

Beyond Reasonable Debt:

The extent to which financial behaviour can explain over-indebtedness amongst New Zealand families

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Abstract

Data from the Ministry of Social Development's Survey of Living Standards 2004 are used to test the degree to which financial behaviour can explain over-indebtedness amongst families in New Zealand.

In this study, families are considered to be over-indebted or in 'problem debt' if they reported having any of the following happen to them in the last 12 months: not keeping up with utility, mortgage, rent or credit payments; borrowing from family or friends or pawning or selling something to meet every day living costs; or receiving financial help from community organisations.

The respondent's age and social marital status, the respondent's family income, debt and asset position, and the number of children in the respondent's family were all found to be significant in multivariate analysis, but to have little marginal effect on whether families are over-indebted. By contrast, spending rather than saving behaviour by the respondent was found to be significant and increase the likelihood of a family being over-indebted by more than 20 percent, holding everything else constant.

A similar effect was found when over-indebtedness or 'problem debt' was defined as families who also reported using any mainstream credit or being in a negative equity situation.

Prudent financial behaviour therefore appears to be an important resilience factor in avoiding over-indebtedness or problem debt, however narrowly defined. Current saving messages could better be tailored to groups according to their saving behaviour. Policy efforts to strengthen saving behaviour, on the other hand, require a better understanding of financial knowledge and decision-making within the family.

This study has highlighted some possible limitations with using economic family unit income and wealth data. However, assuming these limitations can be addressed, the study has also highlighted the potential to use the LSS 2004 data to further investigate what influences financial behaviour.

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1. Introduction

The purpose of this research is to find out how the Families Commission and Retirement Commission can help families avoid becoming over-indebted, by identifying what makes some families more resilient to this situation.

This research follows an earlier literature and data review by both the Commissions on the indebtedness of New Zealand families.² In that report a range of factors were identified that might distinguish families who use debt well from those who do not. Of particular interest was the association found between some behavioural traits and 'problem debt'.

Both Commissions were keen to explore this association in a New Zealand context. Data from the Ministry of Social Development's Living Standards Survey (LSS) 2004 were found to provide some information on financial behaviour, in addition to information on family composition and financial circumstances.

The specific research question this paper addresses is whether it is possible to isolate the effect financial behaviour has on the likelihood of a family being over-indebted.

Section 2 defines what is meant by family over-indebtedness and how this can be measured using LSS 2004 data. Section 3 examines the relationship between financial behaviour and family over-indebtedness, based on international theory and evidence and bivariate regression analysis using LSS 2004 data. Section 4 looks at what might confound the relationship between financial behaviour and family over-indebtedness, based on international theory and evidence and multivariate regression analysis using LSS 2004 data.

Section 5 discusses the implications of the findings from this research for policy and Section 6 presents conclusions and ideas for further research.

2. Family over-indebtedness in the Livings Standards Survey 2004

This section outlines the Livings Standards Survey 2004 data and how they can be used to measure family over-indebtedness or 'problem debt'.

2.1. Livings Standards Survey 2004

The Living Standard Survey (LSS) 2004 was carried out by the Ministry of Social Development (MSD) to collect information on New Zealanders' standard of living and on factors likely to explain variations in living standards within the population and between different groups. The LSS 2004 followed the LSS 2000 from which the Economic Living Standards Index (ELSI) was developed. A LSS 2008 has been completed and findings are expected in late 2009.

² Beyond Reasonable Debt: A background report on the indebtedness of New Zealand families, December 2008, published online www.nzfamilies.org.nz/beyondreasonabledebt.

4,989 respondents were interviewed for the LSS 2004, representing a response rate of 62%. Weights were developed against benchmarks from the 2001 Statistics New Zealand Population Census (MSD, 2006, p2).

The research presented in this paper is based on a reduced and re-weighted dataset that MSD has made available for external research purposes. This is because 6% of survey respondents did not consent to their responses being used by other researchers. Hence the reduced survey population is 4,654, representing 4,654 family groups or economic family units (EFUs) and 11,248 family members (including children). The weightings adjust the survey to a total population of 4,060,890 with 2,110,390 EFUs and 2,993,770 adults.

It should be noted that although the survey data are five years old at the time of this analysis, they are still relevant in exploring relationships between variables.

2.2. Families in the Livings Standards Survey 2004

A 'family' or family group (or EFU) in the LSS 2004 consists of the survey respondent and their partner or spouse (if any), and their children under the age of 18 (if any). Where children under the age of 18 have their own partner or children living in the household, or they are working full time, they are considered financially independent and are treated as a separate family group. Single people are their own family group.³

In addition to collecting information on the composition of the respondent's family group, the LSS 2004 collects information on the composition of respondent's household. Most of the questions in the survey, however, are limited to the respondent and/or their partner or spouse (ie the family level). Aside from household composition therefore, it is not possible to conduct detailed analysis of survey responses at the household level (Perry, 2007). For instance, it is not possible to calculate household income if more than two family units reside at the same house. 1155 of the 4654 (25%) respondents surveyed live with others – that is, they live in multi-EFU households.

While the strength of the survey is the information it provides at the family or EFU level, one has to be careful when using the data to provide insights on or to measure 'family' material wellbeing if resources and/or expenses are shared between multiple family units or EFUs living in the same household. In the context of the research outlined in this paper, this may have implications for the expected relationship between family income and assets and 'problem debt', which is discussed further in Section 4.

³ Based on documentation provided with the survey questionnaires.

2.3. Over-indebtedness in the Livings Standards Survey 2004

There are a number of ways of defining over-indebtedness or problem debt. What is important is that any definition be clearly defined for the purpose of the study at hand (Valins, 2004, p6).

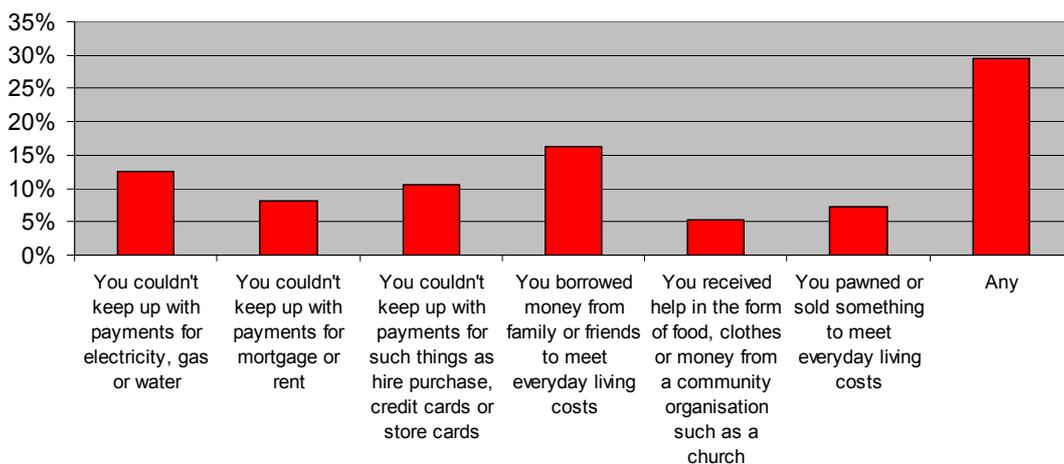
Broadly defined (“problem debt definition 1”), over-indebtedness or problem debt can be thought about as any situation where a person or family is unable to financially make ends meet. They simply do not have sufficient income to cover their expenses, and they do not have access to or they have already exceeded/exhausted financial options to tide them over (such as overdraft and credit cards). Faced with this situation a person or family is unlikely to meet deadlines for bill payments and/or will seek family, community or government support. In some sense, this situation can be thought of as a type of informal debt (or informal line of credit).

The LSS 2004 data effectively capture this information as “financial strain”. Q138 in particular asks the respondent whether they have experienced any of the following in the last 12 months:

- You couldn’t keep up with payments for electricity, gas or water
- You couldn’t keep up with payments for mortgage or rent
- You couldn’t keep up with payments for such things as hire purchase, credit cards or store cards
- You borrowed money from family or friends to meet everyday living costs
- You received help in the form of food, clothes or money from a community organisation such as a church
- You pawned or sold something to meet everyday living costs.

Figure 1 shows that the proportion of families who experience any particular outcome is between 5% and 17%. Figure 1 also shows that almost 30% of all families have experienced at least one form of “financial strain”.

*Figure 1: Proportion of families in financial strain
Living Standards Survey 2004 (n=varies, weighted by EFU=varies)*



A more restricted, but perhaps more semantically accurate definition of over-indebtedness is to simply look at those individuals or families who experience financial strain despite having access to debt (or formal lines of credit) (“problem debt definition 2”). That is, people who exhaust the financial options they have available to them. This group is interesting from a policy perspective because they have presumably already identified their own financial limitations by arranging formal access to credit in the first place.

The LSS 2004 provides good information on families’ access to mainstream credit, including mortgages, bank loans, student loans, hire purchase, credit cards and store cards.⁴ Unfortunately the LSS 2004 does not capture information on ‘non-status’ or ‘third-tier’ credit, such as that provided by loan sharks.

This data limitation means that an obviously vulnerable group would be ignored. However, given that lack of income and assets are likely to be a key reason that this group of families do not have access to mainstream credit, an independent or ‘pure effect’ effect of financial behaviour might be harder to isolate. In other words, limiting analysis to a more homogenous group will mean the regression model will have to work harder to find factors that make families ‘resilient’ to problem debt.

Figure 2: *Defining problem debt*

	<i>Problem debt definition 1</i> All families 4654 100% of EFUs	<i>Problem debt definition 2</i> Families using mainstream credit 3240 70% of EFUs	<i>Problem debt definition 3</i> Families in negative equity (ie owe more than own) 1547 33% of EFUs
Financial strain	1177 25% of EFUs	1029 22% of EFUs 32% of families using credit 87% of families in strain	752 16% of EFUs 49% of families in negative equity 64% of families in strain
No financial strain	3477 75% of EFUs	2211 47% of EFUs 68% of families using credit 64% of families in no strain	795 17% of EFUs 51% of families in negative equity 23% of families in no strain

⁴ Specific survey questions used are Q151 (total debt excluding mortgages, student loans and overdrafts), Q130 (total mortgage debt) and Q144 (student loans). The only omission in the dataset is in respect of overdrafts. Information is available on useage (Q148), but not on amount. Due to some inconsistencies between debt usage and debt amounts in the dataset, debt amounts were used for analysis of debt in this study.

Taking this argument further, an even more stringent definition (“problem debt definition 3”) is to look at those who not only access debt, but who report financial strain in addition to being in a negative equity position.⁵

As expected, Figure 2 shows that proportionately more families in negative equity report any form of financial strain (49%), compared to 32% of families using mainstream credit and 25% of all surveyed families. However, looking at figure 2 from a ‘resilience’ perspective, a much greater proportion of all families experienced no financial strain compared to those who had access to debt.

Rather than selecting a single definition of ‘problem debt’, then, this report compares results for the different definitions.

It should be noted that any of the measures of problem debt may be temporary only. Over time families move in and out of different financial states, depending on their age, life stage and random events. Additional data (ideally longitudinal) are required to assess the persistence of different financial states for different families over time, as well as the degree to which the proportion and types of families in different states changes over time. This is beyond the scope of this research paper.

2.4. Summary

Family over-indebtedness rather than individual or household over-indebtedness is examined as the unit of analysis in this research. Using LSS 2004 data, this effectively means that this research is looking at the financial situation of the respondent and their spouse (if any) and ignores the financial contribution or burden from other household members. The LSS 2004 does not capture this additional information.

Due to the range of possibilities for defining over-indebtedness, this paper examines the results of three possible definitions of over-indebtedness (or ‘problem debt’):

- Financial strain only (“problem debt definition 1”)
- Financial strain plus use of mainstream credit (“problem debt definition 2”)
- Financial strain plus negative equity (“problem debt definition 3”).

3. The role of financial behaviour

This section outlines the theoretical and empirical basis for the relationship expected to be observed in New Zealand between financial behaviour and over-indebtedness or problem debt. The suitability of LSS 2004 data to measure this relationship is then discussed, followed by regression results. (Confounding effects of factors like income are discussed in Section 4.)

⁵ A negative equity situation is where liabilities are more than assets. Liabilities were also calculated from responses to survey questions Q151, Q130 and Q144 (see note 3). Assets were calculated from responses to questions Q127 (housing assets) and Q137 (non-housing assets). Approximately 10 observations where a respondent claimed to have a mortgage but not a housing asset were removed from the analysis.

3.1. Basic model

The basic model being tested is that the likelihood of families experiencing over-indebtedness is a function of their financial behaviour:

$\text{Prob}(\text{over-indebted}) = F_n(\text{financial behaviour}),$

or, more specifically,

$$\text{Prob}(\text{over-indebted}) = \alpha + \beta \text{ financial behaviour} + \varepsilon, \quad (1)$$

where α is the intercept, β is the slope coefficient on financial behaviour or the degree to which a change in financial behaviour is correlated with a change in the likelihood of being over-indebted, and ε is the error term or the change in the likelihood of being over-indebted that cannot be explained by financial behaviour.

3.2. Theory and evidence

The theory and evidence on the role of behaviour in financial decision-making is limited, but compelling.

There is increasing evidence, notably from the fields of psychology and neuroscience, that decision-making behaviour is not as 'rational' as economists like to assume (see for example: Akerlof, 2001).

Financial decision making is influenced by habits (basic budgeting approaches such as living within your means), heuristics (basic rules of thumb such as saving 10% of gross income), and coping mechanisms (strategies or behaviours adopted to avoid or encourage a particular course of action such as using a shopping list or avoiding certain shops to avoid overspending). The Centre for Policy Development in Australia has recently published a paper which provides a good discussion of why these habits, heuristics and coping mechanisms may or may not result in so-called rational behaviour (McAuley, 2008).

Psychologists, neuroscientists and 'behavioural' economists alike argue that these habits, heuristics and coping mechanisms are in turn influenced by a range of personality and environmental factors.

These were discussed more fully in the earlier report by the Families Commission and Retirement Commission⁶, but to briefly recap, personality factors include:

- locus of control (the degree to which people consider they are in control of their own life and actions)
- aspirations (the degree to which people form aspirations based on comparisons with others)
- self-control (the degree to which people are impulsive or do not stick to long-term goals).

⁶ Ibid.

Environmental factors include:

- context relativity (the degree to which people's decisions are influenced by the context in which they are presented)
- shared experiences (the degree to which people's decisions are influenced by the experiences of family and friends)
- family decision-making (the degree to which people's decisions are influenced by family processes and priorities)
- consumer socialisation (the process by which people develop an understanding of the economic world)
- aggressive lending and advertising (the degree to which people's decisions are directly influenced by the actions of others).

The research in this paper focuses on personality factors, not because they are in some way more important than environmental factors, but because of the limitations with the LSS 2004 to properly examine them.

Again, to summarise the key findings in Commissions' earlier report, having an external locus of control (a tendency to believe your life is outside of your control), having aspirations based on comparisons with others, or having poor self-control (a tendency to be impulsive) have all been found to be associated with spending rather than saving habits:

Lunt and Livingstone (1992) compared those who saved regularly and those who did not in the UK and found that savers have more internal locus of control than non-savers, while non-savers tend to be fatalistic. In general, savers believe in personal control over finances, in budgeting and in keeping things simple, whereas non-savers tend to make life more complicated and feel less under control.

Livingstone and Lunt (1992) also found that those in debt not only experience pleasure in consumption but also express their social worth and social relations through consumption, buying presents for themselves and others as rewards or bribes. Debtors also tended to talk more about money with friends. The authors comment that being in debt appears linked to socio-psychological participation in consumer culture more generally.

Pinto et al (2004) found that students who tended to carry forward large unpaid balances were thought to make impulse purchases and use their credit cards to buy more than they could afford. Although these students were aware of the downsides of their usage level, they appeared unable to regulate or modify their behaviour in using credit.

Perhaps surprisingly, Pinto et al's study does not support previous studies showing that the psychological factors of self-esteem and locus of control were inversely related to shopping behaviour and credit card spending. Regardless of their type of credit card use, the students reported very high self-esteem and stronger internal locus of control. This suggests that there may not be a straightforward relationship between locus of control, aspirations and self-control.

In terms of self-control, neuroscientists have recently isolated the brain circuit involved in thinking twice and checking impulsive action (Brass & Haggard, 2007). This provides a sound basis for the 'hyperbolic consumption model'

developed by behavioural economists to model self-control problems (or ‘irrational’ consumer behaviour). According to this model, ‘hyperbolic’ consumers are like their ‘exponential’ counterparts in that they prefer instant gratification over achieving long-run goals (in other words, they have high discount rates or prefer consumption in the short term). Unlike their exponential counterparts, however, hyperbolic consumers also have time-inconsistent preferences – that is, their preferences change depending on whether they are asked what trade-off they would make now or in the future. (See for example: Angeletos, Laibson, Tobacman, Repetto & Weinberg, 2001.)

Even if the relationship between locus of control, aspirations and self-control is complex, the potential link between any of these behaviours and over-indebtedness is appealing from a policy perspective because of the potential to alter behaviour (through appropriate education programmes, for example). The link has not been thoroughly examined in the literature, however. A major limitation is the availability of robust data on behaviour. The LSS 2004 data offer some scope to examine this.

3.3. Behaviour in the Living Standards Survey 2004

The LSS 2004 provides information on personal style⁷ and insurance⁸, both of which tell us about families’ financial practices, which in turn could provide some insight into their underlying behaviour.

Personal style

Figure 3 summarises “all of the time” and “most of the time” responses to the personal style questions. These responses were considered to best reflect families’ regular behaviour. This information suggests that the majority of families⁹ report prudent financial practices: knowing they can afford something before they buy it, knowing where their money goes, reading statements and paying bills on time.

While these responses effectively represent different financial practices, they do not necessarily represent different underlying behaviours or personality traits. To simplify the analysis, the research in this report has focused on responses to the statements about saving and living from one pay to the next.¹⁰ There are a few reasons for doing this.

From a policy perspective it is of interest whether families who save are less likely to experience financial strain – that is, whether saving behaviour is an important resilience factor. Interestingly, the proportion of families who save appears relatively low: between 30 and 40%. As already mentioned, there is some evidence that in terms of underlying behaviour or personality—income constraints aside or *ceteris paribus*—that those with internal locus of control are more likely to save than those with external locus of control (Lunt and Livingstone, 1992).

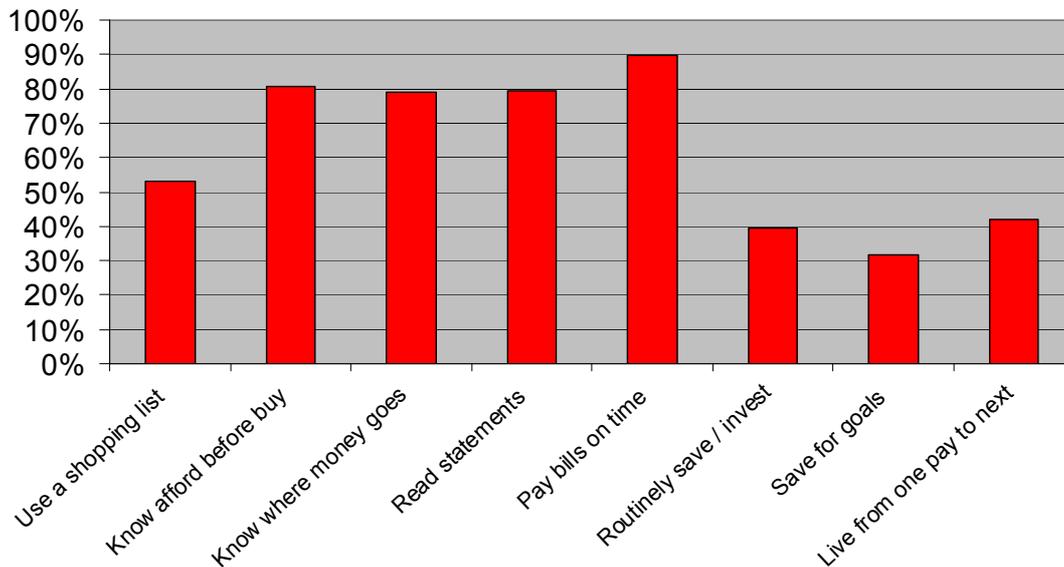
⁷ Q162, LSS 2004 Questionnaire

⁸ Q112, LSS 2004 Questionnaire

⁹ It should be noted that information on personal style only pertains to the respondent, not the partner. It is possible that the respondent has sound financial behaviour, but is not mainly responsible for financial decision making in the family.

¹⁰ Future analysis could examine the other financial practices more closely.

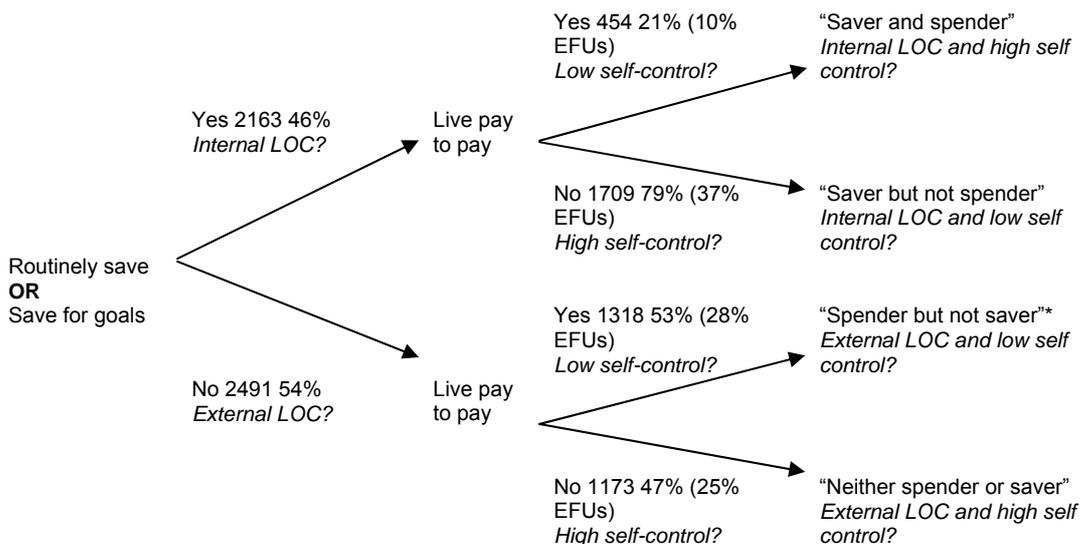
Figure 3: *Proportion of families with different financial behaviour reported “most” or “all” of the time*
Living Standards Survey 2004 (n=varies, weighted by EFU=varies)



A related question is whether those who live pay to pay are more likely to experience financial strain – that is, whether spending behaviour is a significant vulnerability factor. It could also be argued that people who have low self-control (or are impulsive) are more likely to live pay to pay than those with high self-control—again income constraints aside or *ceteris paribus*.

Figure 4 illustrates these financial practices and potential underlying behaviours. Figure 4 shows that while most of those who save do not live pay to pay (79%), only around half of those who do not save live pay to pay (53%).

Figure 4: *Saving and spending behaviour*



Somewhat simplistically then, it seems that being a saver (having internal locus of control) means that you are unlikely to be a spender (having low self-control); but that not being a saver (have external locus of control) does not mean that you are more likely to be a spender. It is interesting to test then which behavioural combination is most strongly associated with problem debt. Consideration was therefore given to the two-way relationship with financial strain, as illustrated in Figure 5. It is clear from Figure 5 that none of the behaviours have a one-one relationship with financial strain, but that saving is a likely resilience factor (hence a negative relationship is expected with problem debt) and spending a vulnerability factor (hence a positive relationship is expected with problem debt).

Figure 5: *Behaviour and strain*

	All EFUs	“saver” EFUs	“spender” EFUs	“saver and spender” EFUs	“saver not spender” EFUs	“spender not saver” EFUs	“neither spender nor saver” EFUs
Financial strain	1177 25%	254 12%	854 48%	133 29%	121 7%	721 55%	202 17%
No financial strain	3477 75%	1909 88%	918 62%	321 71%	1588 93%	597 45%	971 83%
TOTAL	4654	2163	1772	454	1709	1318	1173

Insurance

Having insurance arguably also represents fiscally prudent behaviour, and having more insurance represents even more fiscally prudent behaviour. It could be argued that people with internal locus of control are also more likely to get insurance—again controlling for income or *ceteris paribus* (being able to afford insurance could be a significant confounding factor and is discussed in Section 4).

The LSS 2004 provides good information on families’ insurance behaviour.¹¹ The variable created is a dummy or binary variable of whether a family has insurance or not. While this variable is being used as a proxy for a family having internal locus of control (ie being in control of their own financial fortunes), the negative relationship expected with financial strain is to some extent a given because purchasing insurance presumably insures a person against having financial strain.

¹¹ Q112, LSS 2004 Questionnaire. The type and amount of insurance purchased is not explored in study, but could be looked at in future analysis. Unlike personal style, this information refers to the respondent **and** their partner. A stronger case could therefore be made that this variable in fact captures ‘family’ locus of control.

3.4. Estimation

The regression model set out in equation (1) can be re-specified in a number of ways, depending on the data used to approximate financial behaviour:

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“saver”} + \varepsilon. \quad (1a)$$

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“saver and spender”} + \varepsilon. \quad (1b)$$

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“saver but not spender”} + \varepsilon. \quad (1c)$$

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“spender”} + \varepsilon. \quad (1d)$$

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“spender but not saver”} + \varepsilon. \quad (1e)$$

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“neither saver nor spender”} + \varepsilon. \quad (1f)$$

$$\text{Ln}(\text{problem debt}) = \alpha + \beta_1 \text{“insurance”} + \varepsilon. \quad (1g)$$

The financial behaviour variables are all dummies or binary variables (0=no, 1=yes).

The basic model being estimated is effectively a logit model, as the dependent variable (financial strain) is also a dummy or binary variable with values 0 or 1. In other words, the problem that the model is trying to solve is the probability or likelihood that a family experiences financial strain, or that the family gets a value of 1.

It should be noted that the sample data used in the regressions are un-weighted; and that families that “don’t know” or “refuse” information, are omitted from regression analysis.

It should also be noted that finding a statistically significant relationship between the explanatory variable(s) and problem debt does not automatically suggest a causal relationship. The theory and the data provide the strongest basis for asserting a causal relationship. The theory still appears to be unproven, but the reported experience of financial strain had to be in the last 12 months, and in the case of personal style, “most” or “all of the time” responses were selected to reflect persistent rather than fleeting or transitory behaviour. A weak causal relationship is therefore being assumed.

3.5. Results

Figure 6 shows the results of a series of separate bivariate regressions on different definitions of problem debt using different specifications of financial behaviour. As expected, saving behaviour is negatively correlated with financial strain and spending is positively correlated. Interestingly, the largest marginal effect for the first definition of problem debt (financial strain only) was achieved from the behavioural variable “spender not saver”. On its own, this variable appears to account for 42% of the likelihood of experiencing financial strain. Theoretically, these families have external locus of control and low self control.

Being a “saver” on the other hand (and being a “saver but not a spender”, which few “savers” actually are) also accounts for around 30% of the likelihood of not experiencing financial strain. Theoretically, these families have internal locus of control and high self-control.

The effect of having “insurance” is also interesting. Theoretically, families who purchase insurance have internal locus of control. Similar to the “spender not saver”

variable, it appears to account for 41% of the likelihood of not experiencing financial strain. Unlike the spending and saving behaviours, however, the size of the effect appears to increase the more tightly problem debt is defined.

It should of course be noted that these regressions are bivariate only and provide a useful indicator of the effect and power of the explanatory variables – they are not in themselves strong models of problem debt. In most of the regressions the percentages of correct predictions from the models barely improved on the naïve estimate—the proportion of “1s” in the problem debt variables. Also, as the next section outlines, the effects are likely to be confounded by other variables.

To simplify multivariate analysis in the next section, only the behavioural variables “spender not saver” and “insurance” are utilised.

Figure 6: Marginal effects of behavioural variables in bivariate regressions (n=3907)

Regressions: (all dummies)	Problem debt definition 1 (observations at one=1055)	Problem debt definition 2 (observations at one=921)	Problem debt definition 3 (observations at one=664)	Case values: (1=yes, 0=no)
(1a) “saver”	-0.27***	-0.24***	-0.21***	0
(1b) “saver and spender”	0.03	0.02	-0.01	0
(1c) “saver but not spender”	-0.30***	-0.27***	-0.21***	0
(1d) “spender”	0.38***	0.34***	0.28***	0
(1e) “spender not saver”	0.42***	0.38***	0.33***	0
(1f) “neither saver or spender”	-0.11***	-0.10***	-0.09***	0
(1g) “insurance”	-0.41***	-0.29***	-0.46***	0

Note: each value represents the result of a separate bivariate regression

Statistical significance: *10%, **=5%, *** 1%

3.6. Summary

Overseas evidence suggests that financial pathways and outcomes are influenced by a range of personality and environmental variables. Having an external locus of control (a tendency to believe your life is outside of your control), having aspirations based on comparisons with others, or having poor self-control (a tendency to be impulsive) have all been found to be associated with spending rather than saving habits.

The LSS 2004 data on financial practices can arguably be used to approximate locus of control and self control. For the purposes of this study, therefore, families who live pay to pay most or all of the time are assumed to be “spenders” and have low self-control or be impulsive; whereas individuals who routinely save or save for goals most or all of the time are assumed to be “savers” and have internal locus of control. Families who purchase insurance are also assumed to have internal locus of control.

The variables “spender not saver” and “insurance” in particular have been shown to have a strong, but opposite effect on the likelihood of a family experiencing problem debt—the former effect being positive and the latter being negative.

4. The confounding effects of family and financial circumstances

There are a number of factors that could explain the likelihood of being over-indebted and therefore confound the impact financial behaviour has on over-indebtedness.

This section outlines a more realistic model of over-indebtedness, the theoretical and empirical basis for the additional variables, and the suitability of LSS 2004 data to approximate them.

4.1. Theory and evidence

This section also summarises the key findings in the Families Commission and Retirement Commissions’ report: *Beyond Reasonable Debt – A background report on the indebtedness of New Zealand families*.

The main finding was that it is difficult to isolate a single indicator of indebtedness or over-indebtedness. Of the studies that were reviewed, a number of empirical relationships were identified. It is important to note that the studies reviewed were based on different datasets (in time and place) as well as different definitions and types of debt (or problem debt). In some cases where empirical relationships were found, it was difficult to establish the extent to which confounding factors were controlled for. None of the studies are thus directly comparable and at best the study identified a number of hypotheses for testing with New Zealand data. Hence the current study.

Debt usage or participation in the debt market is strongly correlated with age in a number of overseas studies (Tudela & Young, 2004; Balmer et al, 2005; Kempson, 2002). That is, people are increasingly likely to borrow over the first half of their working life when they have fewer resources and more demands on those resources (due to the costs of creating and raising a family), and are decreasingly likely to borrow over the second half of their working life. The relationship between the amount of debt people take on and age, however, has not been clearly established in the literature (Livingstone & Lunt, 1992; Del-Río and Young, 2005). This age effect is presumably confounded by income and wealth – older people may be less likely to use debt when they are older, but may be able to finance much higher levels of debt when they do.

The impact that family size or the number of children has on indebtedness and over-indebtedness is also inconclusive, most likely also due to the confounding effects of income and wealth (Livingstone and Lunt, 1992; Lindqvist, 1981; Kempson et al, 2004; Valins, 2004). However, there is some evidence of a positive, causal correlation with relationship breakdown and over-indebtedness (Kempson et al, 2004; Balmer et al, 2005).

As expected, income has been found to be a strong indicator of the amount of debt people take on and of problem debt, but a poor indicator of debt usage or participation in the debt market (Livingstone & Lunt, 1992).

Having an optimistic view of one's future financial position and having higher qualifications has been associated with increased use of unsecured debt, but it is not clear whether the effects of income and borrowing for education have been adequately controlled for (Del-Río and Young, 2005).

Unemployment, benefits receipt and long-term illness or disability have all been found to be positively associated with over-indebtedness (Kempson, 2002; Balmer et al, 2005).

No overseas evidence linking ethnicity with indebtedness and/or over-indebtedness was found. Age, income and wealth are likely to be significant confounding factors as Maori and Pacific peoples in New Zealand have young age demographic structures compared to the general population (SNZ, 2009) and are disproportionately represented in low income (MSD, 2008) and net worth statistics (Cheung, 2004). It is possible, however, that ethnicity might indirectly influence indebtedness and/or over-indebtedness to the extent that culture influences financial behaviour (providing financial support to extended family, for example). There is some evidence that this might be worth exploring, but examining what influences behaviour is beyond the scope of this current research.

4.2. Extended model

Based on this evidence, the basic model outlined in equation (1) can more realistically be re-specified as follows:

$$\begin{aligned} \text{Prob(over-indebted)} = & \alpha + \beta_1 \text{ financial behaviour} \\ & + \beta_2 \text{ family characteristics} \\ & + \beta_3 \text{ financial circumstances} + \varepsilon. \end{aligned} \quad (2)$$

The slope coefficients (β s) represent the marginal or 'pure' (rather than potentially confounded) effect that each of these explanatory variables has on the likelihood of families being over-indebted. If financial behaviour does have a marginal effect on the likelihood of being over-indebted, the coefficient would be non-zero with a reasonable degree of significance. If the effect is not confounded by other factors such as family characteristics and financial circumstances, the coefficient β_1 estimated in (2) should be similar to the coefficient β estimated in (1).

4.3. Confounding variables in the Living Standards Survey 2004

Family characteristics

Variables on age, relationship status, recent break-up and number of children have been constructed from the LSS 2004. It is these underlying family characteristics, rather than any specific family type (such as sole parenthood) that the literature

suggests influence over-indebtedness.¹² These influences need to be removed in order to observe any pure effect financial behaviour has on over-indebtedness.

'Age' is a continuous variable and is the reported age of the respondent in the LSS 2004 dataset¹³, although an age of the family could be derived from the dataset in future analysis. 'Age²' is also included in the regression to reflect a possible quadratic (or 'lifecycle') relationship with financial strain. This relationship would have a "U" shape: young and old families are more likely to experience financial strain as respectively they are at the beginning and end of their working lives.

'Relationship status' is the reported social marital status of the respondent in the LSS 2004 dataset.¹⁴ This is a dummy variable with values 0 for singles and 1 for couples. Couple families are expected to be less likely to experience financial strain than single families, primarily due to access to resources. Therefore a negative relationship is expected between this variable and financial strain.

'Recent break-up' represents respondents who reported ever experiencing a break-up of a marriage or de facto relationship.¹⁵ This is also a dummy variable with values 0 for "no" and "1" for yes. As mentioned in earlier, relationship break-up was found to be positively and causally linked with problem debt in the UK.

'Number of children' is the count of children in the respondent's family group, reported as having any of the following relationships with the respondent (biological, step-child, adopted-biological, adopted-not biological, fostered, whangai).¹⁶ Having lots of children is expected to put pressure on a family's resources and is therefore expected to be positively related to financial strain. The earlier report¹⁷ acknowledged that family age, income and wealth are likely to confound any relationship number of children is likely to have with financial strain, hence mixed international evidence. A positive, but weak relationship is therefore expected with financial strain.

Financial circumstances

Qualification data arguably represent family characteristics and financial circumstances. After preliminary testing, two dummy variables have been created from the respondent's reported highest qualification in the LSS 2004 dataset:¹⁸ the first is 'any qualification' (0=none, 1=any); the second is any 'post school qualification' (0=none or school only, 1=higher than school). Both variables are expected to be negatively related to financial strain, but positively related to family income.

¹² This is a similar rationale for not including ethnicity in the analysis. See note 25.

¹³ Q10_a1, LSS 2004 Questionnaire.

¹⁴ Q4 a2 – a10 LSS 2004 Questionnaire = "spouse or partner", for adults in the respondent's family group.

¹⁵ Q69 LSS 2004 Questionnaire = "once" or "more than once") and reported that break up occurring less than a year ago (Q70).

¹⁶ Q4 c1 – c10, LSS 2004 Questionnaire.

¹⁷ Beyond Reasonable Debt, Ibid.

¹⁸ Q19, LSS 2004 Questionnaire. The highest family qualification has not been derived, but could be with future analysis.

'Family net income' is derived from reported responses to the LSS 2004 question:¹⁹ "what is your best estimate of (a) your personal total income (for the past 12 months), and (b) your partner's total income (for the past 12 months)?" The responses were coded into income bands provided in the survey questionnaire, along with information on whether they refer to before or after tax amounts. These data were converted to midpoints (using an estimate for the upper band) and net tax figures were produced.²⁰ The result was a continuous variable based on midpoint data. The variable has also been divided by 1000 dollars to make the marginal effect more obvious. A strong, negative association is expected with financial strain, as per the earlier discussion.

It is worth noting that the income distribution generated by this variable suggests that 50% of families have net incomes less than \$16,250. As expected, low income families are also disproportionately represented by single families (with one income earner) and high income families by couple families (with up to two income earners). It is possible that there is some under-reporting of income, and that income is systematically being under-reported by single families. Despite the apparent wording in survey questionnaire to the contrary, it is plausible that low income families are not fully reporting (or possibly accessing) social assistance entitlements or tax credits. Establishing whether this is or is not the case is outside the scope of this research, but does need to be considered as a potential data bias. The implication of such a bias is that the relationship between EFU income and financial strain could be over-estimated.²¹

A dummy variable is also derived for 'benefit receipt', which captures any benefit received by the respondent²² or partner²³ in the last 12 months (0=none, 1=any). To some extent this should remove any possible bias caused by any systematic under-reporting of income by low income families. A positive relationship with financial strain is expected with this variable.

Finally, 'net debt' is derived from the total reported debt of the family less the total reported assets of the family. Family assets comprise the latest government or rating valuation of property²⁴ and the total value of current savings and investments²⁵. Family liabilities comprise the total outstanding and unpaid debt owed for hire-purchases, credit cards, overdue fines, overdue bills and overpaid benefits²⁶, the

¹⁹ Q109, LSS 2004 Questionnaire.

²⁰ Tax rates (incl ACC levy): up to 38,000 = 19.5 (20.9); 38,001 - 60,000 = 33 (34.4); 60,001 = 39 (40.4).

²¹ Another consideration with using EFU income, mentioned in Section 2.1, is that family income (and assets) may be a poor predictor of financial strain if families in financial strain are more or less likely to live in multi-EFU households. One might expect an economic model to over-estimate the relationship between income and financial strain if families in financial strain are more likely to live in multi-EFU households, as the data will under-state access to resources and consumption sharing (or economies of scale). On the other hand, "financial strain" may in fact be capturing this resource-sharing between EFUs.

²² Q110, LSS 2004 Questionnaire.

²³ Q111, LSS 2004 Questionnaire.

²⁴ Q127, LSS 2004 Questionnaire.

²⁵ Q137, LSS 2004 Questionnaire.

²⁶ Q151, LSS 2004 Questionnaire.

amount currently owing on student loans²⁷, and the total debt owed on accommodation²⁸. According to the data, 30% of families have 'net debt'.²⁹

The result is a continuous variable based on midpoints, similar to that derived for family or EFU net income. As with income, this variable has been divided by 10,000 dollars to more easily interpret any marginal effect. A strong negative relationship is expected with financial strain. However, net debt could also represent illiquid resources, so it is conceivable that a family with low net debt could still experience financial strain in the short term.

4.4. Estimation

The extended model, based on the variables selected from the LSS 2004 dataset, can be re-specified as follows:

$$\begin{aligned} \text{Ln}(\text{problem debt}) = & \alpha + \beta_1 \text{ age} + \beta_2 \text{ age}^2 + \beta_3 \text{ relationship status} \\ & + \beta_4 \text{ recent break-up} + \beta_5 \text{ number of children} \\ & + \beta_6 \text{ family net income} + \beta_7 \text{ net debt} \\ & + \beta_8 \text{ insured} + \beta_9 \text{ "spender not saver"} + \varepsilon. \end{aligned} \quad (2a)$$

As discussed with the basic model, finding a statistically significant relationship between any of the explanatory variables and problem debt does not automatically suggest a causal relationship. The theory and the data provide the strongest basis for asserting a causal relationship. The explanatory variables in this model are mostly determined prior to or concurrently with the reported experience of financial strain, which had to be in the last 12 months, so a weak causal relationship is assumed with a significant result.

It should also be noted that the sample data used in the regressions are un-weighted; and that "don't know" or "refused" responses were omitted from the regression analysis. The regressions were therefore run with reduced sample sizes, varying according to which variables were included in the regressions.

As with the basic model, the extended model being estimated is effectively a logit model, as the dependent variable (problem debt) is a binary or dummy variable with values 0 and 1. In other words, the problem that the models are trying to solve is the probability or likelihood that a family experiences problem debt – ie that a family gets a value of 1.

4.5. Results

²⁷ Q141, LSS 2004 Questionnaire.

²⁸ Q130, LSS 2004 Questionnaire. Note that total debt figures do not capture overdrafts, due to the specific wording in the LSS 2004 questionnaire. See note 3, above.

²⁹ This proportion seems high, but may be due to the computation of EFU rather than household or individual net debt. In fact, this seems more plausible in relation to reporting of debt and assets than in relation to income. Young single families are arguably more likely to incur debt on the basis of anticipated future earnings (eg Student Loans) or an implicit/explicit guarantee provided by older family members, particularly in multi-EFU households. It should also be noted that the measure does not capture household items.

Figure 7 shows the results of three sets of multivariate regressions against the three different definitions of problem debt. What is clear is that the behavioural variable “spender not saver” consistently emerges as having the strongest marginal effect. The marginal effect of this variable ranges between 0.13 and 0.23. This means that being a “spender not saver” (ie having low self control and external locus of control) increases the likelihood of a family experiencing problem debt (however it is defined) by between 13 and 23%, controlling for other variables. This is a significant finding.

The presence of other variables only appear to halve (rather than remove) the marginal effect of the “spender not saver” variable. Figure 6 indicated that regressing this variable on its own appears to account for up to 42% of the likelihood of experiencing financial strain.

The effect of insurance on the likelihood of experiencing problem debt on the other hand is significantly reduced when other explanatory factors are accounted for.

Figure 7: Marginal effects of explanatory variables in multivariate regressions (n=3607)

Explanatory variable	Problem debt definition 1 (observations at one=963)	Problem debt definition 2 (observations at one=849)	Problem debt definition 3 (observations at one=604)	Case values:
age	0.00	0.01***	-0.00	46.5
+ age ²	-0.00**	-0.00***	-0.00**	2444.4
+ relationship status	-0.06***	-0.04***	-0.03***	1 (0=single, 1=couple)
+ recent break-up	0.03	0.03	-0.00	0 (0=none, 1=yes)
+ number of children	0.05***	0.03***	0.02***	0.8
+ any qualification	-0.05**	-0.03*	-0.04***	1 (0=none, 1=any)
+ post school qualification	0.02**	0.02	0.01	1 (0=none or school, 1=post school)
+ family net income / 1,000	-0.00***	-0.00**	-0.00***	\$34.66
+ benefit receipt	0.04***	0.03***	0.02***	1 (0=none, 1=any)
+ net debt / 10,000	0.00***	0.00***	NA	-\$18.13
+ insured	-0.07***	-0.00	-0.08***	1 (1=yes, 0=no)
+ “spender not saver”	0.23***	0.21***	0.13***	0 (1=yes, 0=no)

Note: each column represents the result of a separate multi-variate regression
Statistical significance: *10%, **=5%, *** 1%

4.6. Summary

Even after controlling for a range of variables that might also explain problem debt, the behavioural variable “spender not spender” emerges as having a strong independent effect, irrespective of the definition of problem debt.

5. Implications for policy

It is clear from the results that financial behaviour is important and does have an important role to play in determining whether families experience financial strain. Being a “spender not saver”, in particular, consistently emerged as the strongest variable in the regressions carried out. In terms of underlying behaviours, this result suggests that having external locus of control (ie believing things are outside of your control) and low self-control (ie tending to be impulsive) increase the likelihood of a family experiencing financial strain by more than 20%.

This finding offers support for existing policy measures to encourage saving habits. The Retirement Commission already provides and promotes financial education and information programmes to help people make informed financial decisions throughout their lives. Arguably there is a need for more emphasis on *how* families save and learn to save rather than what they save for. A recent overseas study suggests for instance that debt literacy is low and is linked with financial strain (Lusardi, Keller & Keller, 2009). There may be some scope to test the link between debt literacy and financial behaviour with the results of the 2009 Financial Knowledge Survey.

Another overseas study has also demonstrated that social marketing approaches that are responsive to employees’ financial knowledge and behaviours are successful (Lusardi & Tufano, 2008). One of those behaviours identified was impulse or self control. There is a growing body of literature that suggests regulation or compulsory saving programmes (like KiwiSaver) can help raise the opportunity costs associated with impulsive spending for some individuals (for example Beshares, Choi, Laibson & Madrian, 2005). Simply improving awareness amongst families that there are opportunity costs, however, seems an obvious place to start; rather than imposing compulsory schemes that may in fact have negative consequences for individuals or families who do not have the requisite behaviour.

6. Conclusions

Multivariate analysis of data from the Ministry of Social Development’s Survey of Living Standards 2004 has shown that financial behaviour does affect the likelihood of being over-indebted, other things being equal. The financial behaviour in question is that families “live pay to pay” “all” or “most” of the time and do not regularly save a portion of their income or save for goals “all” or “most” of the time.

Given this finding, a sensible policy response is to ensure families are aware of the wider benefits of saving or opportunities costs of impulsive spending. To go beyond this, more information about how families acquire and apply their financial knowledge is needed.

The finding in this study, however, should be further tested for robustness. Results from the 2009 Knowledge Survey provide an immediate opportunity for doing this. A number of issues with the underlying LSS 2004 data were identified that could be examined further. There is also a considerable amount of additional information in this dataset that may shed light on the origins or differences in financial behaviour between families. Although the survey data are becoming dated, they are still relevant in exploring relationships between variables.

The following diagram summarises what this research has found, and the questions that remain. This diagram shows that 25% (1177) of all families sampled experienced some form of financial strain in the previous 12 months. Most of those families (1029)

were using mainstream credit and around two thirds (752) were in a negative equity situation at the time of interview.

By contrast, less than half of the 75% (3477) of families who experienced no financial strain were using mainstream credit (2211) and just over one fifth (795) were in a negative equity situation.

Irrespective of how the outcome group of families is defined, the diagram shows that the marginal effect of behaviour is still strong. The effects of ethnicity or culture, the early learning environment and financial literacy on behaviour are worth exploring further.

	<i>Problem debt definition 1</i>	<i>Problem debt definition 2</i>	<i>Problem debt definition 3</i>
	All families 4654 100% of EFUs	Families using mainstream credit 3240 70% of EFUs	Families in negative equity (ie owe more than own) 1547 33% of EFUs
Financial strain	1177 25% of EFUs	1029 22% of EFUs 32% of families using credit 87% of families in strain	752 16% of EFUs 49% of families using credit 64% of families in strain
No financial strain	3477 75% of EFUs	2211 47% of EFUs 68% of families using credit 64% of families in strain	795 17% of EFUs 51% of families using credit 23% of families in strain
	↑↑	↑↑	↑↑
Marginal effect of behaviour	23%	20%	21%
Further effects to explore: what effects behaviour?	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"> Ethnicity / culture? Gender? Early learning? Financial literacy / knowledge? </div>		

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