of contributions, and the asset allocation choices). The data contain considerable detail on the behavior of participants, including contributions and asset allocations within the plan, but typically the studies have little or no data available on many relevant characteristics of participants, including their other sources of income and wealth holdings outside the plans. In addition, it is usually not possible to extrapolate the findings to the general population because the sample of plan participants is not representative of the entire population.

Studies in this second group generally compare participation rates, contribution levels and asset allocations between two groups of individuals who are offered retirement saving plans with different characteristics. The differences between plans available to the two groups could be either differences in default rules for participation, contribution levels or asset allocations or a difference in the incentives provided, such as the size and structure of the subsidy or whether or not there is a subsidy at all. Because the two groups of individuals who are being compared are relatively similar to each other, these studies simply compare observable outcomes using descriptive statistics. For example, they may compare the average participation rate or contribution level of the two groups or participation rates and contribution levels at different percentiles of the distribution. Some studies (Madrian and Shea 2001; and Duflo et al. 2005) also use an ordinary least squares regression analysis to estimate the relationships of characteristics of plan design and individual characteristics (such as age, salary level, and number of years with firm) on their choices. The differences in behavior between the groups offered different plan options in these studies are often very striking.

III.C. Principal Findings

Three main findings emerge from the studies reviewed. First, both participation rates and, to a lesser extent, the level of contributions vary positively with the level of subsidy. Second, default rules have a major influence on participation rates, contribution levels and asset allocations. Participation rates in a savings plan are much higher when employees are required to opt out of the plan instead of opting in, and a majority of employees contribute at the default level and allocate assets as specified by the default, even though they are allowed to contribute other amounts and allocate their assets differently. Third, how well individuals understand the features of the plans and their benefits play a crucial role in determining the outcomes.

III.C.1. Incentives Affect Contributions

The best study illustrating the effect of incentives on contributions is Duflo et al. (2005). The researchers use data from a randomized experiment that offered some participants additional subsidies to contribute to an individual retirement account (IRA) program.¹⁹ The use of experimental data addresses the concern that individuals who contribute to accounts may systematically differ in their preference for saving from non-contributors. In the study, two groups were randomly selected and then one group was provided incentives, which in some experiments varied among individuals within the group, while another group was not provided any incentives. The authors find that participation in and contributions to IRAs increases as the size of incentives provided increases. They also find that, when controlling for the level of incentives, outcomes vary with individuals' observable characteristics. In particular, participation rates and contributions are higher for married tax filers and tax filers with a savings account or positive investment income. Participation rates also increase with income. Finally, the authors report similar, although less pronounced, findings when investigating the Saver's Credit program in the United States, which provides a tax credit to low-income households who participate in the IRA program.

Another study with a similar finding, but very different methodology is Milligan (2002). He finds that marginal income tax rates and participation in the Registered Retirement Savings Plan (RRSP) program—a tax-deferred retirement saving program in Canada—are positively related. Mulligan compared participation with changes in marginal tax rates over time. Participation in RRSP was higher when marginal tax rates were higher, with all other observable influences held constant.

It is not surprising that incentives would encourage people to participate in saving incentive plans, such as IRAs and the RRSP plan, because saving inside and outside of a plan can be viewed as close substitutes. In Section IV below, we discuss the literature that considers whether the contributions in retirement saving programs represent new saving or simply a reallocation of existing savings to gain a tax benefit.

¹⁹ Under the IRA program in the United States, eligible individuals may deduct contributions to IRAs up to a certain limit and pay no tax on income within the plan. Individuals are taxed when withdrawing principal or interest after age 59 ½ and must pay an additional penalty for early withdrawals (before age 59 ½). IRAs provide little incentive for saving to low-income individuals in low income tax rate brackets, but the experiment offered additional matching grants for depositing tax refunds in an IRA.

III.C.2. Default Rules Affect Participation Rates, Contribution Levels, and Asset Allocations

Recently, there have been a large number of studies that examined the influence of default rules on participation in employer-sponsored saving plans. These studies examine participation in 401(k) plans in the United States. 401(k) plans are employer-sponsored retirement saving programs in which employees are allowed to deposit a portion of their pay (up to a specified limit). The amounts deposited are exempt from income tax (although not exempt from payroll tax), income accrues tax-free within the plans, and withdrawals are taxable. Employees may roll over their 401(k) assets into tax-deferred IRAs when they change jobs. Often employers encourage participation by matching contributions up to a limit or contributing a fixed percentage of earnings for all participating employees.

Beshears et al. (2006) provide an excellent review of the literature on default options, including studies by the authors of the review paper. They report that participation increased substantially when enrolment into the 401(k) program was made the default (opt-out) in place of the usual opt-in rule with non-participation as the default. In addition, most individuals contributed at the default levels even when they could have benefited more from the tax benefit if they chose to contribute up to the legal limit. This finding holds even when the default level of contributions is relatively high, at 6 percent of employees' earnings in one experiment, instead of 3 percent in an earlier experiment. Thaler and Benartzi (2004) report on unique retirement saving plans they developed to encourage growth in 401(k) plan participation and contributions. In their plans, individuals can choose to participate in a program that increases the percentage of earnings they contribute to a 401(k) plan over time, with an option to opt out from the program at any point. At the beginning of the program, individuals who participated in the program had a relatively low level of contributions, compared with other individuals. After four years, the program participants had a much higher contribution rate on average and very few opted out of the program.

Regarding asset allocation, Beshears et al. (2006) and Madrian and Shea (2001) show that a majority of participants in the 401(k) programs studied chose the default allocation of their investments even when they could choose other allocations. In particular, Madrian and Shea (2001) study a 401(k) plan of a U.S. private company. After periods without any default, the plan set a default of investing all contributions in a money market fund. This default rule applied to employees hired after the date when the rule was imposed, but did not affect existing employees. The newly hired employees were allowed to invest in any of the nine available funds (including "a money market fund, a bond fund, a stable value fund, a combination stock/bond balanced fund, several stock mutual funds, and a foreign stock fund"). Madrian and Shea found that approximately 80 percent of new employees deposited all their contributions in the money market fund, compared with only about 6 percent of existing employees.

Similarly, Cronqvist and Thaler (2004) show that a majority of participants in the Premium Pension program—a mandatory retirement saving program in Sweden—actively made their own investment choices when active choices were encouraged through extensive advertising. In contrast, most participants chose the default portfolio option when the extensive advertising was abandoned. We discuss this study in more detail below.

III.C.3. Knowledge Matters

A number of studies have found that financial knowledge affects choices about participation, contributions, and portfolio choices while others have speculated that lack of understanding of the programs explains some decisions they observed. Cronqvist and Thaler (2004) examine different generations of participants in the Premium Pension program of Sweden. When the program was first implemented in 2000, a vigorous advertisement campaign was used to encourage participants to make an active choice of their investment portfolio. The advertisement was fairly limited afterward. Cronqvist and Thaler find that 66.9 percent of the participants in the first generation chose an investment option different from the default, while only 8.4 percent of a subsequent generation did so. They suggest that the higher degree of advertisement by the government and the fund providers during the initial stage of the program may have influenced the differing outcomes.²⁰

Duflo et al. (2005) cite the influence of savers' lack of understanding of the Saver's Credit program when trying to reconcile findings about participation in their IRA experiment and the actual IRA participation in response to the Saver's Credit. In particular, they argue that many households who would have been expected to contribute to an IRA to receive the Saver's Credit may have failed to do so because of the credit's complexity. Similarly, Beshears et al. (2006) suggest that individuals may have chosen the default option offered because of the complexity involved in making saving decisions. Finally, Thaler and Benartzi (2004) suggest that financial advisers play a crucial role in inducing individuals to participate in the retirement saving programs they examined.

III.D. Implications for KiwiSaver and How to Evaluate It

The studies show that incentives, default rules, and financial education all influence participation in and contributions to retirement saving plans and the latter two also influence asset allocation choices. In particular, default rules have surprisingly large effects on behavior, given that they have no effects on the economic benefits of participation. KiwiSaver relies more on the default rule than on financial incentives as a means of encouraging employee participation, so it could produce substantial participation in retirement plans with little government budgetary cost. The studies also show that education can have a key effect on outcomes, suggesting the importance of an active program of financial education to accompany the introduction of KiwiSaver.

In terms of evaluating KiwiSaver, the studies reviewed offer three insights. First, to assess the extent outcomes are influenced by the incentives that KiwiSaver provides, it is necessary to have detailed information on how different firms implement KiwiSaver. Only some employers will contribute to KiwiSaver and contributors may deposit different amounts or subsidize employee participation by different amounts. Second, to evaluate the effectiveness of the program, it is crucial to measure the degree to which individuals understand the program. Third, to control for factors that may influence employee participation, contributions and asset allocations, it is essential to collect information regarding individual characteristics and

²⁰ Paradoxically, people who actively selected their investments fared worse over the time period studied than they would have done with the default choice.

supplemental sources of retirement income and match data on individual characteristics to data on participation, contributions, and asset choices.

Ideally, a data set for the KiwiSaver evaluation in the context of participation, contribution and asset allocation must include information on these outcomes. In addition, it should include information relevant to the program, both objective—such as any existing Superannuation scheme the employer offers, employers' KiwiSaver contributions, and alternative resources of retirement income of the employee—and subjective—such as employees' understanding of the program and their general financial knowledge. Even though the KiwiSaver program is practically universal, outcomes may vary among participants, as suggested by the studies reviewed here, simply because of differences in characteristics of individuals, their understandings of the program, and the incentives to participate in KiwiSaver and other superannuation benefits that employers offer.

Table 3.1 Studies Relevant to Estimating Determinants of Enrolment in KiwiSaver and Level of Participation

Study Title	Author(s)	Program [Country]	Main Questions and Outcome of Interest	Data [Country]	Methodology	Findings	Advantages and Limitations	Relevance
The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States	Beshears, Choi, Laibson and Madrian	401(k) [USA]	How default rules in saving plans affect participation, contribution levels and investment choices?	Various data sets, mostly about 401(k) plans of US private companies [USA]	Literature Review, including authors' studies	Participation, contributions and investment choices selected by individuals strongly resemble defaults.	Advantage: The paper collects evidence based on various studies using plan-specific data. Limitation: There are very limited insights on how the findings apply to the general population.	The paper offers strong evidence default rules affect outcomes and assesses alternative explanations for why this happens. The findings provide insights on how to improve KiwiSaver.
Design Choices in Privatised Social Security Systems: Learning from the Swedish Experience	Cronqvist and Thaler	Premium Pension [Sweden]	How did actively chosen investment choices perform compared to the default investment choice?	2000-2003 Morningstar funds' holdings [Sweden]	Descriptive statistics	With limited advertisement, only 8.4% chose a non-default option. With extensive advertisement encouraging individuals to choose their investment choices, 66.9% chose a non-default choice. Most non-default choices had performed well in recent years but, as it turned out, returns on the default choice were on average higher than returns on actively chosen choices.	Advantages: The study utilizes a unique data set on investment behavior and outcomes in the presence of a default rule combined with education. Limitation: The study cannot evaluate whether the choices were optimal <i>ex ante</i> .	The study highlights the relative influence of default investment allocations with and without participant education. It illustrates, however, that investment outcomes are unpredictable and the recent past is not necessarily a good predictor of the future.
Tax-preferred Savings Accounts and Marginal Tax Rates: Evidence on RRSP Participation	Milligan	Registered Retirement Savings Plan [Canada]	How marginal tax rates affect participations in the savings program?	Family Expenditure Survey from various years between 1982-1996 [Canada]	Probit regressions	There is a positive relationship between participation in the saving program and marginal income tax rates. However, much of the variation in participation rates is left unexplained.	Advantage: The study makes use of data on the changes in income tax rates across time to explain changes in participation. Limitation: The study is based on repeated cross-section data, so it cannot control for differences among individuals in preferences for saving.	The study finds that tax incentives are related to participation, but emphasizes that much of the variation in the participation decisions cannot be explained.
Saving Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block	Duflo, Gale, Liebman, Orszag and Saez	IRAs, and Saver's Credit [USA]	How do individuals utilize savings incentives?	2005 data from a tax preparer [USA]	Descriptive statistics and ordinary least squares	Stronger incentives induce individuals to participate and contribute more, especially when the incentives are easily understood. The study also reports that many individuals do not take advantage of the incentives.	Advantage: The study uses data with clearly designed control and experiment groups. Limitation: Unobserved characteristics limits the insight on why individuals did not participate even with the clear incentives.	The study emphasizes the usefulness of data with a clear control and experiment design for studying participation and contribution decisions.

Note: Some of these studies may appear in another section of this report.

Table 3.2 (continued) Studies Relevant to Estimating Determinants of Enrolment in KiwiSaver and Level of Participation

Study Title	Author(s)	Program [Country]	Main Questions and Outcome of Interest	Data [Country]	Methodology	Findings	Advantages and Limitations	Relevance
The Power of Suggestion: Inertia in 401(k) Participation and Savings Behaviour	Madrian and Shea	401(k) [USA]	Do default rules in a saving plan affect participation, contribution levels and investment choices?	1998-2000 data from a private company [USA]	Descriptive statistics and ordinary least squares regressions	Participants stayed with the default options of participation, contributions and asset allocation choices. Over time, some of these participants selected other choices but the majority of them did not make any change. This is especially true for young and relatively low-earning individuals.	Advantage: The study is among the first to make use of a unique data set not publicly available to study relationships between defaults and outcomes. Limitation: The study offers limited insight on the reasons individuals usually do not deviate from the defaults.	The study offers an insight that the implementation scheme chosen can substantially affect outcomes. In particular, it suggests that defaults matter, especially regarding participation and persistence of contributions.
What Determines 401(k) Participation and Contributions?	Munnell, Sunden, and Taylor	401(k) [USA]	What Determines 401(k) Participation and Contributions?	1998 Survey of Consumer Finances [USA]	Probit and ordinary least squares regressions	Participation in employer-sponsored tax-deferred saving plans is positively correlated with age, income, and job tenure and negatively correlated with defined benefit pension wealth. These factors are not significantly correlated with contributions. Net worth and length of financial planning horizon are positively correlated with participation and contributions. Finally, the presence, but not the size of employers' matches and the ability to borrow from the plan account are positively correlated with contributions.	Advantage: The Survey of Consumer Finances contains very detailed information on individuals, especially in terms of income and wealth. Limitation: The study is based on cross-section data, and as a result cannot control for differences in individual preferences for saving. The absence of information about plans that were offered but not selected limits the insights on how details of the plans affect participation and contribution levels.	The study offers a general overview of the participation and contribution literature, especially on the factors that should be relevant to the decision. It shows that older and higher-income individuals with longer job tenure are more likely to participate in incentive plans, but it does not show how different groups would react to the default rules in KiwiSaver. It also describes how the 401(k) program works, which is critical to the understanding of the findings of studies based on this program.
Save More Tomorrow™: Using Behavioural Economics to Increase Employee Saving	Thaler and Benartzi	401(k) [USA]	Can sophisticatedly designed savings programs increase participation and contributions?	Data from various periods between 1998 and 2002 from three private companies [USA]	Descriptive statistics	With the same saving incentives, more participation and higher contributions in a saving plan can be achieved by modifying the defaults of the program such as by setting participation as a default instead of non-participation, and setting default levels of contribution rates and raising them over time.	Advantage: The study utilizes data from a unique implementation of the saving programs to answer their questions. Limitation: Participants could be savings less outside of the plan. Thus, it is inconclusive whether the program increases their saving overall.	The study offers an insight that the implementation scheme chosen can substantially affect outcomes. In particular, it suggests that defaults matter, especially regarding participation and contributions.

Note: Some of these studies may appear in another section of this report.

IV. Studies that Estimate Attitudes and Behavioral Responses

IV.A. Introduction

In this section, we review studies that assess the extent to which contributions by participants in retirement saving programs represent net new saving, beyond their decisions specific to the programs. We also briefly discuss the subject of attitudes toward saving, which receives very little attention in the literature.

Many of the studies examine the effects of individual retirement account (IRA) and 401(k) accounts in the United States. IRAs are special saving accounts that receive EET treatment, instead of the TTE treatment afforded to regular saving accounts. Roth IRAs are an alternative form of IRA that receives TEE treatment. Eligible individuals may contribute up to a maximum amount (\$4,000 per taxpayer in 2006, with additional “catch-up” contributions if over 50) to IRAs. Taxpayers are eligible to contribute to deductible or Roth IRAs if they do not have access to an employer-provided pension plan or if their incomes are below certain limits.²¹ Named after the tax code section that authorized them, 401(k) plans are voluntary salary reduction plans. If an employer establishes a plan, employees may deposit a fraction of their earnings to the plan, up to a maximum limit (\$15,000). Many employers provide matching deposits to encourage their employees to participate.²² These employer-sponsored plans also receive EET treatment under the U.S. federal income tax. Other studies examine the Individual Saving Account (ISA) program in the United Kingdom and the Registered Homeownership Savings Plan Program (RHOSP) in Canada.

IV.B. Methodological Issues

IV.B.1. Designing an Ideal Experiment

Measuring how the presence of a retirement saving program affects saving requires knowledge of how people would behave with and without the program. An ideal experimental design for a study would randomly assign identical individuals into two groups—a *treatment* group that is allowed, but not required to participate in the program—and a *control* group that is not allowed to participate. If the two groups of people were similar, one could infer that the control group would behave the same as the treatment group if allowed to participate in the saving program and provided with the same incentives. The effects of the program could then be measured by comparing outcomes (saving, net financial wealth, net worth, consumption) of the treatment and control groups. Unfortunately, the studies we review, which are representative of the best studies in the literature, do not have access to data for such an ideal controlled experiment and instead must make inferences from “natural” experiments in the real world.

²¹ Individuals who are not eligible to contribute to IRAs may contribute to non-deductible IRAs; in these accounts, contributions come from after-tax income. Income within the accounts accrues tax-free, but the portion of withdrawals that comes from accrued income in the account is taxable.

²² 401(k) plans are subject to complex non-discrimination rules that require broad-based participation by employees at different pay levels for a plan to qualify for tax-favored treatment.

IV.B.2. Estimation in the Real World: The Problem of Unobserved Heterogeneity

Typically, studies do compare saving behavior and wealth accumulation of individuals with and without access to particular retirement saving plans. The studies also adjust for differences in observed characteristics of individuals, such as age, income, gender, and level of education. But they all confront the problem that, even after one controls for observed differences in individual characteristics, people still differ in their preferences for saving. The inability to adjust for unobserved characteristics such as the taste for saving is often referred to as the problem of “unobserved heterogeneity.”

For example, suppose we compare the behavior of two individuals with the same age, income, level of education and other observable characteristics. The first individual is eligible for and chooses to participate in a subsidized saving program, while the second is ineligible to do so. We observe that the eligible individual saves more than the ineligible individual. We might like to conclude that the subsidy in the saving program is the reason the first individual saves more, but without additional information, we cannot reach that conclusion. If these two individuals were actually identical in every respect, the information above would indicate that the saving program increases private saving. The eligible individual might find it optimal to save more, however than the ineligible individual even in the absence of the program if he or she had a higher “taste for saving.” In this case, instead of increasing net saving, the subsidy in the saving program might have simply allowed the eligible individual to increase her assets without sacrificing any additional current consumption by saving within the subsidized program instead of outside of it. As Poterba, Venti, and Wise (1996) note, “no method, other than a perfectly run, randomized, controlled trial, can control for every possible type of heterogeneity.”

IV.C. Research Approaches

Faced with the imperfect data available to them, researchers have used different methods to address the issue of unobserved heterogeneity. They all must make two decisions, which are not necessarily mutually exclusive: (i) how to select from the available data a sample that is relatively homogenous (*sample selection*), and (ii): how to describe the relationships between the outcomes of interest and the relevant explanatory variables and how to estimate how individuals would behave if they were faced with different incentives (*empirical specification*).

IV.C.1. Sample Selection

The goal of sample selection is to identify a sample of individuals with relatively similar tastes for saving, some of who have access to the saving program, while others do not. With such a sample, the observed differences in behavior between individuals with different exposure to the saving program can be used as a measure of the program’s effects. Three sample selection approaches often used in the literature are (i) *within-group*, (ii) *between-group*, and (iii) *cohort*. We discuss the details and the advantages and disadvantages of each approach in turn.²³ It should

23 Some studies also combine or refine these approaches. For example, Poterba, Venti and Wise (1995) compare individuals who were eligible to participate in a 401(k) program to ineligible individuals (which is a between-group

be noted that researchers must make a judgment on what approach is best for their study, given the advantages and disadvantages of each approach when applied to the dataset they are using.

The *within-group* approach compares behavior of individuals in the *same* group in different time periods. This approach is appealing because it is plausible that individuals in the same group have similar preferences across time. Even so, a comparison between behaviors of the same individuals across time may not tell much about the effect of a saving program. Observing that an individual saved more after participating in a 401(k) program does not necessarily establish that the 401(k) program increased private saving because the individual may have found it optimal to increase saving with or without the 401(k) program.²⁴

The *between-group method* compares different groups of individuals at the same point in time. Individuals are grouped according to their degree of exposure to the saving program studied. A prime example is the comparison between individuals based on their eligibility to participate in a 401(k) plan.²⁵ This approach assumes that employees who are not eligible for a 401(k) do not systematically differ in tastes for saving from employees who are eligible because only employers can offer 401(k) plans. Put another way, this approach assumes employees in these two groups are identical and their employment choices are random with respect to 401(k) eligibility. If the assumption is correct, researchers can compare the two groups as if they had ideal experimental data. The assumption that 401(k) eligibility is random, however, may not hold in reality. Employees who find it optimal to save more and thus benefit more from participating in a 401(k) program may actively seek a job that provides such an opportunity or demand their employers to provide one. (Indeed, employers who incur the administrative costs of offering 401k plans must believe it is an attractive tool in recruiting employees.) As a result, the pool of employees eligible for the program may be very different from the pool of ineligible employees, even after controlling for differences among the groups in observed characteristics.

Finally, the *cohort method* compares individuals with similar characteristics including age, but not year of birth. The idea is that, given a starting date of a retirement saving program, the later birth cohort has been exposed to the programs longer when they have attained the same age as the earlier cohort. As a result, the difference in saving or wealth between groups can be used to measure the effects of the longer exposure to the saving incentive program. This approach addresses the disadvantages mentioned in the within-group and between-group approaches, i.e. that the within-group comparison does not capture changes in saving propensities as people age and that the between-group comparison may compare individuals who are fundamentally very different from each other.²⁶ However, this approach has its own drawback in that the observed

approach) across time (which is a within-group approach), resulting in an analysis that resembles the well-known difference-in-difference approach. Engen and Gale (2000) refine their analysis by conditioning participation on individuals' earnings, under the logic that effects of 401(k) programs may vary with earnings.

²⁴ Engen, Gale, and Scholz (1996) observe that "The main problem with this test is that it does not control for ... period-specific individual or aggregate shocks to saving." Poterba, Venti, and Wise (1996) comment that "if an individual's saving commitment changes at the same time that participation status changes ... this estimate will capture the taste change as well as the participation effect."

²⁵ Another example is the comparison between households participating in a 401(k) plan and households participating in the IRA program but not eligible for a 401(k) plan (Engen et al. 1994). The idea is that both these groups of households actively participate in a retirement saving program and should therefore be comparable in terms of preferences for saving.

²⁶ "The comparison of the assets of 401(k) eligible and non-eligible households, for example, may be affected by differences in underlying saving behavior of the two groups ... Nor are the [within-group] estimates confounded by

differences between cohorts may be a result of factors outside of the saving program. For example, economic variables, such as growth in stock prices and interest rates, will differ in different time periods, resulting in different rates of wealth accumulation for different cohorts. In general, one cannot simultaneously estimate age, cohort, and time-period effects. For example, when holding age constant, one cannot distinguish between cohort effects and time-period effects.²⁷

IV.C.2. Empirical Specification

Aside from the sample selection issue, researchers must also determine what specific measured outcomes should be the focus of the studies and how to represent the relationship between these outcomes and relevant explanatory factors, including characteristics of households and characteristics of the saving program.

Saving cannot be measured directly; it is the difference between income and consumption and produces increases in wealth. Thus, the outcome measures commonly studied in the literature to estimate whether a program increases net saving are consumption and a measure of asset accumulation. The use of consumption is based on the mathematical identity that, at a given level of income, lower consumption is equivalent to more saving. Thus, the effect of a saving program on private saving can be measured by estimating the relationship between consumption and activities related to the program. A measure of wealth is used because net saving, combined with the rate of return on saving, produces higher wealth. Increased household wealth over time is the goal of saving incentive programs.²⁸ If individuals finance their contributions to a saving program by transferring assets or reducing saving in assets outside the program or by borrowing, however, their net wealth will not increase faster than it would have absent the program.

Saving programs may also affect other dimensions of behavior, such as labor supply or an individual's investment strategy. Individuals may retire earlier (e.g., work less over their lifetime) if they accumulate more wealth and may alter the allocation of their investment portfolios. The literature on the effects of saving incentives devotes little attention to their effects on labor supply or portfolio allocation, although there is an extensive literature on both retirement decisions and

the possible ... 'coincidences' that individuals who had just decided to save took advantage of the emergence of IRAs" (Poterba, Venti and Wise, 101–102 with correction from "cohort " to within-group).

²⁷ For example, Poterba et al. (1996) show that a group of individuals ages 60 to 64 in 1991 accumulated approximately \$80,000 more in financial wealth than a group of individuals at the same age in 1984, and that the difference was concentrated in the assets in IRA and 401(k) plans, with virtually no difference in other forms of financial assets. They conclude that this is a consequence of the younger cohort having a longer exposure to the IRA and 401(k) programs. However, Engen et al. (1996), point out that the difference may be a result of the stock market boom and changes in real interest rates between 1984 and 1991. In addition, they note that: "A fundamental problem with cohort analysis is that it is impossible to identify separate age, time and cohort effects without making strong assumptions. Cohort effects apply to groups born in a common period. Time effects affect all groups at a point in time. Age effects refer to behavior at different points of the life cycle. Problems arise because age equals time minus cohort, so the three variables provide only two pieces of information. Thus, 'cohort analyses' reflect an unknown combination of age, time, and cohort effects." (Engen et al. 1996, 122)

²⁸ Various measures of asset accumulation have been employed. Financial wealth is used because of its liquidity, i.e. that it is easy to transfer part of financial wealth into a retirement saving program. A broader measure of wealth, such as non-pension net worth (usually defined as financial assets plus real assets), is used under the premise that individuals may also finance their contributions out of real assets, either through acquiring less or borrowing against real assets.

portfolio allocation. Studies of retirement behavior, for example, do consider variables such as wealth and formulas for accruing wealth within defined benefit pension plans as determinants of the timing of retirement, but do not specifically relate the retirement decision to the availability of tax-deferred saving plans.²⁹

Researchers must also determine what factors are relevant to the selected outcome and how these factors and the outcome are related. In other words, the researchers must specify the functional form of the empirical specification.³⁰ This is a challenging task because little is known about individuals' saving decisions. As a result, the empirical specifications employed in the studies reviewed are intuitively motivated and not rigorously derived from a theory simply because there is no consensus theory on saving.³¹ In any study, the empirical specification imposes constraints that reflect how the researcher believes the saving program could influence the outcome and how individuals would behave if they were exposed to the program differently.³² Because of uncertainty about the appropriate study design, researchers often use multiple empirical specifications to examine whether their findings are sensitive to their choice of specification.

IV.D. Summary of Findings on Effects of Saving Programs on Net Household Saving

Given both the basic uncertainty about what theory best explains saving and the difficulty of identifying comparable groups of participants and non-participants in saving programs, it is not surprising that researchers have not reached a consensus on the extent to which incentive programs increase saving. Some researchers (Chernozhukov and Hansen, 2004; Engelhardt, 1996; Poterba, Venti and Wise, 1996) have found that the saving programs they studied substantially increased net saving. In contrast, influential research summarized by Engen, Gale, and Scholz (1996) concludes that retirement saving programs in the United States do little to

²⁹ A number of studies have also examined portfolio behavior within 401(k) plans. For example, see Mottola and Utkus (2006)

³⁰ For example, Engen and Gale (2000, 15–17) employ four functional forms of wealth (financial wealth or net worth)—level of wealth, wealth-to-earnings ratio, log of wealth, and log of wealth-to-earnings ratio. The justification for using level of wealth is that it is a natural choice in the literature. They use wealth-to-earnings ratio to rescale the effects of 401(k) programs on individuals with different earnings. They use logs to examine a percentage change of wealth instead of a change in level because individuals may have different amount of assets at the beginning of the study and as a result may have different changes in the level of wealth even though they have a similar growth rate. Some studies (Attanasio and DeLeire 2002; Chernozhukov and Hansen 2004; Engen and Gale 2000) also focus on other points in the distributions of the outcomes in addition to the mean or median values of the distributions.

³¹ Broadly speaking, there are two competing sets of theories on saving decisions. The first set of theories views individuals as rational and forward looking. Individuals save in anticipation of future consumption. This view has come to be known as the life cycle hypothesis. The second set of theories views individuals as capable of acting irrationally (due, for example to a lack of self-control or lack of financial sophistication) and caring less about their future than they would if they were consciously optimizing the pattern of consumption over their lifetime. In this case, saving decisions are a product either of ignorance or lack of discipline (procrastination). The view that savers, or economic agents generally, may be irrational has come to be classified under the general label of “behavioral economics”. Finding a common empirical specification that admits of both views and at the same time helps distinguish them empirically has proved to be very difficult, if not impossible.

³² For example, returns on 401(k) and IRA accounts accumulate tax-free, but assets in 401(k) and IRA accounts are subject to future tax. Returns on other assets in general are taxed but these assets are free of future tax. An empirical specification that compares wealth of 401(k) and IRA participants and wealth of the others must specify how the participants would have accumulated wealth if they had not participated in these programs.

increase net saving. Instead they conclude that individuals take advantage of the programs by reallocating their portfolios. In a subsequent study, Engen and Gale (2000) replicate the result of Poterba, Venti, and Wise (1995) that most 401(k) contributions are new saving and then find that at best 30 percent of 401(k) balances represent new private saving when they use alternative specifications. A third group of studies has found that retirement saving programs increase net private saving modestly, with the increases confined to selected groups (Attanasio and DeLeire, 2002; Attanasio, Banks, and Wakefield 2005; Engen and Gale, 2000). Those found to save more are relatively less well-to-do individuals, such as individuals with low earnings (Engen and Gale 2000) or without housing assets (Benjamin 2003).

IV.E. Effect of Saving Programs on Attitudes

The discussion so far has focused on studies that estimate the short- and medium-term effects of saving programs on household behavior. Policymakers may also be interested in whether the programs affect attitudes as well as behavior because it is through a change in attitudes that a “pro-saving culture” may be created and saving rates lifted permanently.

Put another way, a saving program may induce individuals to save more either by providing the individuals better incentives to save, given fixed innate preferences and financial knowledge, or may influence saving by changing attitudes and improving financial sophistication. Participation in a saving program may increase an individual’s financial sophistication over time either because the program itself provides financial education or because of learning gained from first-hand experience with financial markets. Unfortunately, the literature on saving programs offers little insight on this how saving programs affect financial knowledge. The only study that touches on this topic is Pence (2002), who found suggestive evidence that 401(k) participants gained greater awareness about retirement saving over time. The gains in awareness, however, were larger for individuals who began with a higher level of awareness. The study does not provide any insight as how any increased financial awareness may have altered subsequent saving decisions.³³

IV.F. Implications of Literature for KiwiSaver

The literature is inconclusive as to whether or not the saving incentive programs they examined increase net saving. Some studies find that incentive plans increase net saving, while others find that they simply cause households to shift assets to tax-favored accounts. To the extent the incentives have any impact on net saving, it is mostly likely through raising saving of people with low earnings or no access to other assets that could either be shifted to tax-favored accounts or used (such as housing) as collateral for borrowing.

KiwiSaver works differently from the saving incentive programs in the United States, Canada, and the United Kingdom. Compared with these other programs, it offers very modest

³³ MacFarland, Marconi and Utkus (2003) show wide a variation in attitudes toward savings among individuals eligible to join a 401(k) program. However, they do not examine how exposure to the program affected individuals’ attitudes, if at all.

financial incentives for participation, but instead relies on a default rule that makes people consciously opt out if they do not want to participate. While there is considerable evidence that default rules substantially raise participation (see Section III), there is no research on whether new participants induced by the default rule are more or less likely to finance their deposits by reducing consumption than other participants. In addition, because KiwiSaver provides smaller (and less costly) financial incentives than the programs studied in other countries, the default rule may not induce as much additional participation as indicated by studies in the literature.

For all these reasons, KiwiSaver has a unique design and previous research offers at best an imperfect guide to its success. The difficulty in reaching consensus in the literature on saving programs suggests the importance of carefully designing any evaluation of KiwiSaver.

Regarding an evaluation of KiwiSaver, the lessons from previous research offer three insights about an experimental design. First, to separate out the extent that outcomes are driven by unobserved differences between individuals, it is necessary to isolate treatment and control groups that are clearly comparable and collect similar data for these groups. Second, to estimate how KiwiSaver affects net saving of New Zealand employees, researchers must carefully choose an empirical specification, including selection of a well-defined outcome of interest and a characterization of how it depends on characteristics of households and the program. Third, it is essential to assess the robustness of the findings relative to changes in the definition of comparable groups and empirical specifications of the relationship between outcomes and their determinants.

To avoid the shortcomings of earlier studies, it would be desirable to conduct a nationally representative survey of selected individuals for evaluating the KiwiSaver program. The survey should have three characteristics. The data should be longitudinal, with separate surveys drawn before and after implementation of KiwiSaver. Because the KiwiSaver program is practically universal, it would be insufficient only to compare behavior among different individuals after implementation.³⁴ Second, the survey should contain measures of economic outcomes that can easily be used to evaluate the impacts, such as consumption, saving (if observable directly), and different measures of wealth accumulation.³⁵ Third, the survey should collect subjective information that helps understand the underlying reasons people choose to participate or opt out, including individuals' self-evaluation of the impacts of the KiwiSaver program on their saving behavior and their motivations to opt out from or opt in to the program. We discuss our recommendations in more detail in Section VI.

³⁴ It is likely that individuals who benefit more from participating in the KiwiSaver program will opt in to the program while individuals who find it too costly will opt out from the program. Thus, a comparison between participants and non-participants will likely find the issue of unobserved heterogeneity to be a main obstacle. As an alternative, a comparison between new employees and existing employees will be unlikely to solve the unobserved heterogeneity problem because existing employees may have very different tastes for saving than new employees.

³⁵ The survey should be very specific about the definitions of these outcomes. For example, the survey should distinguish saving from interest and dividends earned from existing assets, etc. Also, the survey should distinguish between consumption of non-durable goods and consumption of durable goods such as housing or cars.

Table 4.1 Studies Relevant to Estimating Attitudes and Behavioral Responses

Study Title	Author(s)	Program [Country]	Main Questions	Data [Country]	Methodology	Findings	Advantages and Limitations	Relevance
The Effect of Individual Retirement Accounts on Household Consumption and National Saving	Attanasio and DeLeire (2002)	IRA [USA]	Do IRAs increase private and national savings?	1982-1990 Consumer Expenditure Survey [USA]	Compares the change in consumption, change in saving rate, and change in the ratio of non-IRA financial assets to consumption between new and continuing IRA contributors	During the periods that they first joined the program, new contributors had a statistically significantly smaller change in non-IRA financial assets than continuing contributors. The difference is not statistically significant in a subsequent period. Also, 38% of IRA contributions represent new household savings.	Advantage: The study focuses on consumption to identify effects of the IRA program on saving. Limitation: Findings that new IRA contributors had a smaller change in non-IRA financial assets in the initial period of participation by itself has a limited implication on whether IRA contributions in a subsequent period represent new savings.	The study offers an alternative approach to investigate the impacts of the saving programs, namely to focus on consumption as an alternative to using a measure of wealth.
Effectiveness of Tax Incentives to Boost (Retirement) Saving: Theoretical Motivation and Empirical Evidence	Attanasio, Banks and Wakefield (2004)	IRA [USA] and ISA [UK]	Do IRAs and ISAs increase private and national saving?	1982-1990 Consumer Expenditure Survey [USA], 1998 and 2002 Family Resources Survey (FRS) [UK]	Compares the change in consumption and non-IRA financial assets between new and continuing IRA contributors; Compares descriptive statistics from FRS before and after ISA was introduced	Only small fractions of contributions are new saving.	Advantage: The study focuses on consumption to identify effects of the IRA program on saving. In addition, the study utilizes the unique data which cover the period in which ISAs was introduced. Limitation: Findings that new IRA contributors had a smaller change in non-IRA financial assets in the initial period of participation by itself has a limited implication on whether IRA contributions in a subsequent period represent new saving.	The study offers an alternative approach to investigate the impacts of the saving programs, namely to focus on consumption as an alternative of a measure of wealth. Also, the study offers a way to analyze data in a period that a saving program is introduced.

Note: Some of these studies may appear in another section of this report.

Table 4.1 (continued) Studies Relevant to Estimating Attitudes and Behavioral Responses

Study Title	Author(s)	Program [Country]	Main Questions and Outcome of Interest	Data [Country]	Methodology	Findings	Advantages and Limitations	Relevance
Tax Subsidies and Household Saving: Evidence from Canada	Engelhardt (1996)	RHOSP [Canada]	Does the Registered Home Ownership Savings Plan (RHOSP) increase household and national savings?	1978, 1985, 1984 and 1986 Canadian Family Expenditure Surveys	Compares saving between individuals before and after the program was canceled, between individuals with different tax incentives, and between individuals eligible and ineligible to the program	56% to 93% of contributions to RHOSPs represent new household saving.	Advantage: The study employs unique data to analyze the issue. Limitation: The groups of individuals being compared are not necessarily identical in terms of tastes for saving.	The study offers a way to analyze data in a period that a saving program is introduced. In particular, the study discusses how one may view such data as a close substitute for data from an actual experiment.
The Effects of 401(K) Plans on Household Wealth: Differences across Earnings Groups	Engen and Gale (2000)	401(k) [USA]	How do 401(k) plans affect households' wealth?	1984, 1987 and 1991 Survey of Income and Program Participation (SIPP)	Compares various measures of assets and wealth between 401(k) eligible and ineligible households across time and earnings groups	401(k) plans increased household saving only for households with low earnings. At best 30% of 401(k) balances are new private saving.	Advantage: The study addresses various disadvantages of existing studies. Limitation: The evidence presented still suffers from the heterogeneity issue.	The study suggests that it is important to control for observed factors that correlate with tastes for savings in order to discern the effects of the program.
The Illusory Effects of Saving Incentives on Saving	Engen, Gale and Scholz (1996)	IRA and 401(k) [USA]	Do IRAs and 401(k) plans increase household saving?	1984, 1987 and 1991 SIPP, and 1983 and 1986 Survey of Consumer Finances [USA]	Literature Review, including authors' studies	Little, if any, of contributions to IRA and 401(k) plans represent new household saving.	Advantage: The study collects evidence based on various studies to support the view that IRA and 401(k) plans have not increased household saving. Limitation: The discussions are only suggestive because the evidence presented still suffers from the heterogeneity issue.	The study offers detailed discussions on various approaches used to study the issue. It also attempts to reconcile the differences between the extreme findings in the literature.
How Retirement Saving Programs Increase Saving	Poterba, Venti and Wise (1996)	IRA and 401(k) [USA]	Do IRAs and 401(k) plans increase household saving?	1984, 1987 and 1991 SIPP, and 1983 and 1986 Survey of Consumer Finances [USA]	Literature Review, including authors' studies	A large portion of contributions to IRA and 401(k) plans represent new household saving.	Advantage: The study collects evidence based on various studies to support the view that IRA and 401(k) plans have increased household saving. Limitation: The discussions are only suggestive because the evidence presented still suffers from the heterogeneity issue.	The study offers detailed discussions on various approaches used to study the issue. It also attempts to reconcile the differences between the extreme findings in the literature.

Note: Some of these studies may appear in another section of this report.

V. Studies on Impacts of Saving Incentive Programs on National Saving

V.A. Introduction

Government-subsidized saving programs aim to increase national saving in addition to promoting retirement security of workers. A higher national saving rate raises future wealth of a country's citizens, either in the form of a larger stock of productive capital or a smaller claim on the country's resources by foreign shareholders and creditors.

National saving consists of three components—personal saving, business saving, and government saving.³⁶ Examining the impact of a saving program on national saving requires understanding of how the program affects all three components of national saving. Individual responses to incentives directly change personal saving. Business responses, such as by changing contributions to defined contribution plans, substituting defined contribution for defined benefit plans, or substituting superannuation contributions for other fringe benefits, could alter both business and personal saving. Net changes in government revenue affect government saving directly, but the changes in government saving could be offset by other changes in the tax system or public spending, depending on overall budget control rules.

Higher private wealth accumulation by participants in retirement saving plans does not necessarily translate into increased national saving for two reasons. First, larger wealth accumulation may not require increased saving from participants if, as in many countries, tax subsidies to qualified retirement accounts allow participants to receive a higher after-tax return on the same amount of net (after-tax) contributions to accounts. Second, increased private saving may come at the expense of lower government saving if tax or other incentives in the retirement saving program lead to a higher public sector deficit.³⁷

Saving incentive programs, however, could have a more favorable effect on national saving in the long run than in the short run if over time a larger share of contributions to them displaces private consumption or if the build-up of wealth in retirement accounts itself lowers the shares of their income that people consume. In addition, there could be beneficial second-order effects of incentives that studies of their direct impacts do not measure. This section of the report reviews papers that examine broader impacts of saving incentive programs on national saving. Specifically, we address three aspects of the effects of retirement program incentives on saving

³⁶ The boundary between business and personal saving can be arbitrary, however. For example, an increase in wealth (from reinvested dividend and interest income, for example) within defined benefit superannuation plans could be viewed as business saving, because businesses bear the equity risk of changes in the value of the plan's investment portfolio, or as personal saving, because the firm's employees are the ultimately beneficiaries of superannuation wealth. (If the government insures superannuation plan liabilities of firms as it does in the United States, then increases in contingent liabilities could also be viewed as negative government saving, although the United States does not do so in its accounts.)

³⁷ One potential benefit of the KiwiSaver approach of relying on the default rule as the principal way to encourage private saving is that increases in private saving could come at a relatively low cost to the government. This makes it more likely that KiwiSaver would increase both private and national saving.

that the literature has addressed: (1) second round effects on saving, (2) differences in long-run and short-run effects and (3) effects of how government finances the program³⁸.

V.B. Indirect Effects on National Saving

Increased deposits to retirement saving accounts can have complex second-order economic effects, even if depositors in the accounts simply transfer wealth from other assets or increase borrowing. The composition of depositors' portfolios will change, causing changes in relative demands for, and possibly, changes in relative yields on corporate equity, government bonds, housing, and other assets. A change in the composition of assets could have second-order effects on government revenue when income from different assets is taxed at different rates (for example, in New Zealand, capital gains on shares held for investment are tax-exempt). Any change in the portfolio composition of depositors in the accounts could, however, be offset by changes in portfolio holdings of other investors in response to changes in relative prices. For example, if depositors in accounts increase their share of wealth invested in equities, the resulting increase in the relative price of equities (or, equivalently, the fall in its relative yield) could cause other investors to shift out of equity. We are unaware of any studies that have traced out the general equilibrium effects of a shift in assets to tax-favored saving vehicles, using a fully internally consistent model.

Feldstein (1995) addresses one channel through which the use of IRAs in the United States may have produced a second-order increase in government revenue, thereby increasing national saving. Feldstein argues that increases in corporate investment through IRA accounts will raise the corporate capital stock. Because the United States still has a classical corporate tax system that taxes corporate profits at the corporate level and again when distributed to shareholders, a shift in the composition of investment towards corporate equity in the United States will raise revenue even if the IRA deposits do not represent additional net saving. (The effect would be greater if some of the deposits do represent net saving.) Feldstein does not, however, consider potentially offsetting sales of corporate equity by those investing outside IRAs. Because IRAs do not change the relative taxation of corporate and other assets, it is unclear why in equilibrium the relative shares of corporate capital in the economy would increase. Moreover, the impact on corporate revenue may not be important in New Zealand, where corporate profits are not subject to double taxation and overseas investors are more likely than in the United States to offset the effects of any shifts in portfolio holdings by domestic savers.

Nonetheless, it is possible that the expansion of tax-favored accounts has changed aggregate asset holdings by U.S. savers and in particular has increased the demand for less risky assets and shares of established companies. One possible channel through which the saving programs affect portfolio choice is by increasing the share of wealth that individuals hold indirectly through institutional investors instead of directly. Gompers and Metrick (2001) show that large institutional investors held 51.6 percent of publicly traded stock in the United States in

³⁸ We review articles that discuss how saving incentives programs affect government revenue in the long and short run, compared to a base case without the incentive. This is different than the problem of how to project the stream of future government revenue, given an existing program. For an example of the latter, see Burnham, Williams, and Woodward (2004).

1996, up from 28.4 percent in 1980. Compared with individuals and other investors, large institutions invest more in stocks with high market capitalizations, high volume per outstanding shares, high price per share (the authors call these stocks “large, liquid stocks”) and low past returns. Gompers and Metrick report a 4.5 percent increase in the demand for stocks of large companies and a 29.1 percent reduction in the demand for small stocks over the same period. Assuming unit elasticity of demand for small and large stocks, they calculate that \$1 in small and large stocks at the beginning of the period would be valued at 70.9 cents and \$1.045 at the end of the period, respectively—a 47.4 percent increase in the relative price of large stocks. The period between 1980 and 1996 was coincident with the introduction of 401(k) accounts and a large expansion in IRA assets, but this does not necessarily establish that the two events were causally related. The authors do not relate their observations to the introduction of these saving programs and we note that people also hold mutual fund assets outside of IRAs and 401(k) plans.

Friedman (1996) also discusses the implications of changing asset demands on the equity market and does discuss possible effects of the growth in 401(k) assets. Friedman cites a finding (Goldstein and Lynton 1992) that approximately 75 percent of participants in the 401(k) plans hold no stocks. However, the aggregate share of stocks in all 401(k) assets was 22 percent because highly compensated participants with relatively high contributions invested more in stocks. In comparison, Friedman finds that more than half of the assets of all privately sponsored superannuation plans, including both defined benefit and defined contribution plans, were invested in equity. Friedman notes that if the conservative investment behavior of 401(k) participants persists, there will eventually be less equity capital in the stock market. He also notes that the growth of 401(k) plans likely increases the importance of institutional investors because 401(k) participants generally have limited a role in deciding which individual stocks to buy and delegate the decisions to their fund managers. Both the Friedman and Gompers and Metrick papers suggest that expansion of tax-favored saving plans promote the growth of more conservative investment portfolios, although the evidence for this is far from conclusive.³⁹

V.C. Changes in Effect on National Saving over Time

The effects of a saving program on national saving can differ in the long run from its effect in the short run. Initially, introducing tax-favored saving accounts is likely to reduce national saving if the tax benefit is not immediately offset by an increase in other taxes or a reduction in government saving. The reduction in national saving is even more extreme if only a small share of deposits amount to net new private saving.

³⁹ Another driver of a shift to more conservative portfolios in tax-favored accounts is the differences in tax rules applied to interest, dividends, and capital gains. Because of the preferential taxation of capital gains, the U.S. tax system favors investment in growth stocks relative to investment in bonds and dividend-paying equities of more mature companies. (In 2003, the tax rate on dividends was lowered to 15 percent, the same rate as capital gains, but capital gains still benefit because they are taxed only on realization, not accrual, and go untaxed if passed on at death). The existence of savings vehicles through which individuals can accumulate income tax-free reduces the relative advantage of the capital gains preference because within the savings vehicles equity and debt returns are taxed at the same (zero) rate. It thus provides an incentive for people to hold their more highly taxed assets within tax-favored accounts (where tax-preferred capital gains have no relative advantage) and their other assets outside of them. In New Zealand, in contrast, the returns on superannuation funds are taxed as they accrue, so there is no tax incentive for holding more conservative portfolios within the KiwiSaver accounts than outside of them.

Some analysts have estimated that the IRA program in the United States initially produced virtually no change in national saving. For example, Attanasio and DeLeire (2002) estimate that, between 1982 and 1986, the average contribution in the United States IRA program for new contributors was \$3,170. Based on a (statistically insignificant) point estimate of a \$275 consumption decrease among the new contributors, they calculate that nine percent ($\$275/\$3,170$) of the IRA contributions represented new national saving. In an alternative calculation, they estimate that \$1,957 of the \$3,170 contribution came from an asset reallocation to take advantage of the tax benefit and \$1,110 from a reduction in federal and state tax liabilities, leaving only \$103 (three percent) of the contribution representing new national saving in the first year. By the way that countries typically keep their national accounts, the estimated transaction would show as an increase of \$1,110 in after-tax income (from the tax reduction), an increase in \$1,213 in private saving (the rise in after-tax income plus the fall in consumption), and a decrease of \$1,110 in government saving.

An alternative way of viewing this transaction is to consider the \$1,110 in tax saving as a loan from the government to the individual because the present value of the tax saving would be repaid when the taxpayer withdraws the proceeds of the IRA (the deposit plus interest in retirement). The real tax preference is that interest income in the account can accrue tax-free. Thus, to simplify, the individual has transferred \$1,957 from a taxable to a tax-free account and added an extra \$103 to the tax-free account from foregone consumption. At a 10 percent interest rate, in the second year, she is earning \$206 in tax-free interest (10 percent of \$2,060) in place of \$195.70 in taxable interest. At a 30 percent tax rate, her after-tax income has risen by \$69.01 ($\$206.00 - (0.70 \times \$195.70)$), while government revenue has fallen by \$58.71. She would have to save 85 percent ($58.71/69.01$) of her increase in after-tax income for national saving to increase.

Over time, the build-up in the stock of assets in tax-free accounts would increase the annual government revenue loss, but the build-up of private wealth in tax-free accounts would also increase private saving. Moreover, as individuals use up their stock of savings outside the tax-preferred assets, it is possible that over time a larger share of contributions to the accounts could represent foregone consumption instead of transferred assets.

Feldstein (1995) and Hubbard and Skinner (1996) suggest that the program may become self-financing in the long run with the tax revenues collected from the program withdrawals and the additional corporate income taxes from returns on increased corporate investment. The program withdrawals, however, do not add to net national saving (even though they result in more government revenue) because they themselves represent negative private saving. As noted earlier, however, even assets that produce tax-exempt income to individuals could generate government revenue if they represent increases in the stock of corporate equity, which generates corporate tax revenue.

As pointed out by Hubbard and Skinner (1996), the above calculation only focuses on a short-term impact of the program. In addition to the assumption about the increase in new personal saving which would not be saved in absence of the program, analyzing a long-term impact requires assumptions about the interest rates (i.e., comparative yields on the private savings accounts and government debt), tax rates on contributions and withdrawals, the length of time before contributions are withdrawn, the tax treatment on a (taxable) saving alternative, and how government finances the program (for example, increasing current taxes or increasing government borrowing, see below). Such a calculation requires, as in the simple one-year

example above, estimation of the change in the *stock* of accumulated personal savings instead of the flow of personal saving. Based on an assumption that 26 cents of every \$1 contribution represents new saving, Hubbard and Skinner (1996) estimate that after 22 years accumulated personal savings will increase by \$2.21 per dollar of lost government revenue. Because national savings is the sum of private and government saving, this estimate indicates that there is a \$1.21 increase in national savings per dollar of lost government revenue in the program.

Beyond this estimate, an increase in new national saving may result in an increase in corporate investment that in turn generates additional government revenue from corporate income taxes. When accounting for an estimated increase in corporate income taxes, Hubbard and Skinner (1996) find that the IRA program generates a \$3.84 increase in the national savings per dollar of foregone revenue, compared with \$1.21 when corporate income taxes are not considered. As pointed out by Feldstein (1995), the role of corporate tax revenues depends on the extent that the increased national saving is used to finance corporate investment. Further, as we noted above, these analyses do not fully analyze the rebalancing of portfolio holdings between savers with funds within and outside of tax-preferred accounts. Finally, the relevance of corporate tax revenue may be limited when the link between domestic saving and domestic investment is relatively weak, such as in the case of a small open economy when funds easily flow in and out of the country (Ruggeri and Fougere 1997). Thus, the corporate revenue effect that Feldstein (1995) and Hubbard and Skinner (1996) estimate may have little relevance for New Zealand.

Engen, Gale, and Scholz (1994) provide a different perspective. They show that when a saving program induces only a relatively small amount of net new saving, it may take a long time for the program to generate an increase in national savings. Analyzing the United States IRA program, they argue that individuals at the inception of the program were relatively flexible to reallocate existing savings to take advantage of the program's tax benefits. National saving declined in the initial period because the program generated very limited new personal saving, but incurred a substantial loss in tax revenue from the exemption of tax on contributions into and returns within the accounts. The decline in national saving would persist until net new saving starts to accumulate faster as individual contributors run out of the substitutable saving outside of their IRA accounts and younger individuals start contributing more. But in their analysis, it would take decades for IRAs to increase net saving because with the small IRA annual contribution limit it would take a long time for contributors to run down their substitutable assets. This would be true even when accounting for increased corporate income taxes simply because the increase in personal saving is relatively very small in the early periods in their analysis.

V.D. The Importance of How Government Finances Subsidies to Retirement Saving

As suggested in the above discussion, the impacts of a savings incentive program on national saving depend heavily on whether the government finances the program through government borrowing or a tax increase. To calculate the burden of an increase in government borrowing in the long run, researchers must assume the appropriate interest rate on the government borrowing. Alternatively, financing the program through a tax increase will likely generate a deadweight loss, which must also be taken into account as a cost of the program. Hubbard and Skinner (1996) provide analyses that take into account each scenario.

It is not obvious, however, how saving incentive programs are financed. Governments make a large number of spending and tax changes every year and it is even more difficult to determine how other government tax laws and spending would have changed in the absence of a saving incentive program than it is to determine the source of individuals' contributions to the accounts. Most analyses in the literature treat the saving incentive program in isolation and do not consider potentially offsetting changes in tax policy or expenditure policy, even though these changes could affect revenue feedbacks from changes in saving or corporate equity investment. But if a country operates under some type of official or informal budget constraint, it may be more reasonable to assume the revenue loss from the incentive is immediately offset by some countervailing fiscal policy. If for example, the incentive is paid for by higher tax rates, then government saving will not fall and the whole analysis would turn on whether the net increase in saving induced by the accounts is greater or less than any net reduction (if there is a reduction) in saving that higher marginal tax rates or other tax offsets may produce.

V.E. Some Implications for Evaluating the Effects of KiwiSaver

The studies offer four insights for understanding the effects of KiwiSaver on national saving. First, the analysis must take account of the program's effects on personal, business, and government saving—estimating the effect on personal saving alone is insufficient. Second, the effects on national saving depend critically on how much the program increases net private saving because, with tax incentives or other subsidies, there will almost certainly be a reduction in public saving, at least initially. Third, the net effects of the program on national saving are very sensitive to both the assumption about how the government finances the program and to many other assumed parameters, such as assumptions about rates of return on private assets and government bonds, portfolio substitutability among assets, and changes over time in the shares of net deposits that come from consumption and saving. Finally, the analysis must consider changes over time, with the probability that the incentives will increase net national saving rising the longer the time frame of the evaluation.

As the discussion above suggested, assessing the impacts of the KiwiSaver program on national saving requires at least an estimate of the extent that the program generates personal saving above what would be saved in the absence of the program and the costliness of each incentive provided by the program. The former is discussed at length in Section IV in this report. The latter includes the \$1,000 start-up incentive, the \$5,000 home-buying assistance incentive, exemptions from Specified Superannuation Contributions Withholding taxes on employer contributions, the investment fee subsidies, and other administrative costs. In addition, the analysis must define the scope of the impacts considered. In particular, it should be precise on which impacts are considered major and which are minor. For minor impacts that are not included in the analysis, the potential effects of their inclusion on the findings should be discussed. In addition, the analysis should clarify the set of assumptions employed regarding relevant parameters such as interest rates and tax rates. In particular, it should investigate the sensitivity of findings to assumptions about interest rates, budget offsets and the source of contributions to the accounts.

Compared with saving incentive programs in the United States, Canada, the United Kingdom, and other OECD countries, KiwiSaver relies relatively more on the default rule and

relatively less on financial incentives as a tool to induce people to save more and thus will probably result in a smaller revenue loss per dollar of contributions to the accounts. As a result, it is more likely that KiwiSaver will increase net national saving, for any given effect on net private saving, than would programs that rely more heavily on financial incentives to increase private saving. It remains to be seen, however, whether KiwiSaver will increase total participation in employer-sponsored plans as much programs in other countries that provide larger and more costly subsidies, even though the net effect of KiwiSaver on national saving is more likely to be positive than the net effect of the purely financial incentive programs in other countries.

Table 5.1 Studies on Impacts of Saving Incentive Programs on National Saving

Study Title	Author(s)	Program [Country]	Main Questions	Data [Country]	Methodology	Findings	Advantages and Limitations	Relevance
The Effect of Individual Retirement Accounts on Household Consumption and National Saving	Attanasio and DeLeire (2002)	IRA [USA]	Do IRAs increase private and national savings?	1982-1990 Consumer Expenditure Survey [USA]	Calculate the implied increase in national saving based on the estimates of differences in consumption drop and non-IRA financial assets between new and continuing IRA contributors	The IRA program generates a relatively small amount of national saving, ranging from three percent of the contributions based on the estimate of changes in non-IRA assets to nine percent based on the estimate of consumption changes.	Advantage: The study employs a simple approach to analyze the impacts of the program on national savings. Limitation: The calculation focuses only on a short-run impact. It does not take into account the stream of costs and benefits of the contributions in the program.	The study illustrates how to use different kinds of estimates of the impacts of the saving program on personal saving to calculate the impacts of the program on national saving.
Do Saving Incentives Work?	Engen, Gale and Scholz (1994)	IRA and 401(k) [USA]	How do IRAs and 401(k) programs impact household and national savings?	-	Simulations based on a stochastic life-cycle model	The IRA program induced a decrease in national saving in the few decades after the implementation of the program due to individuals' ability to reallocate existing assets to take advantage of the program tax-deferred incentive. National saving starts to rise when the ability to shift assets has been fully exploited and new savers join the economy. The program raises national saving in the long run, (defined as the length of time necessary for everyone in the economy to have access to the IRA program for her entire life, which takes approximately 70 years in their model) from 5.9 to at most 6.2 percent of the economy's output.	Advantage: The study presents a rigorous, complex analysis for evaluating the impacts of saving programs on household and national saving. In particular, the analysis takes into account uncertainties in earnings and longevity, and the extent that different generations of individuals interact in the economy. Disadvantage: The structure of the model imposes a strong restriction on how individuals may behave. For example, the model assumes that labor supply is predetermined. In addition, the model does not separately analyze the role of corporate tax revenues, which may be important, as suggested by Feldstein (1995).	The study offers a rigorous methodology for how to evaluate impacts of the KiwiSaver program. In addition, it emphasizes that the analysis must look at both the short and long term impacts of the program.

Note: Some of these studies may appear in another section of this report.

Table 5.1 (continued). Studies on Impacts of Saving Incentive Programs on National Savings

Study Title	Author(s)	Program [Country]	Main Questions and Outcome of Interest	Data [Country]	Methodology	Findings	Advantages and Limitations	Relevance
The Effects of Tax-Based Saving Incentives on Government Revenue and National Saving	Feldstein (1995)	IRA [USA]	How does the saving program affect national savings when corporate tax revenues are taken into account?	-	Calculates the implied increase in national saving based on a set of assumed parameters	Including corporate tax revenues resulting from the increase in personal saving and equity holdings due to the IRA program increases the likelihood that the program raises national saving. The program can be self-financing with a relatively low personal income tax rate, relatively high corporate tax rate, relatively large net personal saving generated by the program, and a relatively large fraction of new saving invested in corporate equity.	Advantage: The study employs a tractable analysis to assess the impacts of the IRA program on government revenue and national saving. Disadvantage: The study focuses on the scenario that the IRA program generates a relatively large amount of new personal saving. As a result, the findings cannot be generalized to the case in which new personal saving is limited. In addition, the analysis is very simplified and thus abstracts from many relevant details, such as uncertainties and induced portfolio reallocations.	The study emphasizes the relevance of indirect impacts of a saving program on national saving.
Assessing the Effectiveness of Saving Incentives	Hubbard and Skinner (1996)	401(k) [USA]	How much personal saving is generated from the IRA and 401(k) programs?	-	Calculates accumulated personal savings based on a set of assumed parameters	The impacts of the 401(k) program on national saving depend critically on the extent that it induces new personal saving that would not be saved in the absence of the program. When the program induces 10 cents or less of net personal saving per dollar of government revenue loss, national saving decreases. In contrast, the program increases net national saving if the induced personal saving per dollar of revenue loss is 19 cents or more. The program becomes self-financed when induced new saving is 40 cents per each dollar of government revenue loss and corporate tax revenue is taken into account.	Advantage: The study shows that findings can be sensitive to the underlying assumptions, especially on the degree that the saving program generates new personal saving that would not be saved in the absence of the program. In addition, it illustrates differences in short and long term impacts of the program. Disadvantage: The analysis is very simplified and thus abstracts from many relevant details, such as uncertainties.	The study indicates the need to assess the robustness of any finding from a chosen approach for the KiwiSaver evaluation. In particular, it requires that the analysis assess how the findings depend on alternative assumptions, such as the chosen tax rates or interest rates. Also, it emphasizes that the analysis must look at both the short and long term impacts of the program.

Note: Some of these studies may appear in another section of this report.

VI. Suggestions for Evaluating KiwiSaver

We conclude this review with some brief suggestions about the design of the KiwiSaver evaluation. We do not present a detailed blueprint, but instead discuss a few issues that should be considered.

Any evaluation of KiwiSaver must answer the following questions:

- What are the variables that should be studied?
- Why are these variables relevant?
- How should the variables be measured?
- How should the effects of the program on these variables be measured?
- Given the program's objectives, how can success be measured and how can analysis point to ways that the program can be improved?

We have not thoroughly surveyed available data sources or assessed the resources and time available to conduct surveys or gather data in other ways. Therefore, we discuss generally the types of data that would be desirable without assessing the practicality of collecting it. This further assessment would be necessary before developing a detailed plan for evaluation.

In general, we assume that the KiwiSaver evaluation will rely on non-experimental survey data, supplemented with data provided by Inland Revenue to examine the impacts of the program. We further assume that the combined data will allow the use of simple approaches to examine the impacts of KiwiSaver, ranging from a comparison between simple statistics (averages or medians of variables) to econometric techniques (ordinary least squares, quantile, or probit regressions). We address questions that might be asked in surveys, but do not address technical issues of survey design.⁴⁰

VI.A. Variables of Interest: Wealth and Saving

The two relevant variables that KiwiSaver might affect are wealth and saving. As stated in the KiwiSaver Act 2006, the purpose of KiwiSaver is “to encourage a long-term savings habit and asset accumulation by individuals who are not in a position to enjoy standards of living in retirement similar to those in pre-retirement” (KiwiSaver Act 2006, 11). Saving is an input that helps generate wealth, but the statement suggests that the principal goal is to encourage people to accrue enough wealth to maintain their living standards in retirement.

Saving and asset accumulation are closely related, but distinct outcomes. Current asset accumulation is determined by current and past savings and their returns. In particular, a change in asset accumulation in a time period (for example, one year) depends on the amount saved and

⁴⁰ It would be ideal to design a new survey for the purpose of the KiwiSaver evaluation but this may not be feasible, due to budget and time constraints. An alternative is to rely on existing surveys and field a supplemental survey with some questions regarding retrospective events to obtain the necessary pieces of information. Again, we only point out the pieces of information that we believe necessary for the evaluation and omit discussion of survey design.

the returns on accumulated assets realized in that year. For a given desired change in asset accumulation, the amount of new saving required is lower when rates of return on existing assets are higher. All things the same, higher saving raises wealth, but in any time period wealth and saving may move in opposite directions. For example, Bollard et al. (2006) note that asset appreciation has produced increased wealth among New Zealand households in the past five years in spite of negative personal saving rates, as measured in the national income accounts. Because the link between saving and asset accumulation is loose, the evaluation should examine the effects of KiwiSaver on saving and asset accumulation separately.⁴¹

VI.B. Relevance of Wealth and Saving Variables

As noted above, the recent decline in personal saving has generated significant concern in New Zealand. Yet, paradoxically, for a small open economy, foreign capital flows may have a larger effect on the wealth of residents than the residents' own saving. For example, suppose New Zealand residents hold most of their wealth in domestic assets, such as housing, land, and New Zealand owned and operated businesses. But at the same time, prices of assets in New Zealand are set in world markets and determined by international flows of mobile capital. In that case, asset prices in New Zealand will depend mostly on the attractiveness of investment in New Zealand to overseas investors. If local residents have portfolios that are concentrated in domestic investments, their wealth will rise with an increase in the international attractiveness of New Zealand assets and that rise in wealth will enable them to enjoy higher living standards both in the present and in retirement.

A further implication of the sensitivity of New Zealand wealth to international capital flows is that KiwiSaver may have little effect on household wealth even if it raises saving and reduces current consumption of New Zealand residents. Higher domestic saving and investment would depress marginal returns on New Zealand capital, causing foreign capital inflows to decline until relative returns are restored to make New Zealand investments attractive to marginal foreign investors. In short, increases in saving induced by KiwiSaver may raise the share of domestic assets owned by New Zealanders, but have only minor effects on the wealth of New Zealand individuals. This, however, could be viewed as a positive result if there is a concern that too much New Zealand capital is foreign-owned and would produce the result of higher domestic ownership, while maintaining free trade and open capital markets. For this purpose, it would be important to examine effects on domestic saving, apart from any change in wealth. To sum up, both variables are important, but for different reasons. A result that aggregate wealth in New Zealand did not increase would not mean that KiwiSaver is not working, if one also observed higher private saving rates of employees in New Zealand.

VI.C. Measuring Wealth and Saving

⁴¹ However, this does not imply that there is any conflict between encouraging a long-term saving habit and asset accumulation at the same time. The word "long-term" is key; an individual with a high tendency to save may reduce her saving in a period that asset returns are better than expected, but she should still save more than individuals with a lower tendency to save on average. Moreover, higher saving will ultimately lead to more wealth accumulation.

The first step in measuring the effects of KiwiSaver is to measure the wealth of residents in different accounts and the allocation of wealth among domestic and international assets. The key pieces of information on saving and asset accumulation are the amount being saved, how saving is distributed among different investment choices, and how assets of residents are allocated inside and outside of the KiwiSaver program. Additionally, it is crucial to obtain complete information on all assets, including the value of employer-provided defined benefit superannuation plans and New Zealand Superannuation benefits.

Measuring contributions to KiwiSaver accounts, wealth in the accounts, and the allocation of wealth among investment choices should be straightforward because Inland Revenue could collect these data in administering the program. Individuals' contributions, investment choices and asset balances must be recorded and thus should be available. It should also be straightforward to estimate the present value of national superannuation benefits for individuals, as those data depend only on benefit levels specified by the program and projected life expectancy.

Measuring private saving and wealth accumulation and the value of private superannuation is more challenging and requires survey data, some of which are already routinely collected. Without specifying exactly how additional data should be collected, we make a few observations.

First, transitory and seasonal events might influence the amount saved and investment choices at a given point in time. Thus, it is crucial that the same individuals be re-surveyed periodically, but not too frequently (perhaps a year apart), to minimize the effects of random noise and allow for the fact that some observations might be transitory. The timing of the survey should also differ for otherwise identical respondents to allow an assessment of how recent historical changes in prices influence respondents' portfolio choices.⁴²

Second, a major problem with any wealth survey is that individuals have imperfect knowledge on their asset portfolios and may supply inaccurate or inconsistent responses. This is particularly true for married households, where it is common that only one member of each household is responsible for the financial decisions. As a result, the survey should be designed to deal with possible missing data issues and identify the individuals who can provide the information relatively accurately. It is also necessary to design a series of consistency checks and to ask the same questions in different ways.⁴³

Third, it is sometimes better to obtain necessary information from a third party source instead of relying on the respondents' self-reported information. For example, it is commonly agreed that employees have very limited knowledge about their defined benefit superannuation plans and that it is better to collect information about plan benefits directly from the employers. If that is done, a way needs to be found to match employees to the employer plans that are surveyed and assign to them characteristics of the plans of which they are beneficiaries.⁴⁴

⁴² See Cronqvist and Thaler (2004).

⁴³ See the Health and Retirement Study (<http://hrsonline.isr.umich.edu/>) for a discussion of how to use unfolding questions to obtain additional information when respondents are not certain of the exact values.

⁴⁴ This approach was taken in the Health and Retirement Study, for example. However, it can be argued that individuals' behavior is determined by their perception of the value of benefits, not the actual value.

We have discussed approaches to measuring wealth at different points in time. Measuring the flow of saving is more challenging. Saving is typically measured by household surveys that ask questions about types of consumption and income sources and then calculate saving as the difference between consumption and income. But there are typically significant errors in the measurement of both consumption and income, which become magnified when measuring the difference between the two. An alternative approach is to design survey questions that measure income flows and deposits and withdrawals from accounts and use that information to back into a measure of net saving. Another alternative is simply to assume KiwiSaver has no effect on income and to use differences in consumption across individuals to infer the effects of KiwiSaver on saving (income minus consumption).

VI.D. Estimating How KiwiSaver Affects Wealth and Saving

In addition to providing necessary information on saving and asset accumulation before and after the implementation of KiwiSaver, it is critical to develop data needed to infer outcomes that would have happened in the absence of the program (the counterfactual outcomes).⁴⁵ As discussed in Section IV, this requires that the survey identify in advance the information necessary for the construction of the counterfactual outcomes, which likely involves categorizing the sample into control and experiment groups, with the caveat that the data are not from an actual experiment.⁴⁶

The first step in designing proper control and experiment groups is to identify clearly the target group in the analysis. In terms of the KiwiSaver program, a natural target group is individuals who participate in the program immediately. The question is how they would have behaved if they did not participate in KiwiSaver.

As discussed in Section IV of this report, the issue of unobserved heterogeneity is at the heart of a proper selection of the control and experiment (target) groups. Recall that almost all New Zealanders are eligible to participate in the KiwiSaver program and that ineligible individuals are quite different from the others. Individuals who immediately take advantage of the program may have different preferences for saving than other individuals with similar observable characteristics. Because the resulting problem of unobserved heterogeneity is difficult to address with cross-section data, it is unlikely that a simple comparison of participants and non-participants in one time period will yield a persuasive estimate of the effect of the KiwiSaver program on wealth accumulation or saving.

This leads us to the next question: Can we use longitudinal data to overcome the unobserved heterogeneity difficulty? Although the answer to this question is not a definite yes,

⁴⁵ For a detailed discussion of constructing data for estimating a counterfactual outcome, see Heckman, LaLonde, and Smith (1999).

⁴⁶ It is not clear whether conducting an actual experiment would be a better choice. An actual experiment is costly, which generally constrains the size of the experiment. As commonly discussed in the Experimental Economics literature, the small-scale nature of the experiment and its artificial nature can cast doubt about its applicability to the population as a whole. In any event, because KiwiSaver is being introduced nationally at one time, design of a controlled experiment in which different groups receive different treatments has effectively been ruled out.

relying on longitudinal data presents an opportunity to address the unobserved heterogeneity issue.

A clear advantage of relying on data from the same individuals over time is that it is plausible to assume that unobserved factors that influence their behavior are relatively similar across the period of study. However, as discussed in Section IV, it is not sufficient simply to compare saving or wealth before and after implementation of KiwiSaver. This comparison is insufficient because individuals' saving and wealth could be expected to change over time even in absence of the program in response to changes in the economy and personal situations, such as changes in earnings, job security, interest rates, and marital status. The challenge is to find a convincing method to estimate counterfactual behaviors.

One set of possibilities would impose assumptions on the expected changes in behavior in the absence of the program. For example, one could assume that the individuals will replicate historical patterns of consumption by age among individuals with similar incomes and demographic characteristics. This is certainly a strong assumption, so it will be necessary to assess how the findings change when alternative assumptions are imposed.

Another option is to survey respondents using a variety of qualitative and subjective questions to obtain information that guides the construction of counterfactual outcomes. For example, respondents may be asked before the implementation of the KiwiSaver program whether they plan to participate in the program and how they would behave if the program were to be cancelled. The same questions could be asked at a subsequent interview after the implementation of the program. The time interval between successive interviews would be selected to make the period short enough for the individuals to anticipate their future behavior relatively accurately, but long enough to allow them to change behavior. A comparison of the answers between the two interviews and the comparison between the actual and anticipated events could help in inferring the counterfactual behavior and thereby estimating the effect of the program.⁴⁷ Additional subjective and qualitative questions such as ones regarding individuals' saving preferences, risk tolerances, the role of employers and financial education, etc. should also be asked to allow a proper assessment of the consistency of the self-reported information and provide additional insight on how to improve the program. It should be emphasized that a goal here is to use self-report information to relax some assumptions that otherwise would need to be imposed and thus allow the findings to be less ambiguous. Of course, individuals may behave in ways that differ from what they tell survey-takers, so it is necessary that the survey allow for verification of the usefulness of these data.

To summarize, our suggestion is that the evaluation should obtain information that will allow a plausible construction of counterfactual behavior based on both collection of longitudinal data and survey questions on attitudes and choices. Panel data should be constructed because information from the same individuals across time is less likely to be subject to the unobserved

⁴⁷ See Manski (2004) for more detail on the use of expectation data. It should be noted here that the literature has an extensive discussion on how different answers may be observed when the same question is asked slightly differently, an issue commonly referred to as "framing". It should also be noted that self-reported information on the impacts of the program might not be easily compared across individuals, especially when respondents are asked to report the impacts on a qualitative scale, such as good, fair or poor. The reason is that a fair of one person may be comparable to a good of another individual. However, the scale is still useful because a good of an individual is clearly better than a fair or a poor of the *same* individual.

heterogeneity problem. Finally, the survey should contain questions to try to elicit the individuals' beliefs on which components of KiwiSaver had the most influence on their choices to participate, how much to contribute, and how to invest their contributions.

It is straightforward to estimate levels of participation in KiwiSaver and characteristics of participants. It is also straightforward to estimate the effects of KiwiSaver on saving and wealth, once a counterfactual has been selected. This can be done either through a simple statistical comparison between the averages of actual and counterfactual saving or wealth accumulation or through a type of regression such as probit regression to determine characteristics affecting program participation. But it is unlikely that the construction of the counterfactual will be without controversy and that net effects on saving and wealth can be measured easily.

VI.E. Success and How to Improve KiwiSaver

KiwiSaver is meant to encourage regular saving deposits, and increase net personal saving, wealth, and national saving. KiwiSaver may be considered a partial success if it induces many New Zealanders to participate in the program, but the real measure of success is its effect on retirement security, private saving and wealth accumulation, and national saving. These outcomes are progressively harder to measure, with the effect on national saving the hardest of all.

Nonetheless, the more easily measurable outcomes are not without importance. It is fairly straightforward, for example, to estimate the distribution of benefits among income groups and other population sub-groups. Data can be collected on who participates, how much they contribute, and how they invest their contributions. The effects of participation on retirement security can be simulated using various assumptions of how KiwiSaver affects net saving. For example, even if KiwiSaver does not increase net saving, the initial government contribution, the housing subsidy, and the assumption by government of the cost of investment fees will raise initial saving deposits and yields on saving. The effects on retirement security of these government benefits can be simulated for different income groups. Additional simulations can be performed using alternative assumptions about effects on net saving, based on the research results described in the previous suggestion.

Another measure of success is the increase in retirement saving per dollar of government budgetary costs. This calculation requires the prior estimation of the effect of KiwiSaver on net saving, as discussed in section VI.4 above.

A third measure of success is the extent to which KiwiSaver engages the employer community and encourages them to contribute to the plans. Employer engagement is one way to induce New Zealanders to save more through the workplace, although employees can potentially offset employer contributions by saving less outside of the plan. Employer participation could also make regular participation in saving plans the standard for much of the population. KiwiSaver provides an additional subsidy to employer-sponsored plans, so it would be interesting to measure how much the business community responds and how employer contributions encourage individual participation. A related issue is whether saving and wealth accumulation is larger among employees whose employers contributed to the plan than among those employees who contributed by voluntarily reducing their take home pay.

Finally, the ultimate measure of success will be whether KiwiSaver has increased national saving. The measure of additional saving per dollar of government revenue loss would provide a rough indicator of whether this objective was achieved with that caveat that the estimates would not account for secondary effects that may potentially be important, but would difficult to quantify with any precision.

VI.6. Concluding Remarks

In this section of the report, we offered some suggestions on the design of the KiwiSaver evaluation. Any evaluation will necessarily involve a number of decisions that may be controversial and subject to criticism. It is important that any evaluation method used be transparent and that sensitivity tests be conducted using reasonable alternative assumptions. The literature on saving incentive programs has not reached a consensus on whether or how much the incentives raise private and national saving and it is likely to be challenging to reach a research consensus on the effects of KiwiSaver as well. Still, investments in data collection and a solid evaluation using a careful study design can teach us much about the effects of KiwiSaver and help inform modification and improvement of the program in the future.

KiwiSaver is a unique program that is applying the results of new and exciting empirical research demonstrating how default rules can significantly increase participation in saving programs. While existing studies do not actually establish a link between higher participation and more net saving, their striking findings suggest that a positive saving effect may exist. An evaluation of KiwiSaver will be a first large-scale attempt to test whether a saving program that relies more on default rules than on financial incentives can be effective in increasing retirement saving. Because most OECD countries are struggling with how best to ensure financial security for an aging population without imposing excessive tax burdens on younger workers, the results of the KiwiSaver initiative should generate widespread international interest. A successful outcome will undoubtedly encourage other countries to reconsider their approaches for promoting retirement saving.

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