

# **Problem debt, over-indebtedness, and Buy Now Pay Later: The case of young adults in New Zealand**

Aaron Gilbert\*

Auckland University of Technology

Ayesha Scott^

Auckland University of Technology

## **ABSTRACT**

Consumer finance laws seek to protect borrowers from unaffordable credit by placing the onus on lenders to ensure affordability criteria are met at initial approval. Therefore, people who become over-indebted have typically experienced a change in financial circumstances, such as unemployment or similar income shock. Buy Now Pay Later (BNPL) schemes, which continue to grow in popularity, are not captured by consumer finance law allowing providers to lend to applicants with few external restrictions. The lack of affordability criteria raises the possibility that unwise BNPL use could allow users to borrow their way into over-indebtedness. For young adults, who are already at greater risk of problem debt due to low and volatile incomes, this is particularly problematic. We add to the very limited literature on the impact BNPL has on financial wellbeing by investigating the relationship between BNPL use and over-indebtedness in a sample of 705 New Zealand young adults, aged 18-34. We find strong evidence that indicators of over-indebtedness are more prevalent in those who use BNPL, and especially those who use it poorly, i.e., incurring fees frequently and needing to borrow to repay their BNPL balance. The results suggest there are good reasons for governments to extend existing consumer finance regulations to BNPL.

**Keywords:** consumer debt; problem debt; over-indebtedness; buy now pay later; young adults

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\**Corresponding Author:* Department of Finance, AUT Business School, Auckland University of Technology, Private Bag 92006, 1142 Auckland, New Zealand. Phone: +64 9 921 9999 ext 5713. Email: [agilbert@aut.ac.nz](mailto:agilbert@aut.ac.nz)

^Department of Finance, AUT Business School, Auckland University of Technology, Private Bag 92006, 1142 Auckland, New Zealand. Phone: +64 9 921 9999 ext 5716. Email: [ayesha.scott@aut.ac.nz](mailto:ayesha.scott@aut.ac.nz)

## 1. Introduction

Buy Now Pay Later (BNPL) is a recently developed credit product, whereby a consumer purchases a product and pays it off in 4-6 equal instalments. Since its introduction, it has experienced extremely rapid growth. In 2021, BNPL transactions were estimated to be 2.9% of global e-commerce, more than USD\$100 billion (Worldpay, 2022), with use concentrated in only a few countries and regions. It is expected to continue greater than double-digit annual growth into 2030. BNPL is also being used increasingly widely, for example, in 2019 it was estimated that 30% of the Australian population had an active BNPL account (ASIC, 2020). However, in many countries, BNPL is not captured under existing consumer finance laws. In New Zealand, the prevailing law (Credit Contracts and Consumer Finance Act 2003 and Fair Trading Act 1986, see MBIE [2021]) does not apply to consumer finance that is due within two months and where the debt equals the value of the sale price of the products, i.e., there is no interest cost (at time of purchase). As most BNPL providers offer finance for less than two months, under New Zealand law BNPL is technically not ‘consumer finance’ or ‘debt’. BNPL providers are therefore not required to assess the suitability and affordability of lending, the criteria imposed on consumer finance providers to prevent borrowers taking on unaffordable debt and becoming over-indebted.

Over-indebtedness can be understood as a situation where a borrower or household cannot meet its financial commitments, including necessary expenses, with existing and expected resources, without lowering its standard of living below an acceptable standard (D’Alessio and Lezzi, 2013). Disney, Bridges and Gathergood (2008) summarises a number of ways in which households can become over-indebted, including financial imprudence (including both over-borrowing and under-insuring), income shocks as a result of job losses, health issues, and relationship breakdowns, and macro-economic shocks such as increasing interest rates or cost of living. Problem debt and over-indebtedness has serious and wide-reaching wellbeing consequences including financial exclusion (Russell, Maître and Donnelly, 2011), food choices (Goode, 2012) and health problems (Turunen and Hiilamo, 2014). Consumer finance law requirements to assess debt affordability and borrower suitability is designed to limit consumers from becoming over-indebted, especially by over-borrowing, and therefore limit the impact of macro-economic shocks. As BNPL providers are not required to ensure borrowers are not already at their borrowing capacity or even that they are not already in arrears, they circumvent existing consumer protections.

Offsetting the risk of BNPL being unregulated is the fact BNPL debts are usually for relatively short periods of time, and predominantly limited to small amounts. For example, one of the leading

providers of BNPL in Australasia, Afterpay, requires an upfront payment of 25% of the purchase price followed by three fortnightly payments over the following six weeks. Afterpay users are limited to \$1500 per transaction and a total of \$2000. Additionally, the initial credit limit starts lower and only increases as the borrower builds a track record of repayment. BNPL schemes are user-friendly, convenient, and if used wisely by consumers can be a low-cost and accessible form of credit. Australian data reports 1 in 5 BNPL users miss payments (ASIC, 2020). If users miss repayments, they incur late fees (e.g., Afterpay charges an initial \$10 late fee, then a further \$7 if not paid within 7 days, capped at \$10 for purchases below \$40 or 25% of the purchase value, up to \$68). Our understanding of consumers' attitudes toward BNPL as debt is limited and given a sizeable proportion of users are missing their repayments and thus may be using the product unwisely, exploring the relationship between BNPL use and over-indebtedness is an important and timely question.

Some consumer groups are more vulnerable to over-indebtedness. Anecdotal evidence suggests BNPL debt causes harm for low-income individuals or those unable to access safer credit (Good Shepherd NZ, 23 June 2021). The literature identifies young adults are particularly at risk (Legge & Heynes, 2009), due to a combination of factors including low incomes (life-cycle theories predict young adults at the start of their careers typically start on low incomes which rapidly increase), unstable incomes (especially for those undertaking part-time work while studying), and low financial literacy and experience (OECD, 2020). Limited research done on the use of BNPL shows that lower financial literacy results in higher BNPL use (Gerrans, Baur & Lavagna-Slater, 2021). Young adults are also the largest users of BNPL schemes, making up 60% of BNPL users in Australia (ASIC, 2020), and as BNPL is interest free, it is not clear young adults see it as credit and therefore may underestimate the consequences (Jones, 6 Jan 2022). The combination of low financial resources and poor financial literacy suggests BNPL use is particularly fraught for young adults, especially without the regulatory protections required for almost all other forms of consumer finance.

In this paper, we add to the emerging literature on Buy Now Pay Later by examining the impact that this form of credit has on over-indebtedness for young adults. We use an online Qualtrics panel to collect a non-probabilistic sample of 705 18-34 year olds in New Zealand, that is broadly representative of New Zealand's ethnic composition.<sup>1</sup> The survey asks a range of questions covering demographic information, economic and family circumstances, debt use, questions related to over-indebtedness, along with measuring financial capability, debt literacy and behavioural attributes identified in prior literature as influencing over-indebtedness, such as impulsivity and materialism. We also ask a range

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<sup>1</sup> Females are slightly over-represented in the sample, 55.7% compared to male 43.3%.

of detailed questions regarding respondents' experience and use of BNPL. To examine whether using BNPL and/or how BNPL is used results in respondents showing more indicators of over-indebtedness, we use univariate testing, ordered logistic regressions and latent class analysis.

Our results provide strong evidence that BNPL is associated with higher over-indebtedness in young adults. We observe those who use BNPL more frequently and those who display poor use of BNPL, i.e., incurring late fees, incurring fees more often, incurring fees due to being unable to repay their BNPL, and using debt to repay their BNPL, are associated with respondents having more indicators of over-indebtedness. These results hold in regression analysis when we control for demographic and economic factors, financial knowledge and behavioural factors, and other debt use. We then conduct latent class analysis to find clusters within the way respondents use BNPL and their attitudes towards it. We find three clusters: around 60% of users are using BNPL wisely, around 18% appear to be inexperienced and as a result make some mistakes, and around 16% of users do so poorly. As expected, we find the inexperienced and poor users of BNPL are associated with higher over-indebtedness than the savvy users.

Our study fills a crucial gap in our understanding of how young adults use newer forms of debt and contributes to our understanding of Buy Now Pay Later use by consumers. The newness of BNPL has meant that there are currently few studies into how BNPL is being used and its impact on users. Di Maggio et al. (2022) finds that BNPL encourages greater retail spending and that it increases weekly spending among BNPL users. They also note that BNPL users tended to have lower incomes than credit card users. Fook et al. (2022) also finds that BNPL users were more likely to engage in impulse buying and as a result over-consume on fashion items. Gutterman-Kenny et al (2022) find concerning signs in UK BNPL users especially in relation to using credit cards to repay their BNPL. They also find that BNPL is more common among young adults and in geographic areas associated with lower incomes. Gerrans et al. (2022) conclude that lower financial literacy is associated with greater perceived benefits and lower risks associated with BNPL use. Finally, Lux and Epps (2022) argue that for regulators, the challenge is to ensure that the convenient and accessible nature of BNPL credit is retained for those who use it wisely while helping those more likely to use it poorly mitigate their risk of becoming over-indebted. They recommend a number of suggestions including greater disclosure of costs and mandating reporting of BNPL to credit reporting agencies as potential options.

## **2. Methodology**

To investigate the impact that Buy Now Pay Later (BNPL) use has on over-indebtedness, we conduct a survey using an online Qualtrics panel of 705 New Zealand young adults aged between 18 and 34.

The non-probabilistic sample is broadly representative of the ethnic makeup of New Zealand although the final sample is overweighted with regards to female respondents. The survey asked for demographic information, financial and living circumstances, respondents' use of debt, detailed questions on a respondent's use of BNPL, respondents' financial knowledge and financial behaviours, and personal traits that may influence their financial behaviours. Finally, we include questions to generate a measure of over-indebtedness based on the work of Davydoff et al. (2008).

The Davydoff et al.'s (2008) measure includes five over-indebtedness indicators, based on factors commonly argued as indicating over-indebtedness. Of the five, four are objective and the last is subjective. The four objective measures are: (1) whether debt repayments are greater than 30% of income, (2) whether unsecured debt repayments are greater than 15% of income, (3) whether income is below the poverty line which is defined as the median income (currently \$3,942.19 per month in New Zealand), and (4) whether respondents have more than three credit commitments.<sup>2</sup> Each indicates if an individual has the capability to cover their debt repayments. Having debt repayments that are too great in comparison to income leaves little remaining for ordinary expenses like food, while the likelihood of failure to repay debts has been strongly linked to the number of individual debt commitments a person or household has. To calculate these measures, we asked respondents to tell us what types of debt they have from a comprehensive list of 11 categories. For each type of debt, we ask how many different credit contracts they have (i.e., they might have two credit cards which we count as two credit contracts) and finally, how much they repaid on each type of debt in the last month. We pair this information with their reported monthly income. The fifth and final indicator is subjective, asking whether the respondent's debt repayments are a heavy burden, using a five-point Likert scale where a higher score indicates a heavier burden. We sum the number of indicators for each respondent and use this as our estimate of over-indebtedness. Respondents scoring a four or five are classed as over-indebted.

The survey data is also used to estimate a range of measures prior literature shows impacts financial behaviours and debt use. We estimate financial capability using Xiao and O'Neill's (2018) model, estimating four components: *objective financial literacy* measured as the sum of correct responses to six questions covering interest, inflation, time value of money, bonds, mortgages and stocks; *subjective financial literacy* which measures self-assessed financial knowledge based on a seven-point scale; *financial behaviours* measured as the sum of respondents who said they spent

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<sup>2</sup> Davydoff et al. (2008) uses 50%, 30% and 4 or more credit commitments. Later studies have argued these are too high and have subsequently lowered the thresholds. We use the same thresholds as D'Alessio and Lezzi (2013) although testing of the original threshold produces similar results.

within income, budget, save, and have planned for retirement; and *perceived financial capability* based on a question asking whether respondents saw themselves as good at dealing with money, also measured on a seven-point scale. We standardise each section such that it ranges between zero and five and sum across the four components to give a financial capability score between zero and 20. For debt literacy, we follow Schicks (2014) and use the sum of correct responses to three questions on different aspects of debt.

We also assess respondents' money management skills and attitudes to debt. Money management is self-assessed based on nine items following Garðarsdóttir and Dittmar (2012). Each item is assessed on a five-point Likert scale from strongly disagree to strongly agree which is then aggregated to compute the final score, with a higher score denoting stronger money management. *Debt attitudes* is based on Białowolski et al. (2020), who develop a seven-item measure drawn from previous literature, assessing people's debt tolerance and aversion to debt. Each item was measured on a five-point Likert scale from strongly disagree to strongly agree, and scores for the final two items, which relate to aversion to debt, are reversed to be consistent with the debt tolerance items. We average the respondents' scores across all seven items and use this as a score of their debt attitudes, with higher scores having a more favourable attitude to debt.

We measure three behavioural factors that have been linked in the literature to debt use and over-indebtedness. The first is materialism, which is defined as the importance placed on ownership and acquisition of goods (Richins and Dawson, 1992). More materialistic consumers would be expected to consume more, and therefore are more prone to debt use. We estimate a short form of the Material Values Scale developed by Richins and Dawson (1992) presented in Richins (2004), that uses six items. Each item is scored on a five-point scale such that a higher score indicates higher materialism. We average the score across the six items. Our second behavioural factor is a measure of impulsiveness or lack of self-control. Impulsiveness has been linked to excess levels of debt and lower tolerance for delayed gratification (Vohs and Faber, 2007; Gathergood, 2012). We employ Gathergood's (2012) impulsiveness measure, a single question asking people to rate of a five-point scale from strongly disagree to strongly agree the following statement "I am impulsive and tend to buy things even when I can't really afford them". The final behavioural factor is present orientation, which measures a respondent's preference for present consumption. Those with a greater present orientation are more likely to use debt. We again use the measure from Gathergood (2012), a single five-point scale which measure responses to the statement "I am prepared to spend now and let the future take care of itself".

## 2.1 Summary statistics: Over-indebtedness

Table 1 displays how over-indebtedness (OID) and BNPL use differs based on demographics and debt use. The first column presents the average OID score (out of 5), measured as the number of over-indebtedness indicators shown by a respondent. On average, we observe respondents have 2.07 indicators of over-indebtedness. We observe some interesting demographic differences. Men have slightly higher OID scores, while Indian respondents had considerably higher than average OID. In contrast, Asian and European respondents had low OID scores. Self-employed respondents also had very low OID, over half a point lower than average, while those unemployed and looking for work had much higher OID. This is unsurprising as becoming unemployed is a key external trigger for a person becoming over-indebted. Dependents also have a significant impact on OID, with one dependent increasing the average OID by nearly half a point.

Interestingly, those with their own home without a mortgage and those living rent-free show higher than average OID. Given mortgage/rent is often one of the largest expenses a person will have, one would assume the absence of these expenses would leave a person in a stronger financial position. Respondents living rent-free are perhaps younger and living at home, with their higher OID average likely driven by low income. For those with a mortgage, secured debt repayments for 18-34 year olds are likely to be very high given New Zealand house prices relative to incomes. Income as expected has a negative relationship with OID. Debt use, of almost any type, also increases OID. The increase in OID, however, is particularly acute for debts commonly considered to be ‘bad’; personal loans, overdrafts, hire purchases, mobile and other fixed term contracts, and non-bank loans. All represent borrowing for depreciating assets and tend to be high cost. In contrast, those with student loans<sup>3</sup> have an OID below average.

## 2.2 Summary Statistics: Buy Now Pay Later

Table 1’s second column presents the demographic breakdown for those who have used BNPL. We observe over 70% of young adults have used BNPL, with over 86.5% of those being repeat users. Respondents most likely to have used BNPL are women (+6%), 24-29 years old, Māori, Indian or Pākehā (NZ European) respondents, those who are not currently looking for work, those with their own home without a mortgage, have one dependent, and have above average incomes (quartiles 3 and 4). Additionally, they have more debts (+1.16 debts) but lower debt repayments, and are likely to have personal loans, overdrafts, a car loan, or mobile phone contracts. Column 7, those who use BNPL

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<sup>3</sup> In New Zealand, tertiary students can borrow interest-free to study (referred to as a ‘student loan’), with the repayments beginning when taxable income reaches \$21,268 per year.

constantly, provides similar demographic results. We again see that women (+1%), Indian or Pākehā, those who are not looking for work, and those with the highest income are most likely to use BNPL constantly. In contrast with BNPL use, it is older respondents who use it constantly, specifically 30-32 year olds, along with those living rent-free and those who have five or more dependents. Those using it constantly had the highest average number of debts at 5.41, and the second highest debt repayments after those who had used it only once. In terms of debt types, those using BNPL constantly are more likely to have personal loans, mobile and fixed term contracts, non-bank debt, and overdrafts.

Those who have incurred BNPL fees (Column 8) are more likely to be men (+1.6%), between 21 and 29 years old, Māori or Pasifika, looking for work, living in either a rental or rent-free, have 4 dependents and have the lowest income. They also tend to have more debts on average (+1.45) and around 50% higher debt repayments than those not incurring fees. Again, we see high instances of 'bad' debt types for those who incur fees, particularly personal loans, overdrafts and hire purchases. There are demographic similarities between those who incur fees and those incurring them more than three times (Column 12). Respondents 30-32 years old, those in rented accommodation, and those with four dependents are both more likely to have fees and to incur them more than three times. In contrast, women are more likely to incur fees more often (+6.4%) along with Europeans or Asians, those not looking for work, and those in the middle two quartiles based on income. In terms of debt use, those incurring fees more than three times have nearly 6 debts on average, the second highest after those who have incurred fees three times, but with debt repayments are lower than those incurring fees less often. The most common types of debts for respondents incurring fees 3+ times are fixed term contracts, personal loans, non-bank debt, and overdrafts which largely overlap with those who incur fees, and student loans which doesn't.

Those using debt to repay their BNPL are more likely to be men (+28.9%), 33-34 years old, Indian, studying part-time or looking for work, surprisingly own their house without a mortgage, have 4 or more dependents and, also surprisingly, have an income in the highest quartile. They also have more debts (+1.28) and are repaying over three times more per month on their debts. In terms of debt types, they are most likely to have hire purchases, personal loans, and fixed term contracts. Finally, we consider those who incurred fees as they lacked the funds to repay their BNPL. There was no real gender difference, both around 41.5%, but were most likely to be the youngest users, European or Indian, self-employed, or studying full time, in any housing situation other than their own home without a mortgage, have four dependents, and the lowest income. This suggests that low or unstable incomes has a high correlation with lacking the funds to repay BNPL. With regards to debt, those lacking funds had a higher average number of debts, 4.85, but lower repayments than those who simply



forgot. Those with fixed term contract, nonbank debt and hire purchases were most likely to lack the funds.

### **2.3 Buy Now Pay Later use, financial capability, and behavioural factors**

Table 2 presents the univariate differences in BNPL use according to financial knowledge and behavioural aspects included in our survey. We observe BNPL use and frequency of use, depend more on behavioural factors than financial knowledge. Financial capability, debt literacy, money management skills are broadly similar between those who have and have not used BNPL and between those who use it once compared with constant users. The behavioural factors are generally consistent with our prior expectations. Those who are more materialistic, have a greater tolerance for debt, are more impulsive and less mindful of the future are all more likely to use BNPL and use it more frequently, although debt attitude only affects frequency of use rather than experience with BNPL.

In contrast to likelihood of using BNPL, financial capability does impact how wisely people use the scheme, albeit not always in the direction we would expect. We observe clear evidence that those with higher debt literacy and money management skills use BNPL better with less likelihood of using debt to repay BNPL, lower incidence of incurring fees and are more likely to have simply forgotten their repayment than being unable to pay. However, neither debt literacy nor money management impacts on frequency of fees. Financial capability presents comparable results for fees, fees frequency, and the reason for incurring fees, but we find that those people with higher financial capability are more likely to use debt to repay BNPL. While on the face of it this may seem counter-intuitive, it may indicate an increased awareness of avoiding fees. Again, our behavioural factors present the expected story. Those who are more materialistic, are more impulsive, and more heavily discount future cashflows are more likely to use debt to repay their BNPL and incur fees. However, there is less consistency with regards to the reason for incurring fees with only small differences for all except present orientation. Debt tolerance (debt attitudes) shows no difference for incurring fees, but those who are less debt tolerant are less likely to frequently incur fees.

## **3. Empirical Results**

### **3.1 Is Buy Now Pay Later use related to over-indebtedness?**

To explore the relationship between BNPL and over-indebtedness, we examine univariate differences in our over-indebtedness measures and various aspects of BNPL use. Table 3 presents a breakdown of respondents based on the number of over-indebtedness indicators they have, and the mean over-indebtedness score based on BNPL use. The results show that BNPL use and more frequent BNPL use is associated with greater over-indebtedness, nearly 0.25 higher for those who have used the scheme

versus those who haven't. Constant users are nearly 0.75 higher than those who have tried it once. When we consider how wisely BNPL is being used, we see evidence that those using BNPL poorly are more likely to be over-indebted. Those who use debt to repay BNPL and those incurring fees have an OID score nearly 0.9 higher than those who don't. We also see a very steep increase in the OID score between those incurring fees once and those incurring them twice, and again between those incurring fees twice and those incurring them more often. Those incurring fees 3+ times have an average score almost one whole point higher than those incurring fees only once. Considering the mean OID score for those who have incurred fees once is 2.23, this is nearly a 50% increase. Finally, we also find that those incurring fees because they are unable to pay have an OID score nearly 0.5 higher than those who reported they forgot their repayment.

To control for demographic, knowledge and behavioural differences that might impact the relationship between BNPL and over-indebtedness, we use ordered logistic regression as our dependent variable, OID, is ordinal (Table 4). Given we observe that having other types of debt is also highly associated with both using BNPL and higher OID scores, we include dummy variables for each of the debt types. Controlling for use of other debt allows us to more definitively identify that it is BNPL causing increases in over-indebtedness for young adults. Unlike the univariate analysis, the results here are more favourable for BNPL use; after controlling for demographic, financial capability, and behavioural factors, we find using BNPL is not associated with a significant increase in over-indebtedness. Rather, we find that looking for work, being more impulsive, and having personal loans, credit cards, overdrafts, mobile and other fixed term contracts, more current credit contracts, and greater debt repayments are all associated with higher over-indebtedness. Income, unsurprisingly, has the opposite effect, with higher income reducing over indebtedness.

While we don't find that using BNPL increases over-indebtedness, we do find that using it more often does (Column 2, Table 4). Each increase in BNPL frequency increases OID by 0.27, or put differently, going from using it once to constantly is associated with a more than a one-point increase in OID score. Again, given the average OID score is around 2, this is a 50% increase in OID score for constant BNPL users. Interestingly, using debt to repay BNPL, like use of BNPL, is also insignificant once we control other factors (Column 3, Table 4). Incurring fees is associated with an increase in OID by nearly 0.6, suggesting that, after controlling for other factors, poor management of BNPL increases over-indebtedness scores. We also see some changes in significant control variables. Specifically, Māori, Pakeha and European respondents had lower OID scores once we include fees, while the various debt types are no longer significantly associated with higher OID scores. Only having a fixed term contract remains significant. When we consider the frequency of fees and the reasons for incurring

fees, we see both also result in higher OID after controlling for other factors – in line with the univariate results. Each increase in fees frequency, i.e., going from incurring fees once to twice, results in a 0.4 increase in OID. This means a respondent going from incurring fees once to more than three times will see their OID increase by around 1.2 points. Forgetting to pay and being unable to pay are both responsible for OID scores that are over 1.5 points higher.

It is worth noting that the samples for the last two columns are much smaller as they are restricted to those respondents who incurred fees,  $N = 192$ . This impacts the control variables; for instance, Māori respondents have a negative coefficient for OID score, as does financial capability when examining the reason for incurring fees (Column 6, Table 4). We also observe significant positive relationships for those living rent-free and higher money management, both of which appear to be counter intuitive. We would expect that living rent free and being better with money would reduce over-indebtedness. Impulsivity and fixed term contracts also cease to be significant.

Table 5 presents the average marginal effect for the ordered logistic regressions. The marginal effect presents the difference in the percentage of respondents based on the number of OID indicators they have. When we consider BNPL use we again observe no statistical difference in respondents' over-indebtedness scores. Interestingly, for frequency of use we find it is only extremely large use that has a consistent impact on OID score, and the impact is considerable. There are 10% less respondents who constantly use BNPL that have no OID indicators, 11.9% less that have only one, and between 5.7% and 7.6% more respondents who had scores of 3 or more. However, moderate or even monthly use of BNPL does not appear to increase the likelihood of a respondent having a higher OID score.

In terms of how wisely BNPL is used we again find no difference in the distribution of OID scores between those who use debt to repay their BNPL and those who don't. However, we see between 4% and 4.8% fewer respondents with OID scores of zero or one have incurred fees, and between 1% and 3.1% more respondents with scores of two or more. As with the frequency of use, it is between those who incur fees most often and those only incurring them once that we see significant differences in the percentage for each OID score. In particular, we see there were 9.5% fewer respondents who have incurred fees more than three times with a score of one, and 9.6% more who had the maximum over-indebtedness score of five. We obtain similar magnitudes for the fees' cause, with both those who had forgotten to pay and those who were unable to pay having significantly fewer respondents with low scores and significantly more with high scores.

Finally, we conduct additional analysis using matched samples to adjust for differences in sample composition between treated and control groups. Specifically, we use propensity score

matching to compare the effect of BNPL use on OID score by comparing a BNPL user with the closest non-BNPL user based on our demographic, financial knowledge and behavioural factors. Appendix 1 presents the balance summary and density plot, showing there are strong pre-match differences between the treated and control groups. However, once we match based on propensity scores these differences are greatly reduced and as shown by the plot, the treatment and control groups display nearly identical densities. This indicates our matching is successful and any observed differences in over-indebtedness is not driven by sample differences. As we require the variable of interest to be binary for propensity score matching (PSM), we cannot consider the frequency of use nor the frequency of fees. Table 6 presents the average treatment effect and the average treatment effect on the treated group. Interestingly, while BNPL use remains insignificant and fees remains strongly significant, using debt to repay BNPL is significant when we use PSM in contrast to the previous regressions. Conversely, the reasons for incurring fees (forgot to pay and unable to pay) are both insignificant based on PSM.

Overall, the results show strong evidence that BNPL contributes to higher levels of over-indebtedness. Specifically, those respondents who used BNPL most frequently, particularly those using it constantly (around 12% of our total sample of respondents), as well as those incurring fees, incurring them more frequently, and those who are unable to pay their BNPL have much higher OID scores, around a 50% increase in some cases. Put into context, this means respondents have over-indebtedness scores of around 3, indicating that they meet the requirements for three of the five indicators we employ in this paper and suggesting a reasonable level of financial burden – one that is above average for our sample of young adults.

### **3.2 How young adults use Buy Now Pay Later matters**

To date we have considered how respondents use BNPL by considering one aspect at a time. We next employ latent class analysis, to cluster respondents based on patterns in BNPL behaviour in respondents. Based on AIC and BIC scoring, we identify three clusters within BNPL users.<sup>4</sup> For each respondent, we estimate the probability they fall within a particular class and assign them to a class only if their probability is greater than 50%. As a result, we find 17 respondents for whom none of the three classes have a probability greater than 50%, and those respondents are not assigned to any group. Table 7 gives the details of the probability of people falling into each class, and the factors that determine the make-up of each class. We label the first class “savvy users”, 63.4% of the sample, as they appear to use BNPL well. We find that savvy users have a low incidence of incurring fees, and of

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<sup>4</sup> The AIC and BIC were lower for three clusters than for either two or four clusters. This is consistent with the method used in prior studies to identify the appropriate number of clusters.

having incurred fees three times or more. In addition, they are unlikely to use debt to repay BNPL, be unable to repay their BNPL, use BNPL for essential spending, and they can accurately identify that BNPL is a form of debt.

The second class we label “walking the line”, about 18% of our sample. These users are making some mistakes in how they use BNPL but are not ringing alarm bells in terms of problem debt. They are more likely to incur fees than our savvy users but are unlikely to incur fees more than three times. They are much more likely to use debt to repay their BNPL balances and have a similar rate of being unable to repay as our third class (“in trouble”). However, “walking the line” respondents don’t use BNPL for essential spending often. There is some evidence to suggest they don’t understand BNPL, as they are least likely to view it as debt nor as a relatively cheap form of credit. The last group are the most problematic BNPL users, respondents we refer to as “in trouble”. They make up around 16% of our young adult BNPL users. These respondents incur fees frequently and are most likely to get fees often. They are also more likely than not to be unable to pay due to lack of funds, use BNPL for essential spending often, have been suspended from using BNPL quite often, and see BNPL as cheaper than other debt.

In Table 8 we look at the demographic, financial capability, and behavioural member characteristics of each class. Despite women being heavier users of BNPL, they are on average better users. Nearly three-quarters of women are savvy users compared with just over half of men, and at the other end of the scale 20.3% of men are in trouble versus 13% of women. There is little pattern in the age breakdown except that younger users are less likely to be in trouble and generally more likely to be in class 2 (walking the line). We observe that Indian, Māori, Pasifika and Pākehā users all had higher percentages in class 3 (in trouble), while Asian and European respondents were least likely to be in trouble (class 3). We find low percentages of in trouble respondents who are studying full time or who are self-employed. Interestingly, those in full-time employment have an 18.6% chance of being classed as in trouble, like those who are out of work, either not looking for and looking for work. Those studying full-time also have a very high percentage of savvy users, followed by those not looking for work. Those studying part time are more likely to be walking the line. Surprisingly, those describing themselves as owning a home without a mortgage have the highest percentage of in trouble respondents, and very low percentages of savvy users compared with other categories. Those living rent-free have the highest rate of savvy users. Those without dependents have the highest percentage of savvy users and decline as the number of dependents increase. Likewise, we see the percentage walking line (class 2) increase as dependents increase, while those with 1-2 dependents are more likely to be in trouble (class 3).

In terms of income, the highest quartile has the highest percentage of those in trouble, while quartile 1 has the lowest percentage of savvy users and the highest class as walking the line. This suggests overall high income does not prevent users from displaying poor BNPL use. For general debt use, we observe those in trouble are more common in respondents who use ‘bad’ debt types such as personal loans, overdrafts, hire purchases and mobile and fixed term contracts. Respondents with personal loans and hire purchases are also less likely to be savvy users. In contrast, those with mortgages and student loans are less likely to be in trouble, and more likely to be savvy users. Those in trouble have on average more debts overall, 5 vs around 3 for savvy users. Interestingly, those walking the line have the least number of debts. However, we observe average debt repayments go up across the three classes, with those in trouble paying over twice that of savvy users.

In terms of financial capability and behaviour, we observe little difference in financial capability between the three categories. However, debt literacy and money management are higher in savvy users, although it is very similar between classes 2 and 3. In terms of behavioural factors, in line with expectations we observe savvy users are less materialistic, tolerant of debt, impulsive and present orientated compared with those in trouble. Interestingly, those walking the line (class 2) have the lowest materialism, debt tolerance, impulsivity, and present orientation, perhaps explaining why they appear to be less experienced with debt. Those in trouble (class 3) are those most likely to exhibit problematic BNPL use and appear to be highly motivated by material possessions, have low self-control, and be less future orientated. We also see a strong link between the classes and the over-indebtedness scores, with savvy users averaging a score of 1.82 while those in trouble average over a full point more at 2.89.

Finally, we undertake ordered logit regressions where we regress respondents’ class against the OID score and report the coefficients as odds ratios (Table 9). We observe strong evidence that those using BNPL poorly have higher OID scores, even after controlling for other debt use. After controlling for demographic, knowledge, behavioural factors, and debt use, we observe moving up one class results in a nearly 40% increase in the likelihood of having a higher OID score. In columns 2-4, we add in BNPL use and the frequency of BNPL use, neither of which were included in our latent class analysis. The results show that use of BNPL and unlike previous results, frequency of use, does not significantly increase OID when we control for the class variable. This suggests that it is poor use of BNPL drives the increase in over-indebtedness. Given over 16% of the sample falls into this the ‘in trouble’ class, the result is concerning. Projecting to the New Zealand population, with approximately 350,000 young adults, our findings suggest there could be around 56,000 young adults in trouble.

In terms of control variables, we observe that of the demographic variables only looking for work is significant. The coefficients indicate being unemployed has a very strong impact on over-indebtedness of respondents, in line with the over-indebtedness literature. We also observe that materialistic and impulsive respondents are more likely to have a higher OID score. Income, on the other hand, reduces the likelihood of having a higher OID score. As we would expect, debt use is strongly associated with higher problem debt. In particular, mortgages are associated with higher over-indebtedness after controlling for everything else. This is not surprising, due to the high cost of New Zealand property resulting in people carrying large mortgages, despite it being considered ‘good’ debt. We also observe that many of the ‘bad’ debts respondents hold are also associated with higher over-indebtedness, including personal loans, overdrafts, hire purchases, mobile and fixed term contracts. Interestingly, we also observe credit card use is associated with higher OID once we add in our BNPL classes. Credit cards, functionally, are very similar to BNPL and have been suggested as substitutes in the literature (Groton & Hjorthol, 2021) although we do not observe evidence of BNPL as a replacement for credit cards in our sample. In contrast to most of the debt types, student loans appear to reduce the probability of having a higher OID score. Finally, both the number of debts and the size of the debt repayments also significantly increase the probability of being over-indebted.

#### **4. Concluding Remarks**

In this paper, we contribute to a growing literature exploring over-indebtedness and Buy Now Pay Later (BNPL) credit products, specifically by examining the experience of young adults in New Zealand. Despite the explosion in popularity of these platforms, regulators remain unsure how best to capture them within existing consumer finance laws, and indeed, if they ought to be captured at all. This regulatory ‘black hole’ allows BNPL providers to lend to applicants with few restrictions, save for those imposed by the individual platforms themselves. The lack of affordability and suitability checks both for individual platforms, but also across the industry, mean unwise BNPL use could lead to users becoming over-indebted in ways other forms of debt cannot. Due to their low and unstable incomes, and persistently low financial literacy and experience, young adults are acutely at risk of BNPL misuse.

Using an online panel of 705 New Zealand young adults aged 18-34 years, we investigate the relationship between BNPL use and over-indebtedness. We find strong evidence that indicators of over-indebtedness are more prevalent in those who use BNPL, and especially those who use it poorly, i.e., incurring fees frequently and needing to borrow to repay their BNPL balance. The results suggest there are good reasons for governments to extend existing consumer finance regulations to BNPL.

However, not all BNPL use is created equal and approximately 63% of the users in our sample appear to be ‘savvy’ – potentially exploiting the generally low-cost convenience and accessibility that BNPL platforms offer.

But what of the remaining 34% of our young adults using BNPL? For the 16% of respondents using BNPL poorly, specifically those unable to pay their balances, incurring fees and using BNPL to pay for essentials, they are likely to have much higher over-indebtedness scores. In a New Zealand young adult population of about 350,000, this equates to potentially 56,000 users who may be classed as ‘in trouble’. Our findings raise the possibility that BNPL, certainly in its current unregulated form, could do significant damage to an economically vulnerable group, young adults. Mistakes made in early adulthood are difficult to undo and may impact financial stability moving forward. Some regulatory effort to mitigate or limit poor use of BNPL is therefore warranted, and our study provides guidance on what potential moments of intervention may be.



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## Figures and Tables

Table 1 – Over-indebtedness and Buy Now Pay Later use by demographics

Column	BNPL Frequency of Use							BNPL Fees Frequency							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	OID	BNPL Use	Once	Couple of Times	Every 2-3 Months	Monthly	Constant	Incurred Fees	Once	Twice	Three	Three or More	Debt to Repay	Forgot	Lacked Funds
Full Sample	2.07	71.3%	13.5%	30.0%	22.3%	17.3%	16.9%	34.6%	45.5%	31.7%	12.2%	10.6%	41.7%	53.4%	41.8%
Gender															
Men	2.14	68%	17.9%	34.2%	16.8%	14.7%	16.3%	35.8%	51.2%	33.3%	8.3%	7.1%	59.5%	53.6%	41.7%
Female	2.02	74%	10.9%	26.4%	26.1%	19.4%	17.3%	34.2%	41.3%	30.8%	14.4%	13.5%	30.6%	53.8%	41.3%
Age Group															
18-20	2.03	64%	19.4%	31.9%	22.2%	12.5%	13.9%	27.8%	55.6%	25.9%	7.4%	11.1%	25.0%	37.0%	55.6%
21-23	2.00	73%	7.7%	40.4%	28.8%	10.6%	12.5%	37.5%	34.1%	29.5%	27.3%	9.1%	42.3%	52.3%	45.5%
24-26	2.05	77%	12.8%	28.7%	19.1%	23.4%	16.0%	40.4%	51.2%	23.3%	11.6%	14.0%	40.4%	55.8%	37.2%
27-29	2.10	75%	16.2%	24.3%	27.0%	16.2%	16.2%	37.8%	42.4%	48.5%	6.1%	3.0%	47.3%	60.6%	36.4%
30-32	2.27	72%	13.5%	25.0%	18.8%	17.7%	25.0%	28.1%	42.9%	32.1%	3.6%	21.4%	43.8%	50.0%	42.9%
33-34	1.78	65%	15.0%	25.0%	12.5%	30.0%	17.5%	35.0%	57.1%	35.7%	7.1%	0.0%	57.5%	71.4%	28.6%
Ethnicity															
Māori	2.19	77%	19.4%	24.3%	28.2%	17.5%	10.7%	47.6%	44.8%	27.6%	13.8%	13.8%	41.7%	56.9%	36.2%
Pakeha	2.06	75%	10.0%	28.7%	22.7%	19.3%	19.3%	36.7%	45.3%	35.0%	10.3%	9.4%	40.0%	54.7%	41.0%
Pasifika	2.12	72%	10.6%	31.9%	23.4%	17.0%	17.0%	42.6%	30.4%	30.4%	26.1%	13.0%	38.3%	56.5%	39.1%
Asian	1.98	56%	8.6%	48.6%	28.6%	5.7%	8.6%	22.9%	64.3%	21.4%	0.0%	14.3%	42.9%	57.1%	42.9%
Indian	2.42	76%	9.7%	32.3%	12.9%	22.6%	22.6%	19.4%	50.0%	40.0%	10.0%	0.0%	54.8%	50.0%	50.0%
European	1.77	67%	26.5%	26.5%	20.6%	17.6%	8.8%	26.5%	50.0%	16.7%	16.7%	16.7%	29.4%	25.0%	75.0%
Other	1.85	55%	18.2%	9.1%	54.5%	0.0%	18.2%	45.5%	33.3%	50.0%	16.7%	0.0%	45.5%	33.3%	66.7%
Employment Status															
Fulltime	2.01	75%	12.6%	29.1%	20.2%	18.5%	19.5%	36.4%	45.5%	35.0%	10.6%	8.9%	47.4%	56.9%	38.2%
Part Time	2.09	65%	11.3%	42.5%	23.8%	13.8%	8.8%	27.5%	62.1%	20.7%	10.3%	6.9%	32.5%	69.0%	31.0%

Studying Part Time	2.15	62%	29.2%	33.3%	33.3%	0.0%	4.2%	33.3%	54.5%	18.2%	27.3%	0.0%	54.2%	45.5%	54.5%
Studying Full time	2.1	62%	12.1%	29.3%	31.0%	17.2%	10.3%	27.6%	50.0%	22.2%	16.7%	11.1%	15.5%	22.2%	66.7%
Self Employed	1.52	52%	33.3%	25.0%	16.7%	8.3%	16.7%	33.3%	20.0%	20.0%	60.0%	0.0%	41.7%	0.0%	100.0%
Not looking for work	2.12	84%	6.5%	16.1%	35.5%	19.4%	22.6%	38.7%	41.7%	0.0%	33.3%	25.0%	29.0%	58.3%	41.7%
Looking for work	2.75	74%	30.4%	4.3%	17.4%	30.4%	17.4%	43.5%	18.2%	45.5%	18.2%	18.2%	52.2%	45.5%	45.5%
Other	2.79	50%	14.3%	42.9%	14.3%	14.3%	14.3%	28.6%	50.0%	50.0%	0.0%	0.0%	0.0%	100.0%	0.0%
Housing Situation															
Own Home without Mortgage	2.24	78.3%	12.8%	23.4%	8.5%	17.0%	38.3%	30.4%	60.0%	20.0%	13.3%	6.7%	71.7%	73.3%	13.3%
Own home with mortgage	2.22	69.6%	18.4%	33.0%	19.4%	14.6%	14.6%	35.7%	47.5%	40.0%	7.5%	5.0%	52.4%	57.5%	40.0%
Renting	1.91	72.8%	12.0%	30.9%	24.3%	17.8%	15.1%	38.1%	41.5%	29.2%	14.2%	15.1%	36.2%	49.1%	44.3%
Rent-free	2.26	64.5%	18.3%	23.9%	25.4%	19.7%	12.7%	39.7%	43.3%	36.7%	10.0%	10.0%	34.3%	53.3%	46.7%
Other	2.07	77.4%	8.3%	37.5%	25.0%	12.5%	16.7%	33.3%	50.0%	0.0%	30.0%	20.0%	50.0%	30.0%	60.0%
Dependents															
0	1.86	71.2%	13.9%	31.1%	22.5%	17.1%	15.4%	30.0%	45.1%	28.6%	15.4%	11.0%	33.0%	59.3%	35.2%
1	2.25	79.7%	14.4%	24.6%	17.8%	22.9%	20.3%	37.7%	48.9%	29.8%	8.5%	12.8%	56.9%	51.1%	42.6%
2	2.42	64.9%	8.2%	32.8%	29.5%	9.8%	19.7%	43.9%	31.0%	37.9%	20.7%	10.3%	58.3%	48.3%	48.3%
3	2.26	60.6%	10.0%	35.0%	25.0%	10.0%	20.0%	66.7%	50.0%	28.6%	14.3%	7.1%	33.3%	42.9%	50.0%
4	2.25	64.0%	25.0%	43.8%	12.5%	18.8%	0.0%	85.7%	42.9%	35.7%	0.0%	21.4%	62.5%	35.7%	64.3%
5	2.42	75.0%	44.4%	11.1%	22.2%	0.0%	22.2%	57.1%	66.7%	16.7%	0.0%	16.7%	66.7%	33.3%	50.0%
Income															
Quartile 1	2.70	62%	17.1%	37.1%	24.8%	9.5%	11.4%	44.8%	42.6%	33.3%	16.7%	7.4%	45.7%	40.7%	55.6%
Quartile 2	2.30	73%	5.3%	27.4%	25.7%	23.9%	17.7%	34.5%	39.5%	37.2%	9.3%	14.0%	33.6%	51.2%	44.2%
Quartile 3	1.58	77%	11.7%	22.5%	25.8%	25.0%	15.0%	34.2%	34.8%	37.0%	15.2%	13.0%	37.5%	63.0%	30.4%
Quartile 4	1.61	77%	17.2%	33.6%	15.5%	9.5%	24.1%	28.4%	65.8%	18.4%	7.9%	7.9%	53.4%	63.2%	34.2%
Debt Use															
Mortgage	2.32	69.0%	17.3%	33.7%	20.4%	16.3%	12.2%	39.1%	57.1%	33.3%	4.8%	4.8%	56.1%	57.1%	40.5%
Personal Loan	2.85	86.1%	16.1%	24.1%	16.1%	17.2%	26.4%	62.7%	41.1%	26.8%	12.5%	19.6%	70.1%	62.5%	35.7%

Credit Card	2.45	75.0%	13.6%	30.3%	18.2%	18.2%	19.7%	37.57%	45.0%	28.8%	12.5%	13.8%	61.9%	55.0%	41.25%
Overdraft	2.77	78.6%	10.9%	26.1%	20.7%	20.7%	21.7%	60.2%	35.1%	33.3%	15.8%	15.8%	51.1%	49.1%	43.9%
Student Loan	1.91	70.6%	14.6%	28.6%	25.0%	17.7%	14.1%	34.4%	35.3%	27.9%	20.6%	16.2%	31.4%	47.1%	47.1%
Car Loan	2.47	79.0%	17.3%	24.5%	21.4%	17.3%	19.4%	36.2%	39.5%	21.1%	31.6%	7.9%	50.0%	52.6%	39.5%
Hire Purchase	3.00	75.5%	13.5%	40.5%	29.7%	8.1%	8.1%	68.6%	30.8%	42.3%	23.1%	3.8%	77.8%	38.5%	61.5%
Mobile Contract	2.70	80.0%	10.1%	18.5%	22.7%	22.7%	26.1%	44.8%	34.5%	32.7%	21.8%	10.9%	50.4%	45.5%	49.1%
Fixed Term Contract	3.13	62.0%	9.7%	25.8%	16.1%	19.4%	29.0%	46.7%	26.7%	40.0%	6.7%	26.7%	67.7%	33.3%	66.7%
Non-bank Debt	2.83	69.7%	17.4%	15.2%	28.3%	15.2%	23.9%	57.1%	42.9%	21.4%	17.9%	17.9%	42.9%	28.6%	64.3%
Number of Debts	2.42							3.07					3.01		
	3.58	2.80	2.90	3.06	4.26	5.41	4.52	3.50	4.16	6.19	5.96	4.29	4.00	4.85	
Debt Repayments	2116.5							1514.17					898.7		
	1769.9	2361.9	1753.3	1144.9	17.01.9	2189.6	2297.5	2395.0	2551.6	1157.69	1330.5	2932.0	2613.5	1559.67	

Table 2 – BNPL Use by Financial Knowledge and Behaviour

	Fin Cap	Debt Lit	Money Mngt	Materialism	Debt Attitude	Impulsiveness	Present Orientation
Do you use BNPL							
No	10.27	1.14	32.36	3.15	2.69	2.65	2.60
Yes	10.51	1.12	32.91	3.28	2.74	2.85	2.97
Diff Y - N	0.24	-0.02	0.55	0.12**	0.05	0.2*	0.37***
How often have you used BNPL							
Once	10.44	1.22	32.48	3.19	2.60	2.45	2.68
2-3 time	10.75	1.06	33.03	3.22	2.71	2.62	2.83
Every 2-3 months	10.00	1.19	32.88	3.24	2.70	2.90	2.96
Monthly	10.04	1.07	33.77	3.32	2.80	3.06	3.13
Constantly	11.08	1.11	32.19	3.45	2.90	3.33	3.28
Diff Constantly-Once	0.63	-0.1	-0.29	0.25**	0.30***	0.89***	0.61***
Use Debt to repay BNPL							
No	10.19	1.25	34.14	3.19	2.59	2.70	2.76
Yes	11.01	0.96	31.32	3.40	2.94	3.06	3.26
Diff Y - N	-0.70**	0.3***	2.82***	-0.21***	-0.33***	-0.35***	-0.5***
Incurred Fees							
No	11.05	1.16	34.78	3.20	2.72	2.68	2.79
Yes	9.59	1.07	29.81	3.44	2.78	3.21	3.34
Diff Y - N	-1.54***	-0.1	-4.98***	0.24***	0.06	0.53***	0.55***
Frequency of Fees							
Once	10.20	1.09	31.08	3.42	2.84	3.10	3.21
Twice	9.77	0.93	29.95	3.44	2.80	3.10	3.27
Three	8.39	1.09	27.04	3.31	2.63	3.22	3.17
More	8.62	1.20	29.05	3.27	2.51	3.15	3.40
Diff More-Once	-1.58**	0.11	-2.03	-0.15	-0.30*	0.05	0.19
Reason for Fees							
Forgot	10.52	1.10	31.26	3.42	2.70	3.09	3.36
Unable to pay	8.74	1.00	28.04	3.37	2.65	3.19	3.10
Diff Unable - Forgot	-1.7***	-0.09	-0.29***	-0.06	-0.16*	0.13	-0.26*

Table 3 – Over-indebtedness Indicators and Buy Now Pay Later

	Mean OID	Diff in Mean OID
Do you use BNPL		
No	1.893	
Yes	2.117	0.224*
How often have you used BNPL		
Once	1.948	
2-3 times	1.934	
Every 2-3 months	1.923	
Monthly	2.244	
Constantly	2.692	0.744***
Use Debt to repay BNPL		
No	1.733	
Yes	2.606	0.873***
Incurred Fees		
No	1.780	
Yes	2.675	0.895***
Fees Frequency		
Once	2.235	
Twice	2.776	
Three	3.130	
More	3.211	0.976***
Reason for incurring fees		
Forgot	2.464	
Unable to pay	2.908	0.444*

Table 4 – Ordered Logistic Regression Outputs (probability of OID – indicator ranges 0-5)

	1	2	3	4	5	6
Use	0.168 (0.910)					
Use Freq		0.274*** (3.159)				
Debt to Repay			0.299 (1.289)			
Fees				0.578** (2.294)		
Fees Freq					0.401** (2.350)	
Forgot						1.599** (2.021)
Lack Funds						1.771** (2.267)
Age	-0.003 (-0.152)	-0.002 (-0.097)	0.004 (0.176)	0.006 (0.224)	0.007 (0.188)	0.000 (0.006)
Gender	-0.042 (-0.254)	-0.133 (-0.635)	-0.029 (-0.139)	-0.025 (-0.118)	0.076 (0.175)	0.049 (0.116)
Māori	-0.104 (-0.467)	-0.245 (-0.959)	-0.315 (-1.235)	-0.519* (-1.949)	-0.823** (-2.245)	-0.854** (-2.246)
Pakeha	-0.236 (-1.041)	-0.425 (-1.561)	-0.283 (-1.039)	-0.460* (-1.709)	-0.531 (-1.315)	-0.690 (-1.625)
Pasifika	-0.089 (-0.321)	0.201 (0.671)	0.231 (0.769)	0.313 (0.960)	-0.184 (-0.338)	-0.052 (-0.096)
Asian	-0.049 (-0.132)	-0.106 (-0.207)	-0.010 (-0.019)	-0.088 (-0.177)	-0.321 (-0.483)	-0.486 (-0.649)
Indian	0.424 (1.063)	-0.126 (-0.272)	0.097 (0.218)	-0.283 (-0.664)	-0.700 (-0.788)	-1.109 (-1.179)
European	-0.477 (-1.333)	-0.489 (-1.027)	-0.459 (-0.984)	-0.784* (-1.730)	-1.112 (-1.341)	-1.390 (-1.554)
Full Time	0.181 (0.631)	-0.121 (-0.387)	-0.042 (-0.130)	-0.086 (-0.259)	-0.309 (-0.584)	-0.308 (-0.557)
Part Time	0.223 (0.892)	0.085 (0.292)	0.114 (0.370)	0.177 (0.570)	-0.451 (-0.861)	-0.757 (-1.361)
Study Part	-0.049 (-0.139)	0.052 (0.113)	-0.096 (-0.202)	0.009 (0.021)	-0.568 (-0.673)	-0.550 (-0.650)
Study Full	0.078 (0.252)	-0.032 (-0.083)	0.063 (0.159)	-0.058 (-0.149)	-0.368 (-0.460)	-0.528 (-0.624)
Self Employed	-0.306 (-0.774)	0.011 (0.026)	0.264 (0.662)	0.279 (0.693)	-0.543 (-0.644)	-0.560 (-0.628)
Not Looking for Work	0.122 (0.252)	-0.319 (-0.659)	-0.135 (-0.272)	-0.172 (-0.335)	-0.279 (-0.411)	-0.279 (-0.404)
Looking for Work	1.544*** (3.932)	1.344*** (3.461)	1.306*** (3.288)	1.276*** (2.995)	1.371** (2.079)	1.711** (2.434)



Own Home without Mortgage	0.288 (0.563)	0.178 (0.309)	0.362 (0.571)	0.063 (0.105)	1.547 (1.118)	1.773 (1.370)
Own Home with Mortgage	-0.245 (-0.589)	-0.076 (-0.160)	-0.084 (-0.163)	-0.467 (-0.953)	0.859 (0.977)	0.917 (1.021)
Renting	-0.076 (-0.217)	0.019 (0.049)	0.048 (0.109)	-0.331 (-0.830)	0.881 (1.146)	1.030 (1.307)
Rent free	0.356 (0.903)	0.548 (1.170)	0.636 (1.242)	0.207 (0.437)	1.451* (1.847)	1.372* (1.667)
Fin Cap	-0.020 (-0.606)	-0.058 (-1.486)	-0.061 (-1.589)	-0.032 (-0.785)	-0.078 (-1.060)	-0.135* (-1.868)
Debt Lit	-0.091 (-0.777)	-0.036 (-0.264)	-0.029 (-0.207)	-0.062 (-0.432)	-0.026 (-0.102)	-0.006 (-0.022)
Money Mngt	-0.007 (-0.471)	0.011 (0.609)	0.014 (0.809)	0.016 (0.912)	0.056** (2.041)	0.072*** (2.579)
Debt Attitudes	0.220 (1.531)	0.144 (0.764)	0.125 (0.657)	0.112 (0.571)	0.197 (0.626)	0.194 (0.631)
MVS	0.001 (0.009)	0.087 (0.507)	0.164 (0.963)	0.136 (0.745)	0.275 (0.764)	0.331 (0.955)
Impulsive	0.194** (2.482)	0.205** (2.105)	0.236** (2.466)	0.232** (2.356)	0.178 (0.960)	0.113 (0.574)
Present Orientation	-0.051 (-0.620)	0.020 (0.195)	0.018 (0.179)	0.021 (0.202)	0.028 (0.171)	0.111 (0.642)
Dependents	0.018 (0.230)	0.053 (0.525)	0.066 (0.655)	-0.037 (-0.360)	0.079 (0.475)	0.055 (0.295)
Income	-0.701*** (-10.740)	-0.780*** (-8.555)	-0.732*** (-8.426)	-0.750*** (-8.326)	-0.688*** (-4.420)	-0.689*** (-4.529)
Have Mortgage	0.490 (1.283)	0.330 (0.941)	0.163 (0.458)	0.203 (0.529)	-0.423 (-0.799)	-0.611 (-1.116)
Have Personal Loan	0.722** (2.264)	0.590* (1.670)	0.481 (1.302)	0.425 (1.129)	-0.178 (-0.371)	-0.114 (-0.230)
Have Credit Card	0.471** (1.963)	0.521** (1.993)	0.338 (1.265)	0.395 (1.507)	-0.231 (-0.568)	-0.233 (-0.576)
Have Overdraft	0.598** (2.015)	0.530* (1.645)	0.505 (1.522)	0.441 (1.339)	-0.102 (-0.274)	-0.082 (-0.213)
Have Student Loan	-0.278 (-1.227)	-0.161 (-0.604)	-0.274 (-1.062)	-0.256 (-0.943)	-0.460 (-1.197)	-0.520 (-1.228)
Have Car Loan	-0.225 (-0.828)	-0.016 (-0.053)	-0.078 (-0.264)	-0.109 (-0.359)	-0.190 (-0.450)	-0.191 (-0.433)
Have Hire Purchase	0.302 (0.826)	0.608 (1.384)	0.194 (0.451)	0.255 (0.577)	0.299 (0.601)	0.209 (0.405)
Have Mobile Contract	0.536** (1.985)	0.494* (1.666)	0.460 (1.481)	0.456 (1.402)	-0.020 (-0.037)	-0.161 (-0.285)
Have Fixed-Term Contract	1.047*** (2.764)	1.081** (2.155)	1.000** (1.968)	1.233** (2.274)	-0.526 (-0.530)	-0.713 (-0.683)
Have Non-Bank Debt	0.241 (0.762)	0.287 (0.782)	0.272 (0.722)	0.096 (0.259)	-0.203 (-0.315)	-0.083 (-0.125)

Number of Debts	0.519***	0.466***	0.562***	0.609***	0.984***	1.059***
	(3.092)	(2.635)	(3.111)	(3.313)	(4.152)	(4.184)
Debt Repayments	0.000*	0.000***	0.000***	0.000***	0.000*	0.000**
	(1.946)	(3.192)	(2.838)	(2.724)	(1.784)	(1.970)
Observations	662	477	471	455	192	192
Pseudo R-Square	0.221	0.242	0.234	0.239	0.221	0.220

Table 5 - Marginal Effects on Over-Indebtedness

	0	1	2	3	4	5
Do you use BNPL						
Yes	-0.013	-0.013	0.004	0.009	0.008	0.005
How often have you used BNPL						
Couple of Times	-0.046	-0.035*	0.017	0.027	0.022	0.015
Every 2-3 months	-0.023	-0.015	0.009	0.012	0.010	0.007
Monthly	-0.042	-0.031	0.016	0.024	0.020	0.013
Constantly	-0.103***	-0.119***	0.017	0.076***	0.072***	0.057***
Use Debt to repay BNPL						
Yes	-0.022	-0.024	0.005	0.016	0.015	0.010
Incurred Fees						
Yes	-0.040**	-0.048**	0.010**	0.031**	0.028**	0.019**
Fees Frequency						
Twice	0.003	0.004	0.001	-0.002	-0.003	-0.003
Thrice	-0.037*	-0.067	-0.028	0.022*	0.050	0.060
More	-0.048**	-0.095**	-0.049	0.024**	0.072**	0.096*
Reason for incurring fees						
Forgot	-0.093*	-0.102***	-0.022**	0.036**	0.071***	0.109*
Broke	-0.084**	-0.122***	-0.058**	0.037**	0.105**	0.122**

Table 6 – Propensity Score Matching Average Treatment Effect

	ATE	ATT
Use	-0.094	-0.055
Debt to Repay BNPL	0.234***	0.377**
Fees	0.589***	0.288*
Forgot	0.089	-0.030
Broke	0.286	-0.012

Table 7

	Class One Savvy Users	Class Two Walking the line	Class Three In Trouble
Incurred fees	0.190	0.518	0.691
Incurred fees 3+ times	0.169	0.085	0.376
Debt to repay BNPL	0.145	0.799	0.895
Unable to repay	0.242	0.519	0.521
Essential items	0.067	0.192	0.456
Small discretionary	0.513	0.278	0.691
Large discretionary	0.384	0.148	0.520
BNPL is debt	0.828	0.473	0.696
BNPL is cheaper	0.837	0.000	0.923
Been Suspended	0.000	0.502	0.594
Number in Class	450	125	113

Table 8

	Class One	Class Two	Class Three
Full Sample			
Gender			
Men	52.5%	24.6%	20.3%
Female	72.3%	12.5%	13.0%
Age Group			
18-20	70.7%	17.2%	8.6%
21-23	61.5%	24.3%	12.8%
24-26	58.6%	14.8%	24.2%
27-29	63.5%	15.4%	18.3%
30-32	67.8%	14.0%	16.1%
33-34	59.1%	21.2%	16.7%
Ethnicity			
Māori	61.1%	19.4%	18.1%
Pakeha	65.5%	15.2%	16.9%
Pasifika	62.7%	19.4%	17.9%
Asian	59.4%	26.1%	8.7%
Indian	65.9%	11.4%	20.5%
European	66.1%	23.2%	10.7%
Other	71.4%	9.5%	14.3%
Employment Status			
Fulltime	61.7%	16.7%	18.6%
Part Time	61.9%	23.9%	11.9%
Studying Part Time	53.5%	32.6%	14.0%
Studying Full time	81.7%	15.1%	3.2%
Self Employed	69.6%	26.1%	4.3%
Not looking for work	73.7%	7.9%	18.4%
Looking for work	67.6%	11.8%	17.6%
Other	81.3%	12.5%	6.3%
Housing Situation			
Own Home without Mortgage	36.7%	31.7%	30.0%
Own home with mortgage	60.8%	20.3%	13.5%
Renting	66.3%	17.7%	14.6%
Rent-free	72.7%	8.2%	17.3%
Other	71.0%	12.9%	12.9%
Dependents			
0	72.0%	13.7%	11.5%
1	54.7%	18.9%	25.0%
2	51.1%	23.4%	22.3%
3	63.6%	21.2%	15.2%
4	48.0%	32.0%	16.0%
5	41.7%	50.0%	8.3%
Income			
Quartile 1	54.0%	29.5%	15.3%
Quartile 2	67.3%	13.9%	17.0%

Quartile 3	68.8%	14.4%	13.8%	
Quartile 4	63.4%	12.4%	20.5%	
Debt Use				
Mortgage	58.5%	18.3%	18.3%	
Personal Loan	39.6%	24.8%	33.7%	
Credit Card	52.7%	20.8%	23.1%	
Overdraft	54.7%	16.2%	28.2%	
Student Loan	72.4%	13.2%	12.9%	
Car Loan	60.5%	14.5%	23.4%	
Hire Purchase	38.8%	30.6%	30.6%	
Mobile Contract	59.1%	13.4%	26.2%	
Fixed Term Contract	62.0%	14.0%	24.0%	
Non-bank Debt	65.2%	13.6%	19.7%	
Number of Debts	2.98	2.63	5.03	
Debt Repayments	1455.29	2141.75	3250.35	
Financial Capability	10.34	10.34	10.78	0.44
Debt Literacy	1.22	0.90	0.94	-0.28***
Money management	33.78	30.28	31.10	-2.68***
Materialism	3.20	3.00	3.59	0.39***
Debt Attitudes	2.67	2.65	3.04	0.37***
Impulsivity	2.75	2.39	3.33	0.58***
Present Orientation	2.77	2.62	3.39	0.62***
OID	1.82	2.18	2.89	1.07***

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Table 9 – Ordered Logit Regression Outputs (probability of OID – indicator ranges 0-5)

	1	2	3	4
BNPL Class	1.389** (2.483)	1.376** (2.410)	1.341** (2.211)	1.339** (2.206)
Use		1.116 (0.581)		0.772 (-0.869)
Use Freq			1.087 (1.455)	1.149 (1.561)
Age	0.997 (-0.123)	0.998 (-0.120)	0.995 (-0.222)	0.994 (-0.294)
Gender	1.024 (0.136)	1.015 (0.084)	0.987 (-0.077)	0.983 (-0.099)
Māori	0.922 (-0.346)	0.910 (-0.401)	0.904 (-0.427)	0.920 (-0.349)
Pakeha	0.844 (-0.767)	0.833 (-0.823)	0.800 (-1.003)	0.796 (-1.023)
Pasifika	0.881 (-0.463)	0.867 (-0.517)	0.834 (-0.655)	0.835 (-0.646)
Asian	1.379 (0.872)	1.391 (0.899)	1.395 (0.913)	1.377 (0.869)
Indian	1.408 (0.757)	1.387 (0.720)	1.305 (0.575)	1.288 (0.543)
European	0.953 (-0.139)	0.943 (-0.170)	0.919 (-0.243)	0.921 (-0.239)
Full Time	0.953 (-0.174)	0.945 (-0.203)	0.929 (-0.265)	0.932 (-0.256)
Part Time	0.975 (-0.100)	0.973 (-0.110)	0.965 (-0.142)	0.964 (-0.147)
Study Part	0.810 (-0.655)	0.816 (-0.634)	0.848 (-0.518)	0.860 (-0.474)
Study Full	1.130 (0.402)	1.132 (0.409)	1.128 (0.401)	1.121 (0.381)
Self Employed	0.824 (-0.402)	0.830 (-0.391)	0.844 (-0.359)	0.843 (-0.359)
Not Looking for Work	0.964 (-0.090)	0.946 (-0.134)	0.896 (-0.267)	0.892 (-0.280)
Looking for Work	2.969*** (2.654)	2.923*** (2.625)	2.887*** (2.641)	2.941*** (2.700)
Own w/out Mortgage	1.287 (0.497)	1.294 (0.506)	1.277 (0.480)	1.255 (0.446)
Own w/ Mortgage	0.867 (-0.329)	0.867 (-0.328)	0.876 (-0.304)	0.883 (-0.288)
Renting	0.803 (-0.601)	0.803 (-0.599)	0.811 (-0.570)	0.817 (-0.554)
Rent free	1.245 (0.538)	1.260 (0.565)	1.290 (0.621)	1.284 (0.611)

Fin Cap	0.978	0.978	0.978	0.976
	(-0.674)	(-0.655)	(-0.673)	(-0.709)
Debt Lit	0.957	0.959	0.961	0.959
	(-0.373)	(-0.355)	(-0.337)	(-0.355)
Money Mngt	0.988	0.988	0.987	0.988
	(-0.731)	(-0.765)	(-0.800)	(-0.769)
Debt Attitudes	0.950	0.950	0.938	0.929
	(-0.348)	(-0.347)	(-0.439)	(-0.501)
MVS	1.556***	1.550***	1.548***	1.558***
	(3.038)	(2.990)	(2.990)	(3.028)
Impulsive	1.165*	1.167*	1.161*	1.153*
	(1.908)	(1.928)	(1.860)	(1.786)
Present Orientation	0.922	0.920	0.917	0.918
	(-0.950)	(-0.983)	(-1.019)	(-0.998)
Dependents	1.012	1.015	1.020	1.018
	(0.153)	(0.190)	(0.252)	(0.226)
Income	0.671***	0.670***	0.668***	0.668***
	(-9.968)	(-9.941)	(-9.889)	(-9.823)
Have Mortgage	1.971**	1.982**	2.056**	2.088**
	(1.983)	(2.006)	(2.132)	(2.178)
Have Personal Loan	2.464***	2.454***	2.481***	2.517***
	(2.943)	(2.928)	(2.974)	(3.044)
Have Credit Card	2.028***	2.023***	2.058***	2.090***
	(3.546)	(3.525)	(3.594)	(3.630)
Have Overdraft	2.125***	2.134***	2.145***	2.136***
	(2.874)	(2.867)	(2.886)	(2.883)
Have Student Loan	0.720*	0.726*	0.740*	0.739*
	(-1.858)	(-1.787)	(-1.660)	(-1.661)
Have Car Loan	1.165	1.166	1.173	1.176
	(0.715)	(0.717)	(0.742)	(0.756)
Have Hire Purchase	2.128*	2.138*	2.291**	2.377**
	(1.941)	(1.957)	(2.116)	(2.185)
Have Mobile Contract	1.880***	1.881***	1.853***	1.833***
	(3.346)	(3.353)	(3.308)	(3.237)
Have Fixed-Term Contract	3.293***	3.354***	3.436***	3.385***
	(3.471)	(3.491)	(3.560)	(3.503)
Have Non-Bank Debt	1.152	1.165	1.199	1.199
	(0.483)	(0.523)	(0.625)	(0.625)
Number of Debts	1.302***	1.298***	1.281***	1.277***
	(5.293)	(5.142)	(4.791)	(4.733)
Debt Repayments	1.000**	1.000**	1.000**	1.000**
	(2.316)	(2.331)	(2.365)	(2.365)
Observations	646	646	646	646
Pseudo R-Square	0.250	0.250	0.251	0.252

Note: Values are reported as odds ratios.

**Appendix 1: Propensity Score Matching for Over-Indebtedness**

	Raw Standardised Difference	Matched Standardised Difference	Raw Variance Ratio	Match Variance Ratio
Age	0.086	0.077	0.820	0.973
Gender	0.122	0.008	1.025	1.046
Māori	0.172	0.067	1.312	1.100
Pakeha	0.206	-0.136	0.949	1.084
Pasifika	0.060	0.022	1.193	1.066
Asian	-0.248	-0.083	0.528	0.780
Indian	0.031	0.062	1.115	1.260
European	-0.059	-0.068	0.833	0.817
Full Time	0.182	-0.066	0.924	1.046
Part Time	-0.178	-0.033	0.774	0.948
Study Part	-0.106	-0.138	0.689	0.628
Study Full	-0.161	0.035	0.695	1.101
Self Employed	-0.161	-0.063	0.439	0.695
Not Looking for Work	0.206	0.027	2.777	1.104
Looking for Work	0.153	0.120	2.510	1.957
Own Home without Mortgage	0.116	0.150	1.432	1.632
Own Home with Mortgage	-0.057	-0.113	0.924	0.869
Renting	0.076	-0.071	0.998	1.009
Rent free	-0.148	0.142	0.751	1.439
Fin Cap	0.025	-0.107	1.086	1.315
Debt Lit	-0.066	0.089	0.897	1.108
Money Mngt	0.036	0.038	0.863	1.045
Debt Attitudes	0.164	0.013	0.715	0.855
MVS	0.081	-0.118	0.970	1.157
Impulsive	0.147	0.067	0.887	0.987
Present Orientation	0.300	-0.003	0.879	0.834
Income	0.243	-0.002	0.759	0.944

