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determinants of saving behaviour

research report



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executive summary

Most people have some savings tucked away for a rainy day, but it seems not everyone has enough for their future needs. Indeed, some people have saved nothing at all. This perceived savings inadequacy is concerning to policymakers and has prompted research into ways of fixing the problem. This paper considers one question posed by that research: What things influence people's decisions to save?

The life-cycle theory

Most economic research on saving revolves around the "life-cycle model" of saving. In its simplest form, the model assumes that people decide how much to spend and save each year based on the income they expect to get over their entire lifetimes (that is, not just on their current income).

The model concludes that:

- people save (or borrow) so that no matter how much income fluctuates, they can maintain a steady level of spending over their lifetimes. This is their only reason for saving (or borrowing)
- temporary changes in people's income should not affect their spending decisions.

However, these conclusions are not borne out by what we see in "real life". For example, spending seems to be more closely related to people's current income than to their lifetime income – they spend more when they earn more. To adjust the model to better reflect "real life", economists have added more features to explain why people do or do not save. These include allowing for:

- people's desire to make "precautionary savings" to cover unexpected emergencies (such as large medical bills): this may actually account for the largest amount of people's saving
- some people's inability to obtain credit: about a third of New Zealanders behave as if they cannot borrow
- the desire to leave bequests at death: most people have assets left over when they die
- the role of tax and welfare systems: higher welfare payments reduce the incentive to save for emergencies, and higher taxes reduce the disposable income available for people to save.

Once we include these features, we have a model that is generally consistent with "real life" behaviour. However, it still has limitations. It is good at predicting "normal" or "average" behaviour, but it does not offer a satisfying explanation for everyone's behaviour. For example, the model says that an extravagant spender is someone who simply takes a very short-term view of life, but it does not tell us *why* they behave this way. For a better explanation we must look at psychological and sociological factors in saving.

Psychological and sociological factors

Using just the life-cycle model to explain saving behaviour essentially assumes that people get satisfaction only from "consuming" goods and services. However, real life behaviour is more complex – for example, people can also get satisfaction from the respect of their peers, and may take this into account when they are deciding how much to save.

This means we need to consider psychological and sociological factors in people's saving, such as:

- the effect their level of spending has on their social status; the higher the social status the higher the levels of satisfaction and respect. A “conspicuous consumer” is an example of someone saving less than we would expect (according to the life-cycle model) in order to increase their social status
- whether the level of saving is judged “appropriate” by family and friends. For example, before everyone became entitled to welfare benefits (such as government superannuation), there was social approbation for those willing to save. Even after benefits become available, it took a long time for society to change its estimate of an “appropriate” level of saving, so some people saved more than they really needed to in order to avoid disapproval.

“Irrational” saving

There is another problem with the life-cycle model: it assumes that people make sensible, or “rational”, decisions given their lifestyle preferences. However, in some special cases people's saving is out of kilter with their lifestyle preferences – for example, when compulsive spending leads to destitution. The psychological literature offers some reasons for this type of “irrational” saving behaviour:

- *Complexity*: some decisions are too complex for people to make in a completely rational way. The issues need to be simplified, but this often produces a less than desirable result. For example, people often keep their income and wealth in different “mental accounts” (such as separate borrowing and investment accounts). This helps them to simplify their decisions, but neglects the effect of one on the other. This may lead some high-income earners to assume they are well off even if they have no savings.
- *The influence of childhood learning*: skills learned or not learned in childhood can affect people's saving behaviour when they get older. Psychologists have found that it is hard to change behaviour that has been learned in childhood.
- *Self-control*: some researchers claim that certain people fundamentally lack self-control and so cannot use savings or credit facilities responsibly. Instead, they spend whatever funds are available.

Education is an effective way of helping people to reconcile their goals with their saving behaviour – in other words, it can make them more “rational”. Workplace seminars, public advertising and school-based education have all been shown to be effective.

Recent influences on saving behaviour in New Zealand

It would be nice to be able to combine all the different influences on saving and see whether the resulting model confirms the “real life” changes in saving we have seen over the last decade. However, this is difficult to do; disagreements over the meaning of data and the definition of “saving” mean we don't have a very reliable way to measure saving.

Nevertheless, if we had a reliable measure, we would expect it to show an increase in saving over the last decade or so – the result of:

- the rising proportion of New Zealanders in their prime-earning middle years of life
- the decreased importance of direct taxes in government revenue
- the decreased generosity of state welfare benefits
- rising household incomes and household wealth
- financial education campaigns.

One measure of saving – the change in household net worth - has risen over the last decade. This gives some support to the saving factors identified in this paper. However, other saving measures suggest saving has fallen.

Differences between particular population groups

To conclude this paper, we note that certain groups in society appear not to save as much as others. For example, women save less than men, and Maori and other ethnic groups save less than Europeans. Is this due solely to economic reasons, or do some groups have fundamentally different saving behaviour?

We find that the differences in saving are mainly the result of differences in income. For example, New Zealand savings data suggests very little difference between the savings of men and women who are on the same incomes. It seems that women save less than men only because they earn less. The case is similar for Maori.

However, these findings are debatable. For example, some researchers find that women save less than men because:

- they are psychologically and socially conditioned to leave the saving to men
- they are not as competitive as men
- they do not have good access to private pension schemes because they do not do paid work for as long
- they receive poor financial advice.

While evidence suggests these play a minor role, they are nevertheless worthy of further investigation.

the brief

In November 1999 the Office of the Retirement Commissioner commissioned Infometrics to review New Zealand and international literature on what encourages people to save or discourages them from saving (that is, to review the “determinants” of saving). The review covers economic, psychological and social theories of saving behaviour.

The Office was especially interested in whether the determinants of saving or non-saving have changed over the past decade, and whether different population groups show different responses to the factors that influence them to save. The Office intends to use the information as an aid to improving the effectiveness of its education programmes.

This paper has benefited from comments made on an earlier draft by Beatrix Riedweg, Dr Susan Gee, Professor Gary Hawke and John Savage. We take responsibility for any remaining errors or omissions.

introduction

It is often claimed that New Zealanders “do not save enough”. However, New Zealand is not the only country where people’s saving behaviour is criticised – the issue has become much more common in most Western countries over the past decade as the “baby-boomer” generation (people born in the post-World War II years) fast approaches retirement.

Lower birth rates in recent years mean the ratio of dependent retirees to working individuals in New Zealand is likely to rise from around 2010, stretching existing schemes that provide retirement income and health care for the elderly. This has raised concerns about how adequate savings are in New Zealand and provoked interest in what we can do to remedy any inadequacy.

There is considerable scope for debate here on the expediency of potential remedies and even on what would constitute an “adequate” savings level. However, we do not consider these issues explicitly in this paper. Instead we review one component of the debate: what makes people save and, conversely, what discourages people from saving.

Unfortunately there is no definitive answer to this question. However, the considerable amount of research on the subject in recent decades has greatly increased our understanding of the issues that make this seemingly simple subject highly complex.

Some important distinctions

This paper considers the determinants of saving behaviour at three levels:

- the individual
- the group
- the nation.

We believe the individual and group levels are most relevant to the Office’s goal of improving its educational programmes (as we presume these programmes are usually aimed at individuals, who have a limited ability to affect determinants of saving at the national level). Most of the psychological and social literature is concerned with the individual, as is a fair proportion of the economic literature.

However, some determinants of saving are better examined (or at least easier to examine) at a national level. This may simply be because there is more data available at this level, but it also permits a more sophisticated analysis of some aspects of saving theory. In particular, national level data allows us to model “feedback” from changing individual behaviour.

For example, when considering the effects of tax policy changes on saving, we need to consider the likely effect of any resulting changes in individual behaviour on the government’s budget balance - which in turn is likely to affect people’s saving decisions. In this way, the analysis moves from a partial framework (concentrating on the direct influences on behaviour) to a more holistic analysis of all the downstream effects (known in economics as a “general equilibrium analytical framework”).

As well as considering behaviour at the three different levels, we examined saving behaviour in “dynamic” (across time) and “static” (at a point in time) frameworks:

- The **dynamic** perspective came through in literature that considered patterns of saving over the entire lifetimes of individuals and households, taking into account “life-cycle” influences such as education, child rearing and the decline in income associated with retirement. These life-cycle influences help to explain observed patterns such as the tendency for women to save less than men (one explanation being that as women tend to spend longer out of paid work to bring up children, they also tend to have lower lifetime income).
- The **static** perspective came through in literature that removed the effect of life-cycle influences from the data and looked instead at the effect of non-life-cycle influences. For example, an Australian model of wealth accumulation shows that even for a given demographic status (e.g. age, income, marital status), women accumulate fewer assets than men. This (somewhat controversially) implies that non-economic factors cause men and women to behave differently.¹ These static models are therefore particularly useful in analysing the social and psychological determinants of saving.

Analysing behaviour at the three different levels and considering both dynamic and static settings allowed us to make a multi-dimensional analysis of saving behaviour, in particular:²

- patterns of saving over the lifetimes of individuals and households (life-cycle influences)
- the saving level of an individual household at a point in time (where life-cycle influences are considered constant)
- variations in saving patterns between different groups
- the combined level of total household saving over time.

In practice, these aspects often overlap, but separately they give an idea of possible applications of the theory and evidence covered in the rest of this paper.

What isn't covered?

Some aspects of saving behaviour are not considered in this paper. We do not, for instance, consider the determinants of saving “quality”. That is, we do not consider what makes people accumulate (or run down) particular assets and not others, or whether the mix of assets they choose to accumulate offers the best possible return. Our concern is whether or not people save, not the instruments they use to save.

However, as we noted in a report on retirement savings policy prepared for the Investment Savings and Insurance Association (ISI, 1998), the level of wealth at retirement is determined by the performance of existing investments as well as by ongoing saving. For this reason, it is important to consider whether a policy to boost saving has any perverse effects on investment performance. Interested readers are referred to ISI (1998), Arthur Andersen Corporate Finance (1999) or Infometrics (1999) for analysis of the effects of economic and tax policies on saving quality.

¹ *Cooke, King and Peacock (1999).*

² *We are grateful to John Savage for suggesting the distinction between these issues.*

the basic life-cycle model of saving

Most modern economic theory assumes that individuals are “rational” and “optimising”:

- Rational individuals make “good” predictions about the future and logical decisions.³
- Optimising individuals want to achieve the “best possible” result, given their perceptions of what is desirable and limitations on their ability to achieve a better result.⁴

The “basic life-cycle model of saving” brings together rationality and optimising behaviour in a dynamic (evolving through time) framework, to predict how individuals will spend and save. The model is generally attributed to Modigliani and Brumberg (1954). Browning and Lusardi (1996) and Coleman (1998) also provide excellent surveys of the literature produced since.

Basic model

The basic life-cycle model⁵ assumes that people obtain enjoyment from consuming goods and services.⁶ It follows that people should spend as much as possible, as this gives maximum benefit. Indeed, if there were no need to worry about the future, people would be best to spend all of their income – there would be no sense in saving.

However, when a person makes choices about saving and spending in the basic life-cycle model, they do so with the aim of maximising not only current benefits but also future benefits. Their income may fluctuate substantially during their life, and it may be better to save when earning high income to ensure they are not destitute when earning low income. This is particularly so when we consider that the benefit from an *additional* quantity of goods and services tends to get smaller, the more it is consumed at one time. For example, a sack of potatoes is appreciated by a family with none, but not as much by a family with ten already in the cupboard. In more technical terms, the “marginal utility of consumption is diminishing”.

Conclusions of the model

The main conclusion of the basic life-cycle model is that it is “optimal” for “rational” people to smooth consumption over time.

3 *In practice, someone who makes “good” predictions and decisions is someone who does not persistently make mistakes or ignore useful information. A counter-example would be the over-spender who consistently neglects to keep aside enough money to pay their rent, thereby becoming homeless. In order to judge whether such mistakes are made, economists compare real-life decisions to the ones that would be made by someone using an appropriate economic model. In reality, almost nobody would actually use an economic model to make their decisions, but they may be observed to behave as if they did. Readers interested in pursuing this perennial controversy might find Friedman (1953) a useful starting point.*

4 *For example, a particular individual may wish to live the most comfortable life possible, subject to a limited weekly salary. The individual will choose a particular combination of possessions, leisure activities and so on, to achieve this aim.*

5 *See the Appendix for an algebraic presentation of the model.*

6 *In this most basic presentation of the life-cycle model, consumption spending is the only factor given consideration in people’s utility functions. The life-cycle model has been extended and elaborated on in the years since its original conception (Modigliani and Brumberg, 1954). One area of elaboration has been the consideration of other factors that influence people’s sense of wellbeing, in particular security about the future and consideration of the prospects of children.*

We expect to see their consumption:

- fall steadily and smoothly over time (if they are impatient)
- stay constant over time (if they are indifferent)
- rise steadily and smoothly over time (if they are patient).

They will achieve this consumption by saving or borrowing.

If we assume that income peaks in the middle of a person's lifetime, then "smoothing consumption" implies saving less (or even borrowing) while young, saving more when middle-aged to pay off any borrowing and build up some reserves, and running down accumulated assets in retirement.

Another (secondary but important) conclusion of the model is that unexpected and temporary fluctuations in income should result in little or no deviation from the "smooth consumption" path. This is because people are concerned with lifetime income and lifetime consumption, so will not be put off their current spending plans by a single period of unexpectedly high or low income.

A useful test of the model is that it concludes that increases or decreases in income, if temporary, should not affect saving.

The model for the individual is easily extended to the household, by adjusting each household's consumption to reflect its demographic characteristics at any one time (e.g. number of children). With this adjustment, changes in the number of people in the household over time should not affect consumption behaviour. See Browning and Lusardi (1996) for details.

Interest rate effects

Interest rates are a key component of the basic life-cycle model (see Appendix). However, the model does not provide a clear conclusion on the likely effects of an increase in interest rates on consumption behaviour. This is because the model shows there are two opposing effects at work - an "income effect" and a "substitution effect":

- *Income effect*: a higher interest rate increases income from an existing stock of wealth (such as investments). This encourages households to spend more.
- *Substitution effect*: a higher interest rate makes it more attractive to invest money and delay spending it until later. This encourages households to spend less.

This interaction means that econometricians (who apply mathematical and statistical techniques to economic problems) have found it difficult to estimate the combined interest rate effect:

"...the current consensus among economists is that there is no evidence that the amount individuals save is very responsive to changes in after-tax interest rates"
(Arthur Andersen Corporate Finance, for Super 2000 Taskforce).

Most of the reactions we observe when interest rates change represent changes in relative prices between different forms of debt – as perceptions of the riskiness of lending money to different institutions or over different time periods change. This means most interest rate changes are likely to have a greater effect on the composition of assets than on the overall quantity of savings (ISI 1998).

In a worldwide study of saving, Masson et al (1995) found a significant positive relationship between the real interest rate and private saving in industrialised countries. However, they note that the results are not very robust because of data problems and the effect of financial liberalisation.

Savage (1999) notes that most studies he surveyed also found a positive relationship, although it was often weak or insignificant. He also highlights the problem (in estimating the specific effect of interest rate changes) of financial liberalisation and the associated shift away from interest rate controls.

How valid is the basic life-cycle model?

The validity of the life-cycle model has usually been tested by looking at consumption, rather than saving.⁷ If the model is valid and if most income changes are temporary, we should not see a strong increase in consumption in the middle, high-income earning years of a person's life and/or excessively volatile consumption owing to temporary changes in income. However, we actually observe both volatile and "hump-shaped" consumption (i.e. consumption rises with increases in income and accumulated wealth). This "excess" sensitivity of consumption to income was originally highlighted by Flavin (1981).

The life-cycle model also implies that changes in consumption should not be predictable from changes in income, if most changes in income are expected and unexpected changes are only temporary.⁸ But Carroll and Summers (1989) found a close match between a person's consumption path and the income path of their job, even though income paths vary substantially across occupations. Similarly, the growth rates of national consumption and national income are almost identical in many countries, even though the path of national income is relatively certain.

However, hump-shaped or volatile consumption paths do not immediately invalidate the life-cycle model. When considering volatility, Flavin (1981) and Campbell and Deaton (1989) argue that if changes in income in one period do not reverse out in the next (that is, income is "serially correlated"), a change in income is permanent rather than temporary. We might then expect some volatility in consumption, since permanent changes in income affect lifetime income as well as current income.

As it has proven particularly difficult to disprove the theory that income is serially correlated (Hall, 1989, cites some evidence), current income should be a major determinant of saving. In particular, a higher income in one year should mean higher saving in that year; something we often observe in empirical studies.⁹

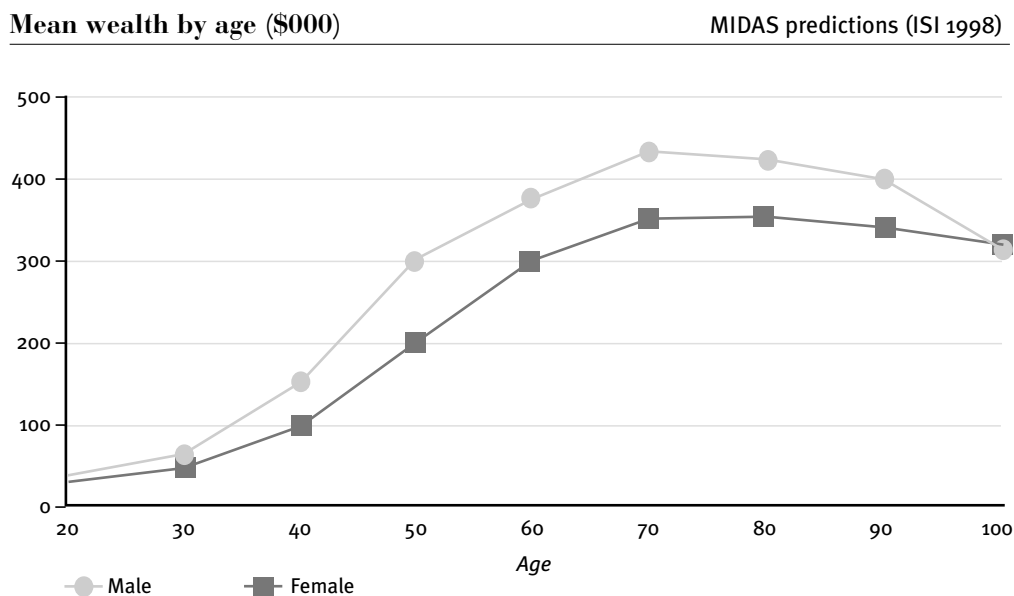
7 *This is an area of considerable controversy. The data used to test the validity of the life-cycle model is often scarce, incomplete or biased. In addition, simplifying assumptions are often required about the path of household income. Using saving rather than consumption as the variable of interest further complicates matters, because it is invariably not measured directly or neglects some aspects of the economic definition of saving. To avoid boring the reader, we have not laboured the point in our commentary, but we recommend treating the empirical results presented here cautiously. Browning and Lusardi (1996) provide a good overview of the technical difficulties in testing saving models.*

8 *If consumption changes could be predicted from income changes, the consumption track would probably be volatile rather than smooth.*

9 *See, for example, Dayal-Gulati and Thimann (1997) who find differences in per capita incomes are a significant factor behind differences in private saving rates in Southeast Asia and Latin America.*

As well as hump-shaped consumption, we observe that older people have persistently high asset levels. However, according to the basic life-cycle model, rational, optimising consumers should run down accumulated assets in retirement to zero, as they benefit from buying as many goods and services as possible.

However, they clearly do not run down their assets to zero. In New Zealand, work by ISI (1998) indicates that if historical patterns persist, the average 20-year-old New Zealander will have more than \$300,000 in assets when they die. This might be because housing is included in this figure – and as a person occupies this asset, it cannot be easily cashed up.¹⁰ Owner-occupied housing is essentially a durable good as well as an investment, providing a flow of services over time (just as a car or a fridge does). Therefore, it may not be appropriate to compare housing directly to other assets.¹¹



Another problem with validating the life-cycle model's predictions about consumption and (by implication) saving behaviour is that it is based at the level of a representative individual, while most available data is based at the aggregate level of the macro-economy.

It is possible (indeed likely) that even if each individual behaved according to the model, aggregate savings behaviour would not appear consistent with it. This is simply because aggregate savings depend on the population's age-income distribution. For example, Savage (1999) notes that the population's age distribution has significant effects on aggregate measures of saving. These effects are not only because of the pure composition effect (such as that there are more 80-year olds now than there were a century ago), but because of "cohort-specific" effects – for example, the saving behaviour now of an 80-year-old who has

¹⁰ It is possible to sell housing assets and use the proceeds for rent, but for reasons that will become apparent in the next subsection of the paper, this may violate imperatives for caution or leaving inheritances. Venti and Wise (1998) find that, in apparent contradiction to the life-cycle model, American elderly who do sell their houses are as likely to trade up as down.

¹¹ We are indebted to Professor Gary Hawke for pointing this out.

lived through the Great Depression may differ from the saving behaviour in 2040 of an 80-year-old influenced by the post-1973 high inflation period.

Overlapping generation models assess the effects of changing age profiles in the population. Attributed originally to Allais (1947) and Samuelson (1958), they are, however, rarely complex enough to cope with real world problems.

The problem of aggregation suggests that analysing the life-cycle model on a micro-economic basis is likely to be more useful than doing so on a macro-economic basis. However, even micro-data analysis has resulted in some contradictory findings. For example, Zeldes (1989) finds that the basic life-cycle model does not explain spending on food for a significant proportion of households. Meanwhile, Attanasio and Weber (1993, 1995) find that samples from the British Family Expenditure Survey and the US Consumer Expenditure Survey are consistent with the basic life-cycle model.

Enhancing the basic life-cycle model

Explanations for the tendency of consumption to vary over people's lives, in disagreement with the basic life-cycle model, have included:

- barriers people face when accessing credit, particularly when they are young and old
- uncertain life expectancy
- precautionary saving motives to cover unexpected emergencies in retirement
- the desire to leave an inheritance.

The last two are also helpful in explaining why household wealth stays high even in retirement.

Including features such as barriers to credit and uncertainty in the model may therefore give a theory that better fits what we observe. We look at additions to the basic life-cycle model in more detail below.

Uncertainty as an influence on saving

Uncertainty as an influence on saving has been a feature of literature for most of the last 100 years; John Maynard Keynes gave a number of reasons for saving (see Coleman 1998), with uncertainty playing the central role.¹²

Uncertainty is also important in the basic life-cycle model. The model effectively assumes that future income and interest rates are known, but of course we know this is a simplification. For example, in a short survey of international literature, Fethke (1989) cites one estimate that the proportion of total savings owing to the "precautionary" motive is 59%.

Uncertainty comes from more than unexpected movements in income and interest rates – we are not even sure about how long we will live, and this affects the amount we need to save for retirement just as much as income does. Nor are we certain that the smooth consumption path we have planned will be enough in

¹² *Uncertainty, argued Keynes, led individuals to defer consumption or investment and instead hold money. Holding money purely as a way of escaping risk, rather than for any other motive, was the form of saving that invalidated Say's law and allowed involuntary unemployment. Investigating the causes of involuntary unemployment was a central focus of Keynes's analysis.*

every period. For example, we may have to pay a large medical bill at a time when our savings are low (perhaps when young or in retirement). Uncertainty gives us a reason to hold some savings in reserve: these are “precautionary” savings. Hubbard et al (1994) has a partial survey of the literature.

We include uncertainty in models by assuming that people lose more benefit from a one-unit decrease in consumption than they gain from a one-unit increase. That is, people are “risk averse” – they would rather forego an increase in consumption now if it means they won’t experience a similar-sized decrease in consumption later. They will accomplish this by saving more (or borrowing less).

Coleman (1998) notes that precautionary motives for saving can have a large influence throughout life. For example, students may be unwilling to borrow (negative saving) for their education, as they are uncertain about the additional return they will get from being qualified over their lifetime. Retirees may hold some precautionary savings to pay for unexpected medical treatment.

In contrast, Browning and Lusardi (1996) use a survey of the empirical literature to deduce that:

“while the precautionary motive is important for some people at some times, it is unlikely to be so for most people... [it] has some role to play in explaining saving behaviour but is unlikely to be as important as some other studies suggest”.

In any case, precautionary behaviour does beg the question: isn’t this what insurance is for? It is, but insurance may be difficult to obtain or unfairly priced (in an actuarial sense) because of “adverse selection” and “moral hazard” (see Glossary for a definition of these terms).¹³ The commonly identified adverse selection problem in retirement insurance is that people who expect to die young will not want to buy annuities, while those who expect to live a long time will demand them. The desirable clients for insurance companies will be those who don’t want their products (Coleman 1998).

Bernheim (1991) notes that concern for potential emergencies might encourage retired households to hold wealth in the form of ordinary assets rather than annuities. We know that households do this even when close to the end of the life cycle (although this may be because of bequest as well as precautionary motives – see below).

Orr (1989) notes that uncertainty about inflation has historically caused New Zealand households to increase their savings (presumably to protect themselves from a deterioration in real incomes). It is also likely to influence the choice of savings vehicles, with inflation-adjusted assets such as land preferred ahead of nominally denominated assets such as annuities (ISI, 1998).

Savage (1999) notes that uncertain life expectancy, future income and interest rates create some precautionary saving: “In times of increased uncertainty savings will probably rise”.¹⁴

¹³ *Indeed Valdivia (1997) uses a life-cycle general equilibrium model to demonstrate that even in the presence of perfect information (ie. no hidden or expensive access information barriers between insurers and prospective clients), adverse selection can be severe enough to prevent the existence of widely available private retirement insurance.*

¹⁴ *This is the converse of the expected influence of uncertainty on investment. For example, Pindyck (1988) convincingly argued that the specific equipment required for investment projects makes them largely irreversible. There is therefore an advantage for firms to delay investment decisions during times of uncertainty. The combination of uncertainty raising the supply of savings and lowering the demand for its use is a natural mechanism under which economic downturns are halted, as the imbalance in supply and demand for funds will drive down interest rates until there is a sufficient reduction in the cost of capital to attract an increase in investment activity.*

Horioka and Watanabe (1997) say that precaution is an important motive for saving in Japan. Using a sample of 4,000 Japanese households, they found net saving for illness was the second most significant contributor to total net savings after retirement, accounting for 29.9% of total saving and 3.7% of disposable income. “Peace of mind” was the next most important motive, accounting for 26.1% of total net saving and 3.2% of disposable income. (Some net saving such as for housing was negative.)

They say that people have high precautionary saving (hypothesised rather than derived from the data) because of:

- capital and insurance market imperfections
- deficiencies in social insurance schemes (unemployment insurance, health insurance and welfare)
- a high incidence of natural disasters in Japan (this motive is perhaps not as important in New Zealand)
- risk-averse households.

Even when considering the “retirement” motive for saving, precaution is felt to be important. Reasons given for retirement saving include:

- the relatively low ratio of retired dependants to workers
- uncertainty about medical expenses and life expectancy for the aged.

The authors caution that their results are based on planned saving, so are open to bias.

Uncertainty about the sustainability of government policy can also influence saving behaviour. Edwards (1995) found that countries with greater political instability tend to have lower levels of public saving, presumably because they have shorter planning horizons. This in turn has a positive effect on private saving; Edwards found that, on average, for every 1% increase in government savings there is an associated 0.45% increase in overall savings (the effect of government saving on private saving is considered in more detail below).

Bequests

The basic life-cycle model implies that, on average, people will run down all their assets before they die. However, this is inconsistent with the common practice of individuals leaving and receiving inheritances.¹⁵

If such bequests were generally small, they could be attributed to uncertainty about life expectancy and medical expenses. In other words, they are “accidental bequests” – there is no plan to pass money on to descendants, but the need to keep some funds for (selfish) precautionary reasons means there are some assets left at death. This is entirely consistent with a life-cycle model with precautionary savings motives.

However, the size of bequests cannot be convincingly explained by precautionary motives. Overseas evidence indicates that a substantial part of wealth (30% to 60%) comes from inheritances (Stroombergen and Rose, 1998). This implies that people, on average, deliberately transfer some of their lifetime wealth to their descendants.

¹⁵ For a thorough review of the role of inheritances see Stroombergen and Rose (1998).

Fethke (1989) says most estimates of the proportion of savings from the bequest motive fall below 25%, which is less than half the estimated proportion of savings from the precautionary motive (59%). Nevertheless, the deliberate bequest motive is a necessary inclusion in any model of saving.

“Intentional bequests” can be made for “strategic” or “altruistic” reasons. Strategic bequests can be seen as the price for some service provided to the elderly person (i.e. in return for care or even just contact). The altruistic bequest motive has been found to be relatively weak, while strategic bequest motives are quite prevalent in some countries (Stroombergen and Rose, 1998).

The role of annuities and life insurance

If annuities are fairly priced and/or generate a rate of return at least equal to the rate of return on ordinary assets, it makes sense for retired people to purchase annuities and not hold other assets, as having an annuity removes any uncertainty about life expectancy.¹⁶ However, people cannot leave annuities to their descendants as a bequest.

It makes little sense for retired people to have term life insurance, but Bernheim (1991) finds that many US households do.¹⁷ Furthermore, the amount of life insurance tends to increase as public pension levels rise. This is consistent with retired people wishing to leave bequests; they cannot leave an annuity to their descendants, so they must hold other assets such as life insurance.

It is worth pointing out that most schemes are not actuarially fair¹⁸ (Savage 1999), probably because of adverse selection. That is, people who want to buy annuities are often those who expect to live longest and those who do not expect to live for very long will find it less than worthwhile. This raises the price of annuities for the average individual above the actuarially fair level.

Stroombergen and Rose (1998) note that if the proportion of total wealth attributable to inheritance is high and expected to stay high, it reduces the need for people to fund their retirement out of their own savings. They also note that the inter-generational costs of a “pay as you go” pension scheme (such as New Zealand’s superannuation scheme) can be mitigated if the older generation has a strong bequest motive.

Inability to borrow

The basic life-cycle model implies that individuals will borrow when they are young, as their higher income in their peak-earning years will enable them to pay off debt (and accumulate retirement savings). If they do not borrow when young, their consumption path is unlikely to be smooth - it will be hump-shaped.

Two reasons have been put forward for why people do not borrow when they are young:

1. Some people do not like to borrow when they are uncertain about future income (see “Uncertainty as an influence on saving” above).

¹⁶ *Buying an annuity entitles the buyer to an annual payout until death, regardless of the number of years in retirement. However, there is no payout at death if the returns to date are less than the purchase price. In contrast, ordinary assets provide annual income only until they are exhausted, which may be before death. However, if death occurs early there will be some assets left over.*

¹⁷ *Households may hold life insurance policies for precautionary purposes, since they may be cashed in to pay for unexpected medical or other expenses, but this is an inefficient way of insuring against such eventualities.*

¹⁸ *Actuarial fairness means correctly adjusting a payment to account for life expectancy.*

2. Some people are simply unable to obtain loans. Zeldes (1989) found that around one-third of households in a sample from the US Panel Study on Income Dynamics behaved as if they could not borrow.

In a study of a cross-section of countries, Callen and Thimann (1997) find that unemployment negatively affects saving, suggesting that the effect of lower incomes dominates any precautionary motive to save. This is consistent with the idea of credit or liquidity constraints.

Browning and Lusardi (1996) cite the results of a study that observed household responses to the removal of credit constraints. In considering the issue of spending on cars, the study found that “there is strong evidence that the abolition of credit controls led to a change in behaviour in the way predicted by a model with credit constraints”.

We can restrict the basic life-cycle model to allow for credit constraints by setting current wealth to always be greater than zero (that is, if the return on assets were less than or equal to the interest rate on loans, people would never borrow). Coleman (1998) demonstrates that credit constraints, in combination with precautionary saving and social security benefits, will lead those on low incomes to save less than they would in the basic life-cycle model. In particular he demonstrates that, depending on specific spending preferences and costs, each household will have an income level below which it will be unable to save anything. Above this amount, and as they are unable to borrow, households will collect a small amount of cash to smooth the worst unexpected income fluctuations.

Campbell and Mankiw (1989) adapted the basic life-cycle model to account for the presence of liquidity-constrained households by dividing society into two types of households:

1. “Liquidity-constrained” households that have no practical access to any credit, so cannot borrow to smooth consumption. Their spending patterns are closely related to their current income.
2. “Forward-looking” households that conform to the life-cycle model and therefore try to maximise their lifetime welfare by smoothing consumption over time through borrowing, savings and asset accumulation.

The Reserve Bank’s model for macro-economic forecasting¹⁹ assumes the proportion of liquidity-constrained households (λ in equation 3 in the Appendix) is 0.30, which is consistent with Zeldes’ US estimate (Black et al, 1997).

Target saving (consumer durables)

Savage (1999) notes that some goods provide a stream of benefits over a period of time, but payment is required “up front”. For example, a new car provides transport for a number of years, but we pay for all that transport in one lump sum when we buy the car, rather than paying for each ride we take in the car separately. People will save more (or perhaps borrow) to pay the up-front cost, which will cause some volatility in the consumption path and give a savings track inconsistent with the basic life-cycle model.

The influence of government

The life-cycle model does not have much to say about government, and some researchers (Arthur Andersen Corporate Finance, 1999) have written that tax rates, for instance, have very little effect on saving rates.

¹⁹ *The Forecasting and Policy System (FPS) core model, Black et al (1997).*

However, this is an area of some controversy. There is substantial international evidence that tax changes do affect savings, at least a little. And as a general rule, welfare spending (i.e. on packages such as public pensions) is accepted as an influence on saving. We begin with a model in which both tax changes and welfare spending are influential – the “dynasty model”.

In the basic life-cycle model, deliberate bequests are not allowed. However, in the dynasty model, parents optimise consumption not only for their generation but also for their descendants’ generation. This reduces the effectiveness of government fiscal policy initiatives and affects saving (which will rise or fall to offset any change in net government debt).

A rise in welfare spending (unaccompanied by a tax rate rise) might be expected to lift consumption as people’s income constraints are eased. However, in the dynasty model people realise that government debt will also rise, and because of their altruistic bequest motive are unwilling to pass on that debt to their descendants. They save just enough to exactly offset the increased spending and pass it on as a bequest so that their descendants will have enough to pay back government debt (through taxes) without unduly reducing their consumption. (See equation 4 in the Appendix.)²⁰

This type of saving behaviour is consistent with Ricardian Equivalence, but whether it exists in reality is highly controversial. For example, the theory can be invalidated through binding “non-negativity constraints” (the inability to give negative bequests) and giving bequests for other than altruistic reasons (such as strategic bequest motives).²¹

Nevertheless, significant government debt (or net assets) is likely to have some effect on saving behaviour. Higher government debt (where there are low taxes without offsetting cuts to welfare spending, or higher welfare spending without corresponding tax rises) would be expected to raise private saving. The cross-country evidence provided by Edwards (1995) – that a 1% increase in public saving is associated with a 0.45% increase in total saving – is consistent with the view that the forces behind Ricardian Equivalence apply, but not in the full one-for-one way the original theory implied.

Masson et al (1995) estimate that 60% of changes in the government’s fiscal position are offset by opposite changes in private saving. Callen and Thimann (1997) find even higher results in a cross-section sample of countries – in several cases full Ricardian Equivalence cannot be rejected – although this reduces to below 50% when panel data is used instead (i.e. the same countries are sampled again).

Horioka and Watanabe (1997) say that Japan’s high rate of retirement saving can be attributed to strong fears that the country’s pay-as-you-go pension system will be unable to cope with an ageing population. Using a sample of 4,000 Japanese households, net saving for retirement accounts for 62.5% of total net savings and 7.69% of disposable income. This is roughly consistent with Ricardian Equivalence - the young save more to offset the generosity of government pensions to their parents.²²

²⁰ *In this paper, we examine the partly offsetting effects of private and government saving. There may be similar effects between household and business saving, but they are not considered here for reasons of brevity.*

²¹ *Obstfeld and Rogoff illustrate how the concept of Ricardian Equivalence fails under strategic bequest motives. Their illustration is based on the paper by Bernheim, B. D., Shleifer, A. and Summers, L. H. (1985) “The Strategic Bequest Motive” *Journal of Political Economy*, 93 December, 1045-1076.*

²² *Or alternatively they do not fully trust future governments’ ability to deliver the same level of pensions when they reach retirement.*

Ricardian Equivalence can also be seen in governments granting tax incentives. These seem to have a clear positive effect on private saving, at least for a short time (Arthur Andersen Corporate Finance, 1999). However, national saving does not appear to rise, suggesting that tax incentives simply transfer existing savings from one sector to another (i.e. the government runs deficits because of its reduced tax revenue).²³

Empirical evidence on how effective tax incentives are in raising total saving is mixed. It is difficult to prove that increased saving in schemes such as the 401(k) plans (tax favoured retirement savings plans) in the US is new saving and not just saving redirected from existing investments.

In their cross-country analysis, Callen and Thimann (1997) find that a higher percentage of taxes coming from income taxes rather than GST have a negative effect on household savings. This may be because direct taxes fall proportionately more heavily on wealthy households, and wealthier households are seen to save more. Callen and Thimann's paper did not directly investigate the influence of the level of income taxes on saving behaviour, only the influence of the share of income taxes in total taxation.

Of course, the tax system can affect the destination of savings, even if not total savings. Most of the literature on the influence of taxation on the private sector tends to focus on the effect of taxes on economic growth. For example Gerson (1998) notes that tax policies that encourage or discourage saving work mainly by altering the real rate of return on assets. This means that, if tax policy is to have a meaningful effect on saving, it must be because saving is sensitive to the after-tax rate of return. Gerson concludes, however, that there is no consensus on the degree of that sensitivity, despite the many studies devoted to analysing it.

As well as setting taxes on the returns from private saving, governments are involved in providing retirement income (such as New Zealand Superannuation). Theoretically, actuarially fair public pension schemes should have no effect on consumption behaviour, as people will contribute exactly as much through pension taxes in their working lives as they would have saved for their retirement (Savage, 1999). And as private schemes do not appear to be actuarially fair owing to adverse selection problems, a public pension could actually allow people to have higher lifetime incomes.

However, empirical evidence on how government pension provision affects saving is mixed. Sturm (1983) finds a strong negative relationship between government provision and private saving across many countries, but notes that time series studies of individual countries often generate statistically insignificant results.

Bernheim (1991) finds that because the elderly wish to leave bequests, they must hold some non-annuity assets. The increased provision of government annuities therefore causes them to reduce the demand for private annuities and increase demand for other assets such as term life insurance.

²³ Professor Gary Hawke has raised the question of why full Ricardian Equivalence holds for specific tax incentives but not for general tax changes. This is not a simple question to answer, as the concurrent behaviour of government spending is also an influence on private saving. This behaviour can be explained by assuming:

- 1) the private sector assumes that governments will be more likely to run deficits as a result of specific tax incentives, so private saving will rise to exactly offset the future rise in general taxes needed to finance those deficits. They may believe this because, for example, governments that employ complicated tax systems are seen as more likely to run unsustainable deficits. National saving will not change
- 2) the private sector assumes that governments will generally alter spending following a general tax change to achieve a balanced budget, so private saving does not need to change. If the government then runs a deficit (surplus), national savings will fall (rise).

Households may not reduce their private annuity assets below zero and they may not sell government annuities. They must also pay for the government annuity (perhaps during their working life), which depletes the resources available for buying other bequeathable assets. In effect, households may be forced to pay for an annuity that is greater than they would have voluntarily chosen – they may have preferred to hold fewer annuities and more bequeathable assets. Bernheim estimates this is the case for more than a quarter of all households: they are unable to leave as much money as they wish to their descendants because of the compulsory provision of annuities by government.

Public pensions are not the only welfare benefits to affect saving behaviour. Other benefits (such as unemployment and sickness) as well as the provision of services in kind (education and health) can reduce public saving, for three reasons:

1. They reduce the ability of private individuals to save, because tax rates are higher to pay for welfare benefits.
2. Precautionary saving is no longer as necessary.
3. If benefits are asset-tested, families close to the asset-testing threshold may choose to reject precautionary saving, as this would remove their benefit entitlement.

In support of this argument, Callen and Thimann (1997) find that net government transfers to households (benefits less social security payments by households) are negatively related to household saving. However, they find no such relationship for gross transfers (i.e. social welfare benefits alone).

Hubbard et al (1995) construct a dynamic programming model with precautionary saving and asset-tested welfare benefits, using data from the US Panel Study on Income Dynamics. They find that raising the minimum government guaranteed level of consumption, from US\$1,000 to US\$7,000 per annum, increases the percentage of families with “low wealth” by 22.9% for low-lifetime-income households, but by only 4.4% for high-lifetime-income households.²⁴

Hubbard et al (1995) also show that, when income or asset tests are used, government-provided pensions discourage households with low expected lifetime incomes from saving. While providing a public pension removes retirement income uncertainty in these households, income/asset testing may reduce the household’s welfare – because it discourages them from accumulating private assets that might enhance their independence, provide a buffer against unexpected shocks or help the next generation through bequests.

The effect of inflation

During the 1970s when inflation was high and real interest rates were low, households increased their saving. Although there is some uncertainty about the exact effect of interest rates in the basic life-cycle model, lower real interest rates are not generally associated with higher saving. As most studies find that interest rates are either slightly positively related or not related at all to saving, a lower real interest rate should not encourage people at the margin to put off more spending now in order to enjoy the gains from investment later.

²⁴ “Low wealth” households are defined as households with net assets less than current income. Whether a household has low or high lifetime income is determined by the householder’s educational qualifications.

Clements (1984) writes that attempts to account for the divergence between theory and reality at a macro-economic level have typically meant adding the inflation rate to the model. This was justified by two arguments:

1. People do not like to see their real asset values eroded. As inflation reduces real asset values (unless the price of the asset is increasing faster), when inflation rises people cut back on current spending and save more.
2. Households perceive that high inflation means greater economic uncertainty and therefore increase their precautionary saving.

These arguments suggest that saving will be positively related to inflation rates, which is consistent with recent New Zealand experience of low savings rates in a time of low inflation.

However, Clements puts forward two (similar) arguments that the inflation rate could have a negative effect on saving:

1. Because it is related to uncertainty, inflation raises the required rate of return on assets. People become less willing to wait for future consumption because they do not know what the economic situation will be at that time. They therefore require higher real rates of interest or they will cut saving.
2. Because it is related to uncertainty, inflation creates doubt about whether savings will keep their real purchasing power in future. High rates of inflation for a fixed nominal interest rate undermine the actual rate of return on investments and may reduce future consumption opportunities. Saving less is a rational response to this threat.

Overall then, the theoretical effect of inflation on saving is indeterminate. Clements estimates that inflation had a negative effect on New Zealand's (national) saving in the 1970s.

Summary of the enhanced life-cycle model

The life-cycle model of consumption and saving does not provide a comprehensive explanation of consumption and saving behaviour, but has proven a sturdy foundation for virtually all subsequent economic analysis. The model is based on the premise that forward-looking people who wish to maximise their utility over time will do so if they try to smooth their lifetime consumption. The implications of the model are that:

- people are likely to save less when they are young and old and most in their high-income-earning middle years of life
- consumption should be smooth over time and not be sensitive to movements in income
- government policy has little influence on saving patterns.

Empirical evidence is at odds with these expected results. Household consumption appears to be far more sensitive to changes in income than the simple theory would suggest. It varies with transitory movements in income and people do consume more during the middle years of life than when they are young or old.

Analysis indicates that while the central premise of the life-cycle model is broadly correct, it needs to include some other aspects to improve its explanatory power. This includes making allowance for:

- uncertainty in terms of future income streams and life expectancy
- inter-generational wealth transfers, i.e. bequests and inheritances, which have been estimated to contribute up to 60% of wealth in overseas studies
- credit constraints, which make it difficult for large proportions of society to borrow (potentially as high as one-third)
- the influence of government, whose provision of benefits and pensions reduces incentives for private precautionary saving.

Government policy and actions are likely to indirectly influence saving behaviour, particularly through their impact on uncertainty. For example:

- inflation control will lower uncertainty about relative prices and the long-term security of financial assets
- market failure in private annuity markets owing to adverse selection problems may be redressed by public pension policies
- evidence of prudent fiscal management increases public confidence in future prospects.

Psychological and sociological determinants of saving

Kenneth Arrow, Nobel prize-winning economist, once remarked on the failure of the basic life-cycle model to explain features seen in micro-economic data:

“The key thing when it comes to the relationship between economics and sociology is the willingness to look at new data, like in savings. I think that once you do that, you are automatically going to be forced to consider social elements. Just ask different questions, and I think that you are going to be forced into considering and drawing upon sociology”.

Until now, we have considered only economic reasons for saving, such as income, medical expenses, the need for retirement income and so on. However, non-money factors also affect our sense of utility and therefore our consumption and saving behaviour. This may be particularly important for some cultures or socio-economic groups, such as women (see “Women” on page 33). People who allow these factors to affect their behaviour are not irrational - they use all available information and derive maximum benefit from behaving in this way. Some benefits are simply non-monetary.

Lunt and Livingstone (1991) quote previous research indicating that saving has important cultural meanings, so that understanding “socio-economic practices, moral judgements and the everyday understandings and attributions of the people involved” is essential in understanding how people calculate benefits from consumption or saving decisions.

Katona (1975) suggests that psychological factors lead people to react to macro-economic changes in predictable ways, but only if their economic “beliefs” are considered. Consumer sentiment, for example, seems to play a part in saving behaviour, as does “satisfaction”.

Lunt and Livingstone make the point that looking to social and psychological factors in analysing saving can do more than simply explain what we observe - it may also enable us to find ways of stimulating people to save. In the basic life-cycle model, the only policy variable is the interest rate, and its influence on saving is largely unknown.²⁵ If there is to be any hope of encouraging saving at the individual level, we must consider other influences.

Lunt and Livingstone’s 1991 study found that, compared with non-savers and after accounting for economic and demographic variables, savers tend to:

- feel better off than they did a year ago
- think they manage their finances better than their parents did
- feel better off than their parents did at a similar age
- expect to be better off in a year’s time

²⁵ ISI (1998) demonstrates that tax rates, inflation control, retirement income and benefit policies will also influence savings through an enhanced life-cycle model that explicitly incorporates public sector interactions with private sector consumption decisions. However, they note that there are also “deep” parameters such as risk preferences and discount rates (which reflect different planning horizons) which are recognised as influencing individual saving behaviour but remain unexplained by the life-cycle model.

- think the economy as a whole is doing well
- believe in personal control rather than fate
- think lack of self-discipline is an important cause of money problems
- do not endorse flexible financial management (i.e. they prefer to be locked in)
- talk to others about their financial situation and seek social support
- like to keep saving and consumption decisions simple.

Savers keep their decisions simple and lock themselves in where possible. As a result, they feel more in control of their finances. Non-savers, on the other hand, like flexibility but as a result do not feel in control of their saving behaviour. They do not seek social support when in financial difficulty and are likely to blame themselves after a bad decision, even though a fatalistic attitude (where they think they are a victim of fate) tends to see them make the “bad” decision in the first place.

The study’s methodology is somewhat questionable.²⁶ Nevertheless, it makes the point that people’s attitudes and ways of thinking are important in determining their saving behaviour. The level of savings (accumulated assets) is also explained in Lunt’s study by demographic and economic factors, although saving (single-period contributions to assets) was not well explained by demographic factors. This result is consistent with the above overseas evidence that bequests are an important component of wealth accumulation (Stroombergen and Rose, 1998).

Social status

The desire to achieve higher social status is one social factor that determines saving and consumption behaviour. Someone of high social status expects to be treated favourably by other people with whom they might interact socially or economically (Weiss and Fershtman, 1998). Because of this favourable treatment, the person will seek to increase their social status through group affiliation, investment in assets and an appropriate choice of actions. The influences on saving behaviour are not particularly clear, however. Saving may be reduced if consumption raises status, but increased if wealth raises status.

Duesenberry (1949) theorises that the desire to consume is boosted by the “demonstration effects” of consumption by others. Consumers base their consumption decisions on the norm for their reference group, saving more if their income is high relative to the reference group or less if their income is lower.

A relatively high level of consumption is presumed, at least psychologically, to generate higher social status or self-respect. The notion of “conspicuous consumption” is an obvious example. Weiss and Fershtman

²⁶ *The paper uses discriminant function analysis and stepwise regression, techniques which can be problematic unless used carefully. Few technical details are provided, but the success of discriminant analysis rests on the relative loss of incorrect classification of observations into the available groups (those with savings who save regularly, those with savings who do not save regularly and those with no savings) being reasonably symmetric. Also, stepwise regression, which was used both on its own and within the discriminant analysis procedure, is a hazardous way of inferring statistical significance, even when variables are grouped. This is because significance may depend on the order of entry of the variables, thereby being heavily influenced by the researcher’s prior beliefs.*

note that “signalling” such as that involved in conspicuous consumption does not necessarily imply excessive consumption and (economically) sub-optimal saving, although that is certainly what we would intuitively expect.²⁷ If social comparisons are delayed or made late in the life cycle, saving might actually be encouraged (presumably at lower ages).

However, they also make the point that people are observed to save even in old age, which seems at odds with the “delayed comparison” theory of conspicuous consumption. Weiss and Fershtman’s theory for such continued saving is that accumulated wealth itself is an indicator of social status.²⁸

Bresiger (1999) quotes evidence that some people are dissatisfied with the returns on their investments because their reference group is earning more. This can cause them to make unreasonably risky decisions about where to put their savings.

Social norms

When someone makes consumption and saving decisions, they weigh up the benefits of that consumption or saving over a long period of time. However, they may get benefits other than in goods and services, such as social status. They may also receive approval or disapproval from family and peers, and may feel pride or shame about choices, depending on what is “acceptable” behaviour in their society. These “social norms” are long lasting, so consumption and saving patterns may take generations to change.

Lindbeck (1997) claims (following the sociological and psychological literature) that social norms emerge as a result of spontaneous interaction between people in groups. Norm-senders, such as parents, may influence norm-receivers such as children, through their behaviour.

People will “rationally” imitate successful people. For example, before the advent of social security benefits there was a social norm in favour of work - not only did it prevent poverty for the individual, it also removed the need for family and friends to support them. Pressure to work was enforced by disapproval from others or even punishment.

The advent of welfare benefits reduced the economic incentive to work, particularly for people on low incomes. However, because social norms persist (or at least change only slowly) we find that even low-income people may choose to work more than is economically optimal, simply to avoid social censure or to increase their feelings of self-worth.

Lindbeck models the existence of social norms by including the behaviour of society as a whole in a person’s utility function. In this scenario the optimal choices of work, leisure, consumption and saving depend not only on the personal economic benefit obtained from each activity, but also on what others are choosing to do. For example, when choosing whether to work, an individual will suffer a loss of utility from public disapproval if they are unemployed, but that loss will diminish as the pool of unemployed people grows.

²⁷ Another interpretation of this result is simply that people of this disposition are more likely to conform with the predictions of the basic life-cycle model – as long as their future incomes eventually reach a level consistent with their early consumption patterns.

²⁸ We have already considered the bequest motive as a reason for continued saving - see section 1. The social norm and habit-forming theories discussed below are also consistent with this observed behaviour.

In terms of saving, economic incentives have been historically conducive to saving. Before social security, income taxes were low and people were expected to support themselves through times of temporarily high consumption spending or temporarily low income. Imitating people who were successful led to saving becoming the norm.

This norm was reinforced by parents who did not wish their children to be a burden on them in old age and, in some societies, wished to have their children provide for them in retirement. Schools and churches also reinforced the message that work and saving were virtuous, which institutionalised the norm. Even after the introduction of government welfare schemes, the prevalence of the social norm to work and save meant that household saving fell only gradually.

The theory of social norms is closely related to theories of habit formation and social learning (see below). The desire to consume conspicuously for social status (see above) conflicts with the social norm to save.

Determinants of saving when people are not rational

It can be difficult to account for the saving behaviour of some people. For example, we all know somebody who continually spends when they cannot afford to and then regrets it. To most of us, this behaviour is “irrational”.²⁹ This is an extreme example of irrationality, but an entire field of economics finds the assumption of rationality too extreme and seeks instead to look at “bounded rationality”. This has some serious implications for models of saving behaviour.

Richard Thaler is often credited with the theory of “bounded rationality” as it applies to savings, describing it as “the limited intellectual capacities of human beings” (Thaler, 1994). He argues that the optimisation problem people are supposed to solve when deciding how much to save is too difficult for all but the most extraordinary minds. In many situations involving complicated decision making, people can fall back on past experience or “rules of thumb” to behave as if they know how to solve a complex model, even though they do not.

However, Thaler argues that lifetime saving behaviour is different from most other economic problems each of us normally faces, in that we have only one go at it. This means that unlike other transactions, such as buying shirts, lifetime saving behaviour is not repeatable, so experience is no use and rules of thumb are not readily available.

He advocates financial education to help people evaluate their optimisation problem when saving. Bernheim and Garrett (1996), Bayer, Bernheim and Scholz (1996) and Bernheim, Garrett and Maki (1997) find that financial education, either in the workplace or in high schools, has a significant effect in encouraging people (particularly low-income individuals) to save. Their work is based on empirical analysis of United States’ data.

In New Zealand, the *Take Action* advertising campaign by the Office of the Retirement Commissioner had a positive effect on the percentage of the target audience making provision for their retirement (AC Nielsen, 1998). These empirical findings support the idea that people fail to appreciate their “economic vulnerabilities” and therefore do not save – not because of reasons identified by the enhanced life-cycle model, such as being liquidity-constrained or because of asset-tested welfare systems.

Such behaviour could still be consistent with the basic life-cycle model if the lack of adequate savings resulted from differences in planning horizons, and therefore some allowance for variable discount rates across people and time.³⁰ However, Shefrin and Thaler (1988) reject this as a major cause of “irrational” behaviour, arguing that the underlying reasons for such behaviour are much richer.

They construct a “behavioural life-cycle model” of saving in which a person is represented by two decision makers – a “myopic doer” and a “far-sighted planner”. Both the doer and the planner are rational, but the conflict between the two causes the person’s behaviour to look irrational. In particular, they seem to lack self control (see below). Shefrin and Thaler also allow for households to have several distinct “mental accounts” or classes of asset or spending decisions, each of which is treated differently (also see below). This further extends the range of behaviour consistent with their model.

²⁹ This should be distinguished from free-rider or fraudulent excess expenditure where the big spenders calculate (rightly or wrongly) that they will not bear the cost of their excessive behaviour.

³⁰ For instance, if my planning horizon is very short, I do not give much weight to future enjoyment of life and I will be unlikely to save now.

Other authors have argued for increased richness in specifying saving functions. For example, Lunt (1996) presents “focus group” material from the United Kingdom (i.e. an empirical analysis) to show that people consider a wider range of variables when making decisions than are normally included in standard saving models. In particular, people are not confined to thinking about changes in lifetime income: “We have to also model consumers’ expectations concerning demographic, social and political change, not just variations in the macro-economic climate”.

Webley (1995) points out that richer model specifications can have drawbacks. Specifically, quasi-rational or non-rational psychological approaches to analysing saving are, contrary to economic approaches, marked by “extreme eclecticism in both theory and method”. The nature of psychological analysis means that resulting models are hard to construct and to verify. Our impression after trawling the literature is that this is indeed the case.

Mental accounting

Under the life-cycle model, people wishing to save should be completely indifferent about the type of asset they hold as long as the return is no less than for any other asset. Any asset is the same for future consumption purposes.

Thaler (1994) argues from empirical observation that, on the contrary, people seem to consume out of different sources of wealth, regardless of returns. For example, households tend to consume more readily out of increased labour income than out of capital gains on housing investments. Consumers put their wealth into discrete mental accounts and spend money accordingly.

The life-cycle model can be improved, he writes, by relaxing the assumption of “fungibility” (substitutability of assets) and allowing households to have a set of “mental accounts”, with a varying tendency to consume from each.

Schweitzer (1999) presents evidence for mental accounting from a survey of US university staff. They were asked whether it was better to over-contribute or under-contribute (by the same amount – \$200) to Flexible Spending Accounts (FSAs).³¹ Since losses from under-contribution are after tax and losses from over-contribution are before tax, under-contribution should be rated worse.

However, 61% of respondents ranked over-contribution as worse, with 11% ranking both equally and only 28% picking the “correct” answer. Schweitzer asserts that respondents considered the FSA a separate mental account, separating it from other income. If they had considered other income, they would have realised that the over-contribution was pre-tax and would therefore not have the same effect on their after-tax wage and salary income.

Schweitzer also finds that the order of the choices was a significant influence on the response, with the last choice often picked as the most negative. This is consistent with earlier research he refers to, in which mental accounting is found to depend on history as well as other variables such as where events happened, with whom and how.³²

³¹ FSAs are pre-tax expense accounts for employees, from which health care expenses are later reimbursed. If employees contribute more than they are reimbursed, they forfeit the over-contribution. Likewise, employees must pay the difference from after-tax income in cases of under-contribution.

³² Henderson and Peterson (1992). No further reference available.

Bresiger (1999) quotes a US financial planner who often has difficulty convincing clients that a high-earning investment will leave them better off than paying off a relatively low-interest mortgage. Clients have separate mental accounts for borrowing and investment. The planner often encourages his clients to take out a home equity loan and let him invest it to prove that this sort of “mortgage aversion” is irrational in times of (for instance) high stock market returns.³³

Bresiger also finds evidence that US citizens confuse high incomes with wealth. He says it is common to come across individuals with huge annual income and no assets. One example is a surgeon who had made “megabucks” but had no accumulated savings once he retired. The implication is that he was keeping current income and accumulated income in different mental accounts.³⁴

Social learning/habit and rules of thumb

According to social learning theory, spending behaviour can be seen as learned behaviour often transmitted by parents and other influential individuals. It is, therefore, mainly passed from generation to generation (Carrier and Maurice, 1998).³⁵

Savage (1999) refers to the observed positive correlation between past and present saving patterns as another example of “habit persistence”. Changes in determinants of saving take effect only slowly, because people are slow to change their (learnt) behaviour.

In addition appropriate consumption (and by implication saving) behaviour is either learnt or not learnt in childhood, making it very difficult to change later. Bresiger (1999) notes that “financial dysfunction” can stem from psychological and family problems going back to childhood.

Carrier and Maurice draw on analysis of their (US) clients to consider extremes of inappropriate learnt consumption behaviour: compulsive spending and under-spending. They believe this results from mixed messages in childhood (e.g., “money can’t buy happiness”, “diamonds are a girl’s best friend”).

Compulsive spenders consume to compensate for a perceived inadequacy. They enjoy the act of buying and possessions give them “identity”. Under-consumers refuse to spend money, even to their detriment (such as refusing to spend on essential medical care). Living through hard times in the past appears to be an element in under-spending – it is often associated with people who experienced the Great Depression or wars.

Both compulsive spending and under-consumption have similarities to substance addiction. Some sufferers have been helped by learning to understand the importance of buying or hoarding (under-consuming) as an addictive ritual.

Carrier and Maurice conclude:

“Recovery from compulsive money habits is not unlike recovery from other substance abuse. This is not merely a ‘how to handle your money’ issue. It must be integrated along

³³ An alternative “rational” interpretation is that the individuals have a lower risk preference than the financial planner and/or they assess the risk differently from the planner.

³⁴ Or that the surgeon suffered from planning myopia and so operated with a very high discount rate. Thaler of course would reject the “discount rate” justification because it does not get to the root cause of the surgeon’s spending behaviour.

³⁵ There appears to be some similarity between the theory of social norms outlined above and the idea of social learning or habit forming. Elster (1989) argues that social norms are distinct from these others because habits are private and their violation does not generate self-blame or guilt. From our point of view, this is probably just a question of semantics.

with an improved sense of self-worth and self-esteem. People who have difficult money issues often carry a heavy burden of shame. Shame binds people to the problem.”

While these extreme cases are obviously the exception rather than the rule, the research does highlight the psychological aspects of spending and saving. In the context of the basic life-cycle model, the only way to incorporate these problems without violating its prediction is to assume that under-spenders have a very long time horizon, while over-spenders do not consider the future. However, while this may be satisfactory in producing a model that fits the data, it does not accurately represent the underlying behaviour.³⁶

Self-control

Thaler (1994) asserts that individuals would like to save but are unable to contain their desire to spend. Advocates of the basic life-cycle model of saving would claim these individuals simply have a low discount factor (β), so they prefer to consume now rather than later. Thaler argues (not particularly convincingly) that this is not the case; they fundamentally lack self-control. This is explained in his earlier paper with Shefrin (1988) as resulting from individuals having a sort of split personality, which causes them to act irrationally.

An implication of a lack of self-control is that people will prefer regular contribution schemes where they are “locked-in” to flexible schemes where they have easy access to money. Lunt and Livingstone (1991) corroborate this in a study of 219 residents of Oxford, England. They note that “savers do not endorse flexible financial management: maybe people only save by making themselves regularly put a certain amount away each month according to a fixed plan.” This idea that some saving arrangements are better than others is closely linked to the mental accounting theory (see above), where certain assets are not strictly substitutable for others.

Bresiger (1999) agrees with Thaler (1994) and attributes much “financial dysfunction” to a lack of self-discipline. This is based on research into mostly anecdotal evidence from the US financial services industry. A strict regime of saving and locking oneself out of consumption by, for instance, cutting up credit cards is seen as the solution for people lacking self-control.

Unstable preferences

Lunt and Livingstone (1991) claim (drawing on earlier theory) that consumption preferences are not stable over time unless psychological influences such as beliefs are considered. True preferences may not, they argue, be determined solely from economic variables.

In his later empirical paper, Lunt (1996) presents evidence that UK citizens’ attitudes to saving and consumption have changed over time, pointing to a perceived “change in the actual functional specification of saving”. People he analyses are clearly uncertain about the determinants of saving, perhaps as a result of these changes.

³⁶ *Even if it is just the mean behaviour in which the researcher is interested, ignoring information about what drives extreme outcomes can influence model accuracy. If the behaviour of individuals at the extremes is very different from that of most people, the estimates of mean behaviour may be a long way from what is in reality “typical”.*

For example, the place of consumption in utility is questioned by older generations, who argue that forgone consumption actually provided them with utility. (They argue that younger generations do not gain such utility because their higher incomes mean they no longer need to save for many items.) However, younger individuals do not question the place of consumption in the saving decision.

This evident confusion around the apparently changing nature of the consumption decision reinforces the “bounded rationality” literature, providing evidence that the saving decision is more complicated than just a single, easily-specified maximisation problem.

Summary of contribution from sociological analysis

Analysing consumption and saving behaviour from psychological and sociological perspectives offers useful enhancements to the basic life-cycle model, particularly through insights into people’s decision-making processes (i.e. what drives them to make a decision and reject competing alternatives).

This analysis does not necessarily refute the enhanced life-cycle model, but offers pointers to ways of further enhancing the life-cycle model. In particular it points to the importance of variability in decision-making processes (across individuals and time) of factors that are generally assumed constant in the basic life-cycle model. These factors include:

- different attitudes to risk
- the way people process available information
- expectation processes
- planning horizons
- the influence of non-material aspects of individuals’ utility functions.

The importance of these factors increases the more one is:

- interested in issues related to the distribution of saving behaviour or aspects of specific target groups
- focused on people’s decision-making processes (e.g. when the topic is how a policy will influence savings rather than what the aggregate impact will be)
- concerned that the impact of extreme saving behaviour has significant effects on estimates of combined or average saving results.

The changing importance of different factors over time

Throughout this paper, we have assumed that people follow some sort of decision-making “model” when making saving choices.

If we notice that savings behaviour changes over time, the change could be coming from one of two sources:³⁷

1. A “**changing magnitudes**” influence: The person could be using the same decision-making model they always have, but one of the inputs into the model has changed. For instance, suppose people use direct tax rates in their “model” for deciding savings and that (as suggested by Callen and Thimann, 1997) tax rates are inversely related to saving in that model. This means that since direct tax rates have come down in New Zealand, the household saving rate will have increased.
2. A “**changing parameters**” influence: The person might actually be using a different model from the one they once used (or different from that which analysts think influences them). For example, Lunt (1996) argues that when making saving decisions individuals now need to consider risks that were previously hidden. These risks appear as decision variables in the individual’s “model”, although they were not there before. The possibility of such parameter instability is well known, although the specifications of the basic life-cycle model attempt to avoid parameters as much as possible.

In this section, we will outline the observed shifts in saving behaviour over the last decade and comment on the changing magnitudes and changing parameters that may have contributed to those shifts. Please note that the vast number of influences on saving and complications with the official saving measures mean these comments are speculative.³⁸

Household savings in the 1990s

Savage (1999) provides a thorough summary of the inherent difficulties in measuring savings. He explains that savings can be measured from either a “flows” or a “balance sheet” approach:

- The **flows** approach is based on income and outlay accounts and defines saving in any specific time period as the difference between disposable income and consumption.
- The **balance sheet** approach relies on measuring the accumulated stock of saving (i.e. a person’s net worth) then defines saving as the change in net worth between time periods.

³⁷ In technical terms:

A standard linear regression model has the following structure: $y = ax_1 + bx_2 + \dots + zx_n + \mu$

Where: y is the dependent variable (in this case, probably saving), the “ x ” terms represent independent variables (such as lifetime income, direct tax rates and so on). The letters a , b and so on are fixed parameters that characterise the relative relationship between the individual variables and the dependent variable. μ is a white noise disturbance term that accounts for any remaining unsystematic innovations in y .

Changes in the “ x ” terms are expected and will be picked up by the model. The underlying behaviour of the agent is unchanged when the “ x ” terms change – they are just responding normally to different magnitudes of their existing decision variables. Changes in the parameters a , b ..., however, are unexpected. They indicate that an agent has a new decision-making process, where they give a different importance to a decision variable, or even introduce a new one.

³⁸ Some readers may be interested in a similar examination of US household saving behaviour. See Browning and Lusardi (1996).

Both approaches have measurement problems:

- *Residual issues*: both approaches calculate saving as the residual between two large values. This means the measurement of savings is very sensitive to the accuracy of these measurements, and like all residuals is subject to compounding errors (i.e. small measurement errors can have a very large impact downstream).
- *Boundary issues*: e.g. what is the boundary between households and other sectors?; which assets should be included in measures of net worth?
- Asset valuation and the effect of capital gains – particularly in terms of the balance sheet approach.

The result is that despite the recognised importance of saving, we cannot rely on the accuracy of even official national savings measures.

Official statistics of household savings use a flows approach. The implied saving rate for New Zealand households in the 1990s is presented in the graph below. Given the large potential for measurement error, we can put little faith in the actual numbers in the graph (or even their implied sign³⁹). However, these saving estimates do indicate a fall in household saving in the 1990s. On the face of it this is problematic since, on balance, the factors we have identified as determinants of saving should probably have raised saving over the last decade, even if only a little.⁴⁰

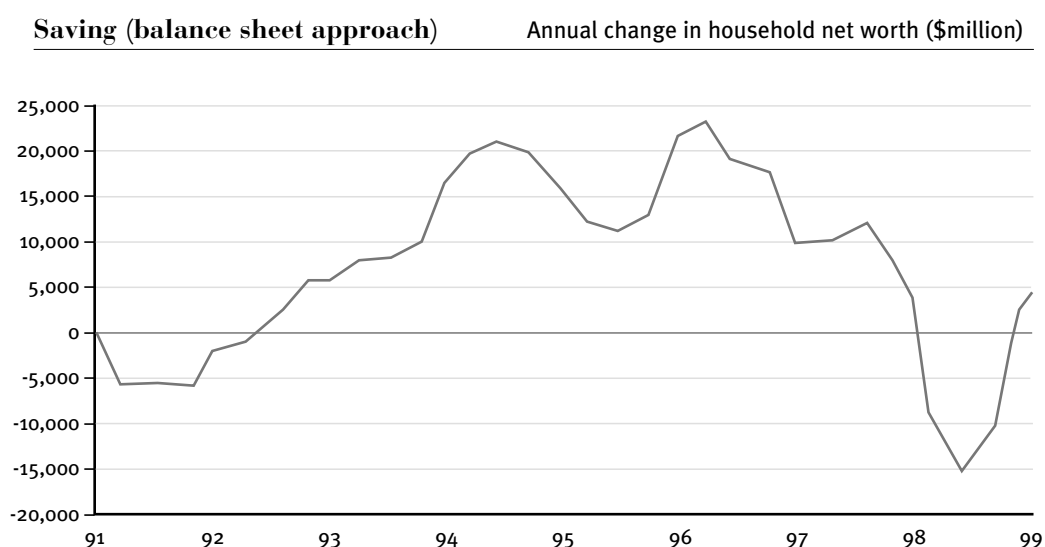


Source: Statistics New Zealand

³⁹ For example, if household incomes are consistently underestimated but consumption figures are broadly correct, actual savings rates would be consistently higher than presented in the graph.

⁴⁰ This will become apparent in the conclusion to this section.

A balance sheet approach, however, indicates that it may be misleading to conclude that household saving is falling. For example, an allowance for increases in house values implies a different pattern of saving behaviour and indicates that household net worth has actually increased substantially over the 1990s (Savage, 1999).



Source: WestpacTrust Household Savings Indicators as compiled by Morningstar and NZIER

If we assume that an increase in house prices (a pure valuation effect) increases wealth and therefore lifetime income in the basic life-cycle model, we can expect an increase in consumption from current income and a decrease in the proportion of current income saved. The decline in the official flows-based measure of savings (which excludes valuation effects) is therefore consistent with the basic life-cycle model.

Having formed a rough picture of overall saving behaviour over the last decade, we now turn to the individual determinants of saving. In a perfect world, we would aim to add up the (theoretical) effects of each of the observed determinants over the 1990s to see whether they produce the same result we observe in overall behaviour. However, this is not a perfect world and we stress that in the following analysis, the potential for errors in measuring savings makes it impossible to assert how changing circumstances have influenced overall saving behaviour.

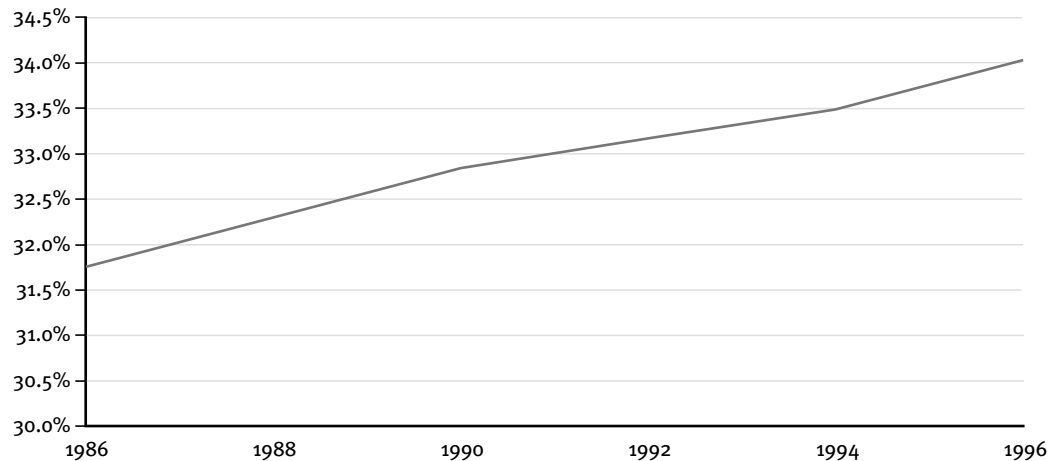
Changing magnitudes

Demographic trends

Since the 1980s there has been a steady increase in the proportion of New Zealanders who are in their middle, high-income-earning years of life. According to the basic life-cycle model this trend should be associated with an increase in savings.

Middle age spread

% of New Zealanders aged 35-64



Source: U.S. Bureau of the Census, International Data Base

Welfare and tax reform

Since the mid-1980s, New Zealand has undertaken substantial tax and welfare reform. Top marginal direct tax rates have been lowered, an indirect tax on consumption (GST) has been introduced and welfare benefits (including superannuation) have been reduced and more strictly targeted.

We would expect all these factors to result in an increase in saving behaviour, as:

- according to the analysis of Callen and Thimann (1997) above, declines in direct taxes are likely to result in an increase in saving (presumably as the after-tax income gain is greatest for high-income households that tend to save more)
- GST represented an increase in tax on consumption and so might be expected to encourage saving, at least marginally
- the reduction in benefit generosity is likely to increase precautionary saving incentives.

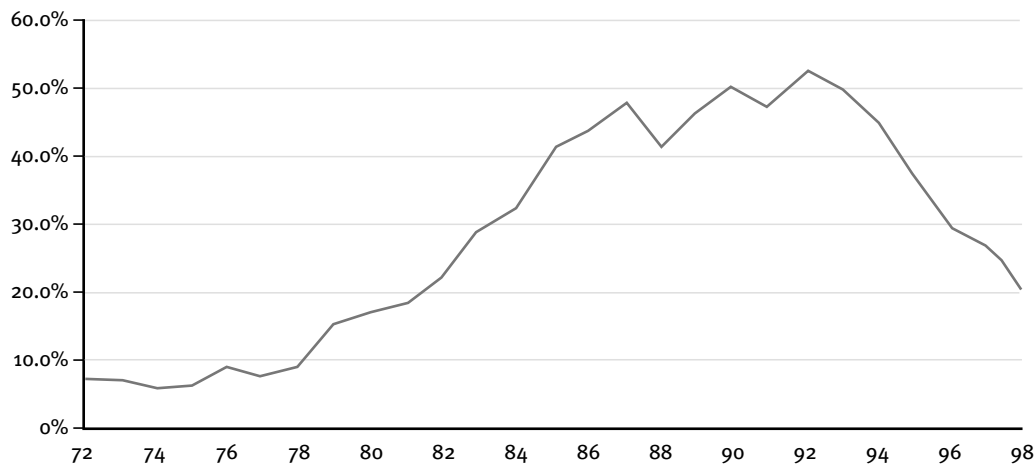
Savage (1999) notes that publicly funded health, education, welfare and pensions have probably affected incentives to save: "In recent years, changes in eligibility for benefits and the funding of some social services may have altered saving behaviour".

Government saving

The compensating improvement in the government's fiscal position since 1990 potentially offsets this upward pressure on savings. Ricardian Equivalence impacts, even if they are only partial as suggested by Edwards (1995), still imply that the increase in government saving (as seen in the fall in net public debt) has resulted in at least some reduction in private savings.

Net public debt

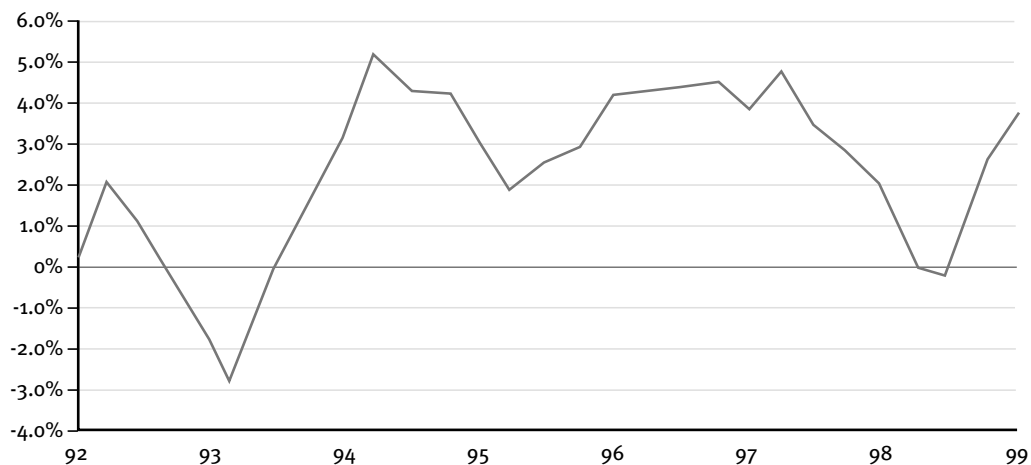
% of GDP

*Source: Treasury***Wealth**

There has been reasonably strong growth in New Zealand household wealth in the 1990s, seen in the growth in real disposable incomes and real price increases in housing, New Zealanders' preferred saving vehicle.

Real disposable income

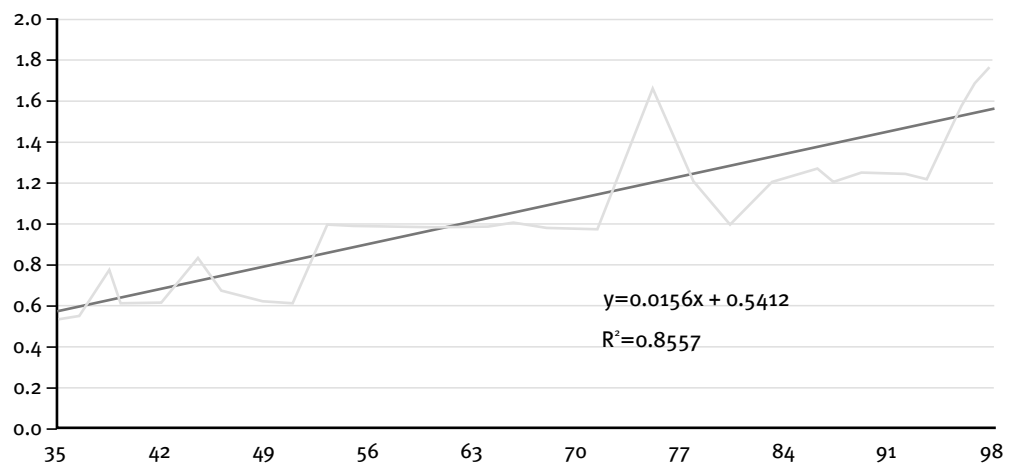
Annual average % growth

*Source: Statistics New Zealand*

Real disposable incomes have increased on average by 2.3% per year since 1992, as a result of (by New Zealand standards) sustained economic growth and significant tax cuts in 1996 and 1998. In the decade to March 1999, real house prices increased by 27%, well above the typical 20th century decade increase of 17%.

Real price of existing dwellings

March 1961 year=1.0



Source: Infometrics

The enhanced life-cycle model suggests two potentially offsetting effects of this wealth gain on saving behaviour:

- If there is no change in people's tendency to save, an increase in wealth will lead to a higher level of savings.
- However, the wealth increase may also lower incentives to save, as target levels of saving may now be reached with lower rates of saving.

The cross-country analysis of Callen and Thimann (1997) suggests the positive effect tends to dominate. Their analysis did not directly investigate asset valuation effects.

Changing parameters

Financial market deregulation

Financial market deregulation has changed the optimisation problem for consumers. However, the effect on saving is (as usual) uncertain because there are actually two offsetting effects at work:

1. A wider range of more efficient financial instruments boosts the returns on saving and therefore should increase the tendency to save (Masson, 1995).
2. Relaxing credit constraints reduces saving.

Savage (1999) notes the 1980s' financial market liberalisation widened the range of financial instruments available to New Zealand households and reduced credit constraints. "For this reason, there is some international evidence that liberalisation has been associated with lower household saving rates."

For example, Callen and Thimann (1997) use consumer credit and the number of credit cards issued to represent financial deregulation in a sample of 21 countries. They find that financial deregulation is associated with lower saving rates, implying that easing credit constraints outweighs a better range of savings instruments. However, they report the results were particularly sensitive to equation specification⁴¹ and sampling period.

Lunt (1996) notes that financial market deregulation has increased both the complexity of financial decision-making for the individual and the uncertainty involved. The fact that consumers are now more exposed to market instability may be a third influence of deregulation on saving (in addition to easier credit and a better and wider range of assets). Lunt does not make it clear whether this is likely to increase or reduce saving, although we assume it would increase precautionary saving, particularly in low-risk (therefore mostly low-return) assets.

However, there is a counter-argument that improvements in financial market efficiency will raise the returns from saving. But the net impact on saving depends on whether the saving incentive from greater rates of return dominates the consumption incentive from higher levels of wealth.

Financial education

The publication of the 1992 report by the Task Force on Private Provision for Retirement has resulted in a heightened public awareness of:

- the potential inadequacy of current saving, at least for retirement income
- the potential risk that publicly funded pension schemes may not be as generous in the future as they are today.

The Office of the Retirement Commissioner has undertaken extensive public education campaigns, mostly through television advertising and brochure publications, but also to a limited extent (so far) in schools. Our analysis suggests that increased education will encourage those who are not saving to make greater provision for their futures (particularly those who are on low incomes).

Even if we dismiss bounded rationality arguments, this is likely to be appropriate as rational behaviour is always bounded by the available information. Thus any action that improves a person's information about future prospects is likely to influence their behaviour.

If education is effective in raising saving levels, we have yet to see clear, unambiguous evidence of this in New Zealand. Indeed, household saving rates have fallen steadily over the last decade.⁴² However, Bernheim, Garrett and Maki (1997) note that the effects of some educational initiatives in the US have been slow to emerge because of implementation lags. This is also a possibility in New Zealand.

⁴¹ *The variables included in an economic model and the assumed form of the relationship between them.*

⁴² *This may be partly because spending on residential construction is up. This often equates to a form of saving, since New Zealanders hold much of their wealth in the form of housing. Housing as a form of saving is not measured in the national accounts – see Savage (1999).*

Shifting the burden of risk

Lunt (1996) claims that financial market deregulation has shifted the burden of risk (investment, health etc) from government to individuals. “Risks that were managed institutionally and ‘hidden’ from the consumer have been devolved to the individual, household and cohort. Opening up opportunities for the individual in the economy involves exposure to risks that were once managed collectively or institutionally.” This increases the saving decision’s complexity and boosts uncertainty. One might expect this to lead to more saving, but Lunt is unclear on this.

Summary of recent developments

Despite reservations about our ability to accurately measure the level of household savings, the rate of saving from the current income of New Zealand households appears to have fallen in the 1990s. The rate of saving from lifetime income (which includes existing wealth) may, however, have risen thanks to rising asset prices.

The factors influencing saving patterns in recent years have been numerous and had potentially conflicting effects, although on balance we might have expected them to raise rather than lower saving:

- We would have expected an increase in the proportion of New Zealanders in their prime-earning middle years of life to have increased saving rates over the past two decades.
- Changes in the tax mix (decreasing the importance of direct taxes) and reductions in the generosity of government benefits are likely to raise private saving incentives, but this will be offset to some degree by improvements in the government’s overall financial position.
- It is difficult to assess how improvements in wealth perceptions through robust income growth and capital gains on housing in the 1990s have affected household savings. However, international studies suggest the net impact is likely to have been positive.
- International evidence suggests that financial deregulation is likely to have reduced saving levels, as increased access to credit and wealth impacts on consumption dominate saving incentives from higher rates of return.
- Financial education programmes like those of the Office of the Retirement Commissioner are likely to have a positive effect on saving levels.

The differences between particular groups in the population

Women

Factors explained by current models

Firstly, we note the extensive literature on the experience and needs of women in retirement – particularly that, because women live longer than men, they rely on accumulated lifetime savings for longer and are more than twice as likely as men to live in poverty in old age (Arber and Ginn, 1999). A full discussion of this issue is beyond the scope of this paper, but interested readers are referred to Walby (1999).

ISI (1998) uses the “MIDAS” model to examine the distribution of New Zealand savings.⁴³ The model expresses savings as a function of age, sex, ethnicity, marital status and income.

The MIDAS model shows that the average woman’s savings are less than the average man’s at all ages. At retirement age, the average female aged 15 today will have saved only 75% as much as the average male of the same age. Clearly, accumulated savings depend on investment performance as well as period-to-period saving, but the gap between men and women is large enough to infer that women save less (period to period) than men.

This is not surprising given women’s lower participation in the labour force, the impediments to career development and full-time work because of child-care responsibilities, and an expectation that a male partner will provide a proportion of retirement savings. There is also a higher probability of women inheriting wealth from their partner than vice versa, implying less need to save out of current income.

Given many women’s reliance on male partners, it should also not be surprising that some women find themselves in an asset-poor position owing to divorce, even given current matrimonial property laws. In a US paper, Fethke (1989) notes that divorce carries a high price for both parties to marriage, not only because of the direct costs of the procedure, but also because some joint assets are illiquid and unmarried individuals find it more difficult to obtain credit. Even when the resulting drop in saving happens early in the life-cycle, “it can be costly in terms of retirement preparation”. In support of this, Browning and Lusardi (1996) cite evidence that divorced households experience lower asset growth than married households, even for the same level of income. We believe we should be able to apply this analysis to New Zealand, although we are not familiar with the matrimonial property laws in the US.

Arber and Ginn (1999) argue that women in Britain are economically disadvantaged because of the gradual shift from public to private pension arrangements. Women’s family roles constrain their ability to build private pension entitlements. They find that the median total income of an older woman fell from 77% to 62% of an older man’s between 1985-86 and 1993-94, largely owing to increasingly unequal income from private pension schemes. However, we note that by considering only personal money income, the authors neglect transfers between married partners.

⁴³ Note that the “savings” data the MIDAS model examines refers to the stock of accumulated savings held at a point in time.

Private pension access is also a problem in the US, where a minimum length of service is required before employer superannuation schemes are available. This “vestment” requirement is harder to meet for women because they are more likely than men to break their careers to have and look after children.

The MIDAS model suggests that, were it not for differences in income, New Zealand women would have about as much accumulated wealth as men in similar circumstances, at least until retirement. Beyond retirement, women do not run their wealth down as much as men. This is thought to be because they receive inheritances from their shorter-lived husbands. Overall, gender on its own does not appear to be an important determinant of saving behaviour.

Whether women and men are fundamentally different in psychological behaviour, or are just observed to be different because of their demographic and economic circumstances is, however, a major controversy in the study of women’s saving behaviour. We consider these matters further below.

Factors not explained

In a report on the savings of New Zealand and Australian women, Cooke, King and Peacock (1999) state:

“The Australian study suggests that the wealth holdings of single females are lower than their male counterparts in similar circumstances. While a large proportion of the overall difference in the male and female wealth holdings can be related to different levels of labour force participation and earnings, *the differences between single males and females in the same income groups and aged 35-39 years must be related to other attitudinal or behavioural factors*”. (our emphasis)

They find that both men and women have similar access to financial education and advice, and don’t seem to have higher tendencies to spend, at least on average. They conclude that men’s asset holdings are higher only because men invest in assets with higher yields (which over a number of years would make their wealth higher). This is an issue about the quality of saving, rather than the quantity, with the implication that gender does not affect saving very much.⁴⁴

Else and St John (1998) provide anecdotal evidence that women do not receive the same quality of financial advice as men, at least in New Zealand, and warn that women should “watch out for patronising advice from male investment advisors”. They also suggest that women have impeded access to housing as an investment: “Their incomes are generally lower, and their credit rating may be poor or non-existent, so obtaining finance... can prove difficult”. As with Cooke et al, both poor financial advice and lack of access to certain investment types are issues of quality rather than quantity. It is *savings* (total accumulated) rather than *saving* (period-to-period) that is affected.

Hannon (1995) argues that women in the US do not have good access to pension schemes (this is confirmed for New Zealand and Australia by the relative pension assets of men and women in Cooke et al). Hannon also claims that US women are nervous about saving and tend to take a cautious approach to it. They blame themselves if saving decisions go awry (as Lunt suggests non-savers do). They also, claims

⁴⁴ They do find that women have only about 30% of the private superannuation assets of men in both New Zealand and Australia, suggesting some impediment, based on gender, to superannuation schemes. This is not awarded much weight in their conclusions.

Hannon, expect men to provide. She refers to this as the “Knight in Shining Armour Syndrome”. In terms of particular saving, she cites evidence that female baby-boomers save for their children’s education, a car, a house and home improvements ahead of retirement, while men make retirement saving their top financial goal. Hannon finds that joining investment clubs, where investment advice and support are available, boosts women’s saving performance, claiming that “female investors have the right stuff once they overcome their aversion to risk”.

Glass and Kilpatrick (1998) list a number of sources to support their assertion that “numerous writers indicate that there are both economic and psychosocial reasons for women’s lack of planning and saving for retirement”.⁴⁵ They list the following psychosocial reasons (for the US):

- *Early socialisation/early education*: girls and boys are rewarded at an early age for typical female and male traits and job aspirations, thereby reinforcing traditional stereotypes. This, the authors argue, shuts off certain occupations to women in later life.
- *Self-esteem*: girls are found to be less confident than boys at school, especially in competitive situations. “If the areas of math and science are considered by females as the areas in which they are least confident, it is easy to see how financial planning would seem an intimidating undertaking.”
- *Role definition*: many women feel retirement planning is a male domain and avoid taking responsibility for their own saving. In addition, women’s income has often been treated as secondary, being spent on consumption rather than invested.
- *Locus of control*: women are more inclined to act according to what they think others expect. They are more likely to feel they have no control over their lives and to believe in fate. One consequence of this is that formal pre-retirement programmes where women are explicitly guided through the process may be more effective than informal ones (whereas men will often be happy to use informal ways of planning).
- *Risk taking*: from early in their lives, women are less likely to take risks than men. This appears to carry over into adulthood, with women typically investing in the safest investments possible (i.e. the ones that also offer the lowest return).

Lynn (1992) analyses a survey of men and women in 20 countries designed to measure competitiveness, the valuation of money and attitudes to saving. He finds men generally score higher for all three, although there are exceptions. He finds a strong correlation between scores for the three measures and suggests that one factor – possibly competitiveness – determines the other two. This is consistent with the low confidence of women in competitive situations noted by Glass and Kilpatrick (1998).

Maori

Factors explained by current models

Maori save less than Europeans. For example, the MIDAS model uses recent Maori saving behaviour to calculate that by age 65, an average Maori male who is 15 today will have saved only 78% as much as

⁴⁵ We are grateful to Dr Susan Gee for her advice on the psychosocial aspects of women’s saving behaviour.

an average European male of the same age. An average Maori female will have saved 86% as much as a European female. Maori save less than Europeans because they earn lower incomes when in work and are more often unemployed. These factors in turn can be at least partly explained by a relatively low level of educational qualifications (Else and St John, 1998).

Looking at the effect of race alone, the MIDAS model suggests Maori save slightly more than Europeans of the same age with the same income and marital status. However, there may be a problem with under-measuring Maori spending (marae spending such as koha and housie fundraising may not be well picked up in the Household Economic Survey from which saving is derived), thereby exaggerating saving. Another possibility is that saving for Europeans is biased downwards, particularly in the lower income deciles, by the tendency of more Europeans to be self-employed. The self-employed may understate their income and thus the calculation of savings. In any case, the effect of race alone boosts wealth at any point in time by only about \$350.

In other words, the fact that a person is Maori tends not to make their saving behaviour different, per se, from a Pakeha's. This accords with experience in other countries, although we hesitate to equate Maori experience with that of other racial groups.

As one example, Brimmer (1998) finds that even though the savings of Black Americans are low, they save about as much, given their incomes, as whites. The fact that the average Black American saves less than the average white can mostly be explained by standard features of the life-cycle model (low lifetime income). Brimmer does note that Black Americans have very little knowledge of the stock market and that this affects the quality of saving. But once again, this seems to be a result of their low incomes rather than their race. As their incomes rise, he argues, they will put more into share investments.

Dayal-Gulati and Thimann (1997) similarly note that standard economic variables accounting for differences in the policy environment, real per capita incomes and demographics⁴⁶ seem to explain 60% to 70% of inter-country differences in private saving rates in 14 Southeast Asian and Latin American countries.

Factors not explained

There is apparently very little literature on the non-life-cycle determinants of Maori saving.⁴⁷ This is perhaps not surprising, since we have seen that race does not appear to affect saving very much once other demographic effects are accounted for.

We note from our own observation that the collective nature of Maori communities (particularly in rural areas) may mean that saving behaviour will differ from the national average. Collective communities provide an unofficial social security scheme and may discourage saving by the individual. Saving does take place, but perhaps more so at the level of trusts, which then care for local kaumatua (providing transport, health care etc). Saving is mainly in the form of retained earnings on assets, which is not picked up in the Household Economic Survey or other sources of saving data.

Some contrary evidence comes from a Massey University study of 700 Maori households, which found that two-thirds of the 38 over-60-year-olds in the study had made some provision for retirement (Else and St

⁴⁶ Proxied by the ratio of retired to working age.

⁴⁷ For example the librarian at Te Puni Kokiri could not find any material on this issue at all.

John, 1998). The results should be treated with caution because of the small sample, especially since an earlier Massey study showed very few Maori over 60 years old had any private superannuation or insurance.

Other groups

We have no clear evidence of any non-economic/non-demographic determinants of saving for those in particular age or income groups, or for ethnic groups other than Maori. However, a person's age, income or ethnic group can clearly be correlated with other demographic factors and therefore determine saving behaviour. Using projections from the MIDAS model, which uses historical behaviour as a base, we briefly summarise the observed saving behaviour in these groups.

Age groups

The simplest formulation of the basic life-cycle model suggests that individuals should borrow and save to smooth consumption. Given that earnings are generally highest in middle age, we might expect to see low levels of saving or borrowing at younger ages and assets being run down. This is not too much at odds with our observations from the MIDAS model.

New Zealanders steadily accumulate savings, with annual increases in wealth at a maximum during the peak-earning period of 40 to 50 years of age. Retirement (at age 65 or earlier) reduces annual saving contributions, consistent with a reduced household income. Both men and women are observed to run down their assets from around the age of 80 as they start to eat into the capital sum invested during their lifetimes (i.e. dwindling interest and dividend income become insufficient). Men are seen to run their assets down more quickly than women – we hypothesise that older women often inherit money from a male partner, whereas men rarely live longer than female partners and therefore do not have the benefit of bequests to shore up their wealth.



Income groups

The basic life-cycle model suggests that lifetime income determines the level (although not the shape) of the saving path. Specifically, lower lifetime income leads to lower savings at retirement. When the inability to borrow, precaution, and welfare systems are considered, some households are expected to save very little or not at all (so-called “rule of thumb” households).

Applying the MIDAS model does show that people (both males and females) with higher incomes save more. However, it also shows that the behaviour of most males in the lowest income decile is inconsistent with the model used for all other individuals. In particular, it is necessary to include a dummy-variable for some males in the lowest decile in order to lower their estimated assets to observed levels. This may be an indication that some males in the lowest decile are “rule of thumb” savers – they earn so little that, given a welfare safety net, it makes no sense to save anything.

We should point out that interpreting the lowest income deciles is clouded by including some self-employed people. They are sometimes able to declare zero or negative income, but this is not a true reflection of their socio-economic status.

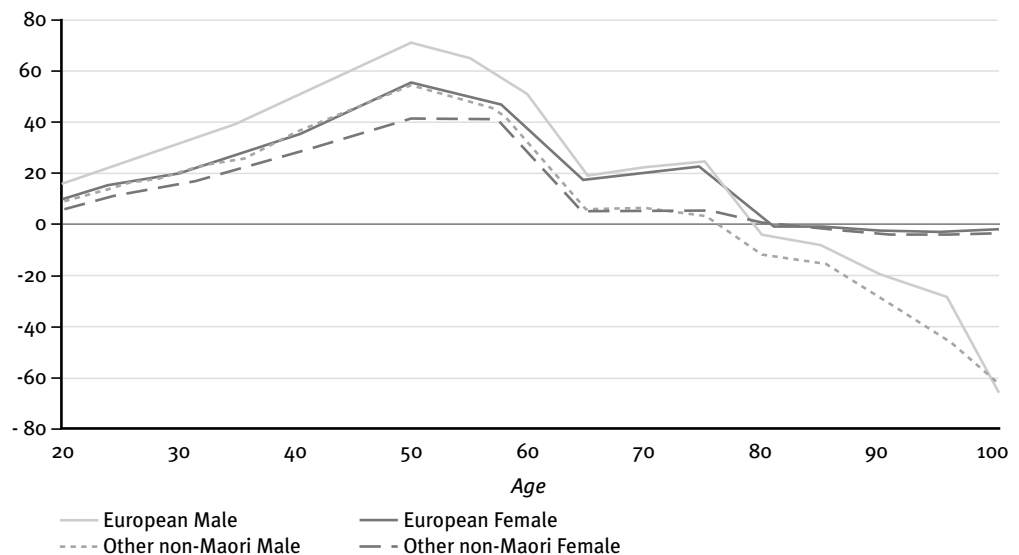
Non-Maori minority ethnic groups

It is clear that income is typically lower in Maori households than the national average, and that this should lower saving (which is in fact what we observe). However, household income levels are not so obvious in non-Maori ethnic minorities. This is because we can only observe results from the MIDAS model for a crude amalgam (“other ethnic groups”) which includes Pacific Islanders, Asians and so on.

Nevertheless, if we assume that the average income of individuals classified as non-Maori ethnic minorities is below the national average, the behaviour observed in the MIDAS model is consistent with basic life-cycle considerations. In particular, changes in wealth imply these minorities save less at all ages than Europeans, although the gap narrows in retirement.

Annual change in wealth (\$000)

MIDAS predictions (ISI 1998)



conclusions

The basic life-cycle model of saving underpins most analysis of saving behaviour in at least the past 20 years. The model is elegant in its simplicity, with little in the way of ad-hoc assumptions.

Essentially, the model maintains that individuals are interested in their future wellbeing as well as their current wellbeing. The implication for consumption and savings behaviour is that - to the extent to which people can estimate their lifetime wealth and value consumption today above consumption in the future - people will make saving decisions to smooth lifetime consumption. A permanently higher income will generate higher consumption and savings in each and every period, while temporary fluctuations in income will have little or no effect.

However, simple versions of the model have proved inadequate for coping with much of the data we observe. Fortunately, its explanatory power can be significantly improved by adding just a few new features. These include accounting for factors such as:

- precautionary saving incentives (higher perceptions of risk are likely to increase saving incentives)
- bequest motives (societies with a higher incidence of passing on wealth to following generations are less likely to spend their savings in old age and will therefore have higher rates of saving than other factors would imply)
- inability to save (credit constraints limit people's ability to borrow and so link consumption patterns more closely to actual, rather than expected, income levels)
- social security entitlements (decrease saving, particularly among low income people).

Of course it is quite possible to have more than one model that fits the data and there is no guarantee that the life-cycle model is the "correct" one. Some authors argue that the basic life-cycle model is not a true reflection of saving behaviour, suggesting we add more (non-economic) variables to the model, such as:

- social status
- social attitudes.

Others have difficulties with the model's underlying principles, arguing individuals are not as rational as we would like to think, and that the model neglects other "human" features such as an ability to control oneself.

If people are not rational, certain features of saving policy can make them save more:

- schemes where savings are "locked-in"
- financial education.

Saving behaviour clearly differs between groups in the population. The life-cycle model suggests that saving will vary by age while income is a key determinant of saving, through either liquidity constraints, welfare benefits or simply a scale factor.

It is tempting to say that gender or ethnicity also affect saving behaviour. To the extent that there are cultural "norms" that apply specifically to these groups, there may be some truth to this. However, we find that a lot of the variation in saving (compared to the population average) for these groups, at least in New Zealand, can be explained by standard features of enhanced life-cycle models. That is, the economic

circumstances of different groups, rather than purely ethnic or gender differences, appear to dominate observed differences in consumption and saving behaviour.

In New Zealand, for example, Maori appear to have higher saving tendencies than Europeans with the same income. This may appear counter-intuitive, but the reason why private saving by Maori in general is observed to be relatively low seems to more reflect average economic status. Cultural differences if anything reduce measured divergences in savings patterns.

Household saving rates appear to have fallen in the 1990s and a number of differing pressures have been identified. We cannot be definitive about the effect of various developments on savings, but the following factors may have an influence:

- Demographic developments as more New Zealanders reach their prime earning years.
- Changes to tax and benefit systems.
- A more efficient financial sector.
- Financial education programmes.
- Increased access to credit facilities owing to financial deregulation.
- Improvements in government finances (increasing confidence in the sustainability of fiscal settings).
- Wealth increases through income growth and house price rises.

Recommendations for education programmes

The Office of the Retirement Commissioner wishes to use the findings of this paper to improve the effectiveness of its education programmes. We discuss the implications of this review for the education programmes below.

1. The literature we reviewed tends to support the Office's role as educator. Our empirical analysis of existing education programmes and the idea (found in the psychological literature) that people are limited in their ability to make rational decisions, suggest that education is an important factor in determining saving behaviour. Specifically, education about how to decide on an adequate level of saving can help people make more responsible choices about their spending and saving.
2. Although educating people about saving is found to be important, the most powerful influence on saving behaviour is income (whether current or lifetime). This is apparent in both the basic life-cycle theory of saving and in empirical work. We note particularly that most differences in the saving behaviour of specific population groups can be explained by income. Therefore, it would appear useful to educate people about ways to improve their socio-economic status as well as saving in general.
3. International evidence suggests that the quality of investment decisions is an important influence on lifetime saving accumulation. Insufficient knowledge about the different types of saving vehicles may adversely affect returns on savings and the pace of saving accumulation. This may suggest another direction for the Office's education programme, such as by encouraging self-help groups. For example, some research has shown that women improve their saving performance when they join investment clubs, where they can obtain advice and support.

4. The literature did turn up some (admittedly controversial) material that implied lower income is not the sole explanation for women's lower saving rates. That is, that women respond to their circumstances differently from men in similar situations. Further research in this area is warranted, as is research into the so-far-unexplored psychological and social determinants of saving behaviour in the Maori or other ethnic minority populations. It may be necessary to offer different education programmes to some or all of these groups.
5. Some psychological literature suggests that individuals can lift the quantity of their saving by recognising that they lack self-control. This suggests a need to educate individuals about the pitfalls of easy credit, to encourage them to lock themselves in to regular saving activity and to encourage financial professionals to provide appropriate products. In cases of regular over-spending, addiction counselling may even be warranted.
6. A number of conclusions from our review could be used to educate policy-makers. They include:
 - general tax and welfare policies affect household and (probably) national saving. Specifically, lower general tax rates and lower welfare entitlements enhance household saving
 - specific tax incentives designed to raise household saving will (probably) be ineffective
 - a significant proportion of the population (30% or more in overseas literature) does not or cannot implement a long-term saving plan
 - better economic performance that lifts New Zealanders' socio-economic status will lift their saving because of its close relationship with income.

Appendix

– model specifications

The basic life-cycle model

The typical formulation of the inter-temporal (life-cycle) model of consumption (due to Hall 1978) is:

$$\max_{C_t, W_t} E_t \left[\sum_{s=0}^T \beta^s U(C_{t+s}) \right]$$

subject to an income constraint:

$$C_{t+s} + W_{t+s+1} = Y_{t+s} + (1+r_{t+s})W_{t+s} \quad (\text{equation 1})$$

where:

C_{t+s} is consumption of goods and services at time $t + s$

W_{t+s} is wealth (accumulated assets) at time $t + s$

Y_{t+s} is income at time $t + s$

r_{t+s} is the interest at time $t + s$

$U(C)$ is a utility function calculating the benefit from consumption (C)

β is a discount factor, usually assumed to be less than 1. That is, consumers are assumed unambiguously to prefer current consumption to future consumption, all else constant.

E_t is the expected value of the summation at time t , which the individual forms based on all available information (i.e. the consumer is rational).

In simple terms, each person chooses consumption and saving in the current period in order to get maximum benefit from consumption in this period and following periods, for a given expected income and interest rate. This takes into account that people prefer consumption now to consumption later.

Calculating the expectation term provides some difficulties, but the model can be solved if we assume that expectations are always correct, or make the specific assumption that utility is a quadratic function of the form:

$$U(C_t) = C_t - \frac{\phi}{2} C_t^2, \phi > 0 \quad (\text{equation 2})$$

The way to get maximum benefit from consumption is to smooth consumption over all time periods. Two assumptions are critical here: diminishing marginal utility and a stable – unchanging parameters over time – utility function.

Taking the simple case where $\beta = \frac{1}{1+r}$, consumption is equalised in all periods. The reasoning is thus: if utility is calculated using the same function in all periods, and marginal utility is diminishing, and one consumes more in one period than another, one can improve total benefits by transferring some consumption to the lower-consumption period where marginal utility has not diminished as much (is higher).

If $\beta > \frac{1}{1+r}$, the consumer values future consumption relatively more, and consumption gradually rises over time. Consumption falls gradually over time if $\beta < \frac{1}{1+r}$, where the consumer is relatively impatient to consume (future consumption is discounted more).

Adding uncertainty

We allow for uncertainty by removing the requirement for certainty equivalence – quadratic utility functions. Only if non-quadratic utility functions are used is it possible to have strictly convex marginal utility functions ($U'(C)$). When $U'(C)$ is strictly convex, we say that people are “risk averse”. $U'(C) = \ln(C)$ is an example of a function for which risk-averseness holds. Risk-averse agents will save more (or borrow less) than agents with quadratic utility functions.

Liquidity constraints

If some households are liquidity constrained, their consumption is likely to be closely related to their income. This is clearly not the behaviour implied by the basic life-cycle model (where changes in consumption should not be predictable from temporary changes in income). If liquidity-constrained households are assumed to follow the rule of thumb that they spend all of their income each period, consumption can be defined as:

$$C_t = \lambda_t Y_t^d + (1 - \lambda_t)(1 - s_t) W_t^p \quad (\text{equation 3})$$

Where:

λ_t = proportion of liquidity constrained households at time t

Y_t^d = disposable income (ie after tax) at time t

s_t = marginal propensity to save private wealth

The dynasty model

The fact that households have altruistic motives can change their consumption and saving behaviour. The following simple model can be found in Obstfeld and Rogoff (1998), and is originally due to Barro (1974):

$$\max_{C_t} [U_t = u(C_t) + \beta U_{t+1}], 0 < \beta < 1$$

subject to the income constraint:

$$(1 + r)H_t + Y_t - T_t = C_t + H_{t+1} \quad (\text{equation 4})$$

Where variables are as in the simple model except:

H_t is the bequest left to the individual by their immediate ancestor

H_{t-1} is the bequest the individual leaves to their immediate descendant

T_t represents income tax payments.

Here, we make the simplifying assumption that individuals live only one period, but that they desire to maximise the benefits of their own consumption in the current period, as well as the benefit of their (single) descendant's consumption in the next, accounting for the fact that consumption now is preferred to consumption later (ie. a discount rate, δ , explains the degree to which they value consumption today more highly than tomorrow).

In the case without uncertainty, repeatedly substituting for current utility in terms of future utility and consumption, one obtains an identical solution to that of the basic life-cycle model, but with an infinite number of time periods rather than T periods. Consumption is not just smoothed over a lifetime, but forever (including all future generations).

Actuarial fairness

Correctly adjusting a payment to account for life expectancy.

Adverse selection

This is best illustrated by an example of retirement saving. Those individuals who will live longest are most likely to benefit from retirement annuities (see below), as they will receive more years of income from their fixed lump sum payment than other individuals. In contrast, individuals who live for a very short time will gain only a few years of income from their fixed lump sum payment – they may actually lose money.

This will encourage individuals with higher life expectancy to buy annuities and those with low life expectancy not to. Since the average life expectancy of annuity purchasers is higher than the average life expectancy of the population, the annuity seller needs to raise its price (lump sum payment) above the actuarially fair level for an average person.

Aggregate (adj.)

Literally, added up. For example, aggregate household income is the sum of the individual incomes of each and every household in New Zealand.

Annuity

A guaranteed series of payments in the future purchased immediately for a lump sum. A “life” or “retirement” annuity continues until the death of the person by whom it was purchased. Since the lump sum paid for an annuity is fixed and the date of death is uncertain, the annuity provider (rather than the purchaser) is effectively assuming the risk that an individual will live for a very long time.

Balance sheet

A statement of a company’s or an individual’s wealth on a given date. The balance sheet consists of assets and liabilities.

Bounded rationality

The theory that individuals have limited capabilities when making economic decisions – in particular, that individuals could not cope with the complexity of the models economists assume they use.

Cohort

Refers to people born in the same time period, e.g. those born in 1975 or more broadly the 1970s.

Consumption

The physical process of using a good or service. In practice consumption is deemed to refer to spending on goods and services used up within a specified, usually short, period of time.

Demographic

Relating to the use of population statistics to determine the conditions of life in a community.

Diminishing returns

The hypothesis that, after a certain point, the additional benefit of an extra unit of a good reduces as the amount of the good already purchased rises.

⁴⁸ Some of these definitions are found in *A Dictionary of Economics, 1977, Harmondsworth, England: Penguin.*

Dynamic analysis

Analysis which is concerned with looking at the movement of economic systems through time.

Econometrics

The application of mathematical and statistical techniques to economic problems.

Equilibrium

A state in which forces making for change in opposing directions are perfectly in balance. For example, a market is in equilibrium if the quantity of the product that individuals want to buy is the same as the quantity that individuals wish to sell. If the market were not in equilibrium, the law of supply and demand would imply a price change to resolve the over- or under-supply.

Flow

In economics, the change in a stock (see below). For example, a person's saving may be defined as the change in their stock of wealth. Saving is a flow.

Income effect

See substitution effect.

Kaumatua

In simple terms, the respected older members of a community in Maori society.

Macroeconomic

The part of economics that is mainly concerned with the study of relationships between broad economic aggregates, the most important of which are national income, national expenditure, national saving, aggregate employment, the quantity of money, the average price level and the balance of payments.

Marginal unit

A small change in the quantity of some variable. For example, when one considers the effect on saving of a \$1 pay rise, one is considering the effect on saving of a marginal rise in income.

Microeconomic

The part of economics concerned with studying individual "decision units" – the consumer, individual households and firms – and the way their decisions interrelate.

Moral hazard

When the implementation of a policy induces people to behave in a way that is at odds with the policy's objectives or social preferences.

For example, in the absence of any welfare safety net and precautionary motives for saving, even a family only marginally above the breadline will have an incentive to save some money. Such saving will ensure a smooth lifetime consumption path. However, if the government introduces an asset-tested welfare benefit, it is likely that some of these households will find it in their interests to reduce saving so they will qualify for a benefit in the event of an income drop. Effectively, the government's welfare policy has made people less reliant on themselves, with the result that the government will need to pay a higher level of benefits than it may have originally envisaged.

Optimisation

Trying to obtain the best outcome with reference to some goal. In a mathematical sense, obtaining the maximum value of a variable.

Precautionary savings

Savings motivated by a desire to have some security from unforeseen outcomes that adversely affect incomes or wealth, e.g. as safeguards against the risk of unemployment or illness.

Rational behaviour

In simple terms, rational behaviour in economics equates to using all available information sensibly when making decisions. A looser definition is that rational people learn from their mistakes, i.e. they do not persistently take actions that are not in their best interests.

Ricardian Equivalence

A term used today mainly to describe the offsetting impact of household saving on national saving in response to a change in fiscal policy. It implicitly assumes that households increase (or decrease) their saving in response to a government tax cut (or rise) because they expect to have to fund the resulting government deficit (or surplus) at some time in the future. If the change in household saving completely offsets the change in government saving, Ricardian Equivalence is said to hold. Otherwise, Ricardian Equivalence is only partial.

Saving

The amount an individual saves in a single period (e.g. annual saving is the proportion of my income that I do not spend).

Savings

The amount an individual has accumulated over a period of time (e.g. total bank deposits and share investments). Roughly equivalent in concept to wealth.

Static analysis

Concerned with the behaviour of a system at a point in time, often but not always in equilibrium.

Stock

In economics, an accumulation of products, assets or liabilities. For example, the national debt is a stock. A current account deficit, which adds to the debt, is a flow (see above).

Substitution effect

When the price of a good changes, it has two effects.

1. The price change makes the good more or less attractive relative to other goods, thereby changing the amount bought. This is the substitution effect. For example, halving the price of butter might be expected to make it more attractive relative to margarine, thereby boosting butter sales and (for a fixed real income) reducing margarine sales.
2. The price change affects a person's real income, allowing them to buy more or forcing them to buy less. This is the income effect. For instance, halving the price of butter not only boosts butter sales because of increased attractiveness relative to margarine, it also leaves the buyer with more disposable income.

Ironically, the buyer may choose to buy margarine with that extra income so that, overall, sales of margarine do not fall. That is, it is possible that after both income and substitution effects are accounted for, sales of butter and margarine will rise.

Utility

The satisfaction derived from consuming some quantity of a good or service.

Wealth

A person's total stock of tangible and intangible possessions that have a market value. Often simplified, for measurement purposes, to include solely financial and housing wealth.

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