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Public and private debt

Links between debt types for all New Zealanders



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The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data’s ability to support Inland Revenue’s core operational requirements.

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Summary: There are significant overlaps between public and private debt

Debt takes many forms in an established financial system. This paper focuses on two categories of debt based on who the debt is owed to: public debt (debt owed to the government) and private debt (debt owed to non-government lenders).

Discussions of debt are often limited to only one of these types depending on the context. However, many New Zealanders will owe both types of debt and will experience interactions between them – for example, making repayments of one type of debt affects their ability to afford repayments of the other. It follows that a complete picture of individuals' experience of debt requires us to consider both their public and private debt.

To the best of our knowledge, this report provides the first national picture of the links between public and private debt. The key insights from our research can be summarised as follows:

- There is significant variation in the prevalence of different debt types between post codes across New Zealand.
- Public debt shows a clear cluster: Fine debt to MoJ, debt to MSD, child support and WFF debt to IR all show higher prevalence in the same post code areas. This suggests that these four debt types tend to be owed by the same kinds of people.
- Private debt shows two clusters: Buy-now pay-later, secured loan, and unsecured loan debt are more prevalent in the same post codes, and credit card and mortgage debt are more prevalent in the same post codes. This suggests that each cluster of debt tends to be owed by the same kinds of people, and that people with debt from one private debt cluster tend not to have debt from the other cluster.
- There is a clear interaction between public and private debt: The public debt cluster and the first private debt cluster show a positive relationship, while the public debt cluster and the second private debt cluster show a negative relationship. This suggests that the clustered types of public debt tend to be owed by the same kinds of people who owe the first cluster of private debt and not by the kinds of people who owe the second cluster of private debt.
- There is a clear positive relationship between public debt and our hardship measures. There is also a clear positive relationship between the first cluster of private debt and our hardship measures.
- Debt prevalence varies with deprivation. Examining the relationship between deprivation and debt shows that in post codes with higher deprivation:
 - fine debt to MoJ, debt to MSD, child support debt to IR is much more common
 - buy-now pay-later, secured loan, and unsecured loan debt is much more common
 - credit cards and mortgage debt are much less common

The key limitation of this research is that we use data summarised by post code, not individual level data. So, while it is reasonable to expect the patterns we observe to occur at an individual level, our results only describe groups of people.

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Consider both public and private debt

Debt takes many forms in an established financial system. These forms may be divided into categories based on who debt is owed to, what debt is owed for, and who debt is owed by. For this paper we focus on two categories of who the debt is owed to: public and private.

Discussions of debt are often limited to only one of these two types – public debt (debt owed to the government) or private debt (debt owed to non-government lenders) – depending on the context. However, many New Zealanders will owe both types of debt and will experience interactions between them – for example, making repayments of one type of debt affects their ability to afford repayments of the other.

It follows that a complete picture of individuals' experience of debt requires us to consider both their public and private debt. In New Zealand to date, research covering both public and private debt has been limited to small, non-representative samples. To the best of our knowledge, this report provides the first overview of the links between public and private debt for all New Zealand residents.

We combine debt data from different sources

Data for this research was obtained from two sources. Information on public debt was drawn from government administrative records in the Integrated Data Infrastructure (IDI). Information on private debt was provided by the credit reporting agency Centrix.

The IDI is a large research database that holds individual level data about people and households. Stats NZ maintains and protects the IDI.¹ We use debt records in the IDI from the Ministry of Social Development (MSD), the Ministry of Justice (MoJ), and Inland Revenue (IR). These are the same debt records used in our previous work.²

Centrix is a credit bureau, providing credit checks and credit reporting. They hold the richest dataset of consumer credit information available in New Zealand, including comprehensive credit information, utility data, and supporting credit risk information. This information is aggregated from a wide range of sources – 72 credit providers including registered banks, finance companies, Buy Now Pay Later (BNPL), telecommunication providers, and utilities – with monthly payment behaviour data on more than 95% of credit-active individuals.

Data from the IDI and from Centrix were combined at a post code level. First, we used address information in the IDI to group people by post code and count the number with different types of public debt. Second, Centrix provided an equivalent, pre-summarised table of private debt by post

¹ More details are available on their website <https://www.stats.govt.nz/integrated-data/integrated-data-infrastructure/>.

² Social Wellbeing Agency 2022. Patterns across debt and debtors to government: Connections between debt to IR, MSD, and MoJ. Wellington, New Zealand. And the working paper *Understanding debt and debtors to government – Focus on MSD and IR debt* published at the same time.

code.³ Third, the two datasets were linked so that for each post code we could observe both the number of people with different types of public debt and the number of people with different types of private debt.

Table 1 provides an overview of the public debt types included in our analysis. Table 2 provides the same for the private debt types. We also report the percent of New Zealand residents aged 19 and over with each debt type, showing that private debt is much more common than public debt.

Table 1: Overview and explanation of public debt types

Debt type	Description	Percent of residents
Fine debt to MoJ	Includes both infringement and court fines. Infringement fines come from issuing authorities such as local councils and the Police. They become fines if they are not paid on time. Court fines arise when a judge or Justice of the Peace assigns them after a person has been found guilty of an offence.	7%
Debt to MSD	Includes both overpayment debt – when people receive payments from MSD they were not entitled to, or more of a payment than they were entitled to – and recoverable assistance debt – when people receive one-off recoverable grants to cover immediate, essential, or emergency expenses.	11%
Liabile parent child support debt to IR	Occurs when a parent or carer applies to IR to collect child support payments from a child’s parent(s) and these payments are not made in full or on time.	2%
Working for Families debt to IR	Occurs when people receive more WFF tax credits during the year than an end-of-year calculation shows they were entitled to.	1%
Income tax debt to IR	Occurs when people do not meet their obligations to pay income tax by the due date in the corresponding tax year.	4%
Overdue student loan debt to IR	Occurs when people do not meet their contracted obligation payments towards their student loan. This is determined by their income, when New Zealand based, or their student loan balance, when overseas based.	1%

Table 2: Overview and explanation of private debt types

Debt type	Description	Percent of residents
Buy-now pay-later	An emerging debt type often facilitated by smart phone apps. The customer receives the good upfront but commits to instalment repayments to the provider.	12%
Secured loan	Debt secured against the debtor’s assets. The vast majority of secured loans are vehicle loans, but also includes loans secured against other assets (such as whiteware). These debts often have a duration of six to sixty months.	3%
Unsecured loan	Other loans not secured against the debtor’s assets. This category captures a range of debt including personal loans granted by a major bank, store	8%

³ The provision of pre-summarised data from Centrix was agreed as a suitable way to preserve the privacy of both individuals and businesses. We applied the same confidentiality rules used for IDI analysis to the Centrix data before conducting our analysis.

lending, and to short term loans from fringe lenders. Centrix estimates is split approximately half each between bank and non-bank lenders.

Credit card	Revolving lines of credit. Includes major brands, such as Visa and Mastercard, but will also include store cards (for example Gem Visa and Q Card).	56%
Mortgage	Debt secured by a mortgage over the debtor’s property.	29%

When considering these debt types, it is clear that debt arises from different causes. Many types of public debt occur when people fail to meet their obligations (for example, to repay their student loan on time), some arise from overpayment of entitlements (such as WFF), and only some debt is explicitly borrowed (recoverable assistance, a subset of the debt to MSD). In contrast, all the private debt types are explicitly borrowed by the customer.

Figure 1: Debt prevalence at 10 most extreme post codes

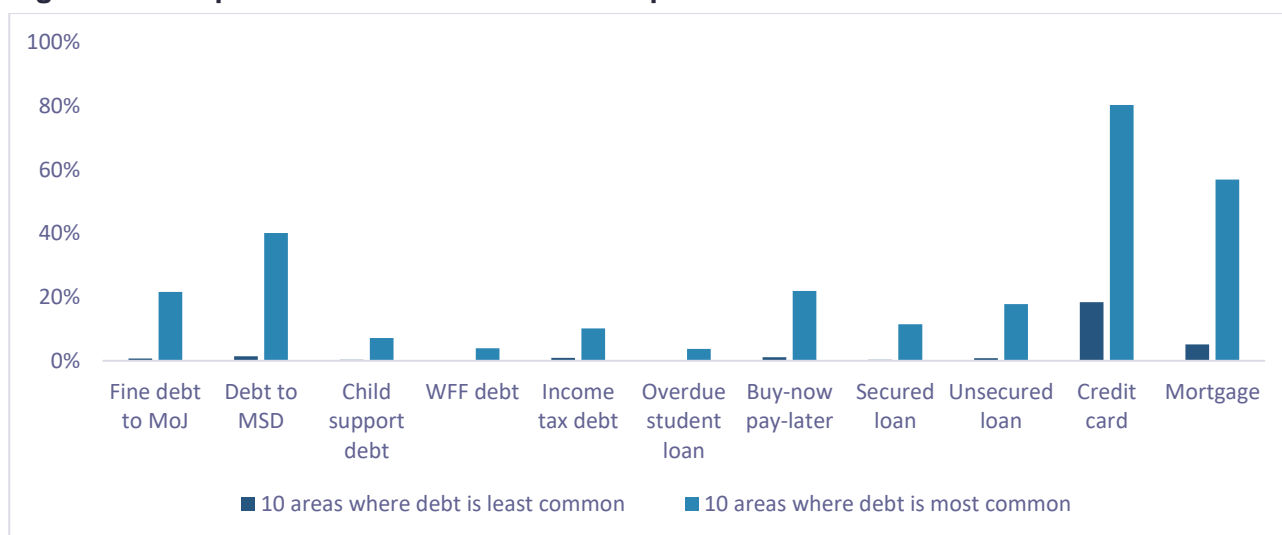


Figure 1 gives the prevalence of each type of debt in the ten post codes where each debt type is least common and in the ten post codes where each debt type is most common. This shows that there is significant variation in debt prevalence between areas. Numeric values from this figure are given in Table 6.

Note that debt to MoJ is limited to fines for this analysis as only a small number of people owe Family Court Contribution Orders (FCCO) debt and Legal Aid debt was not available in the IDI. We also exclude other types of debt owed to IR (such as donation tax credits, GST, and PAYE amounts) as they affect only a small number of people.

The private debt available for our analysis also included Telco and Utilities debt. However, as this largely reflected post-paid accounts for a household rather than individual borrowing decision, we have omitted it from our analysis.

Each debt type groups into clusters

Before comparing the two datasets, we first investigate the patterns within them. This shows distinct clusters of public debt types and of private debt types.

For clustering we calculate the Spearman correlation between the proportion of adults with each type of debt in each post code. Correlations are values between -1 and 1. A positive value indicates that the two types of debt tend to occur together, while a negative value indicates the two types of debt occur apart. The magnitude of the value indicates the strength of the relationship with -1 or 1 being a perfect relationship and 0 indicating no relationship. The values in Table 3 and Table 4 have been colour coded to aid interpretation (green for positive, orange for negative, grey for near zero).

Table 3: Correlation relationships between different types of public debt

	Fine debt to MoJ	Debt to MSD	Child support debt to IR	WFF debt to IR	Income tax debt to IR	Overdue student loan debt to IR
Fine debt to MoJ		0.82	0.71	0.47	0.36	0.27
Debt to MSD	0.82		0.70	0.54	0.25	0.35
Child support debt to IR	0.71	0.70		0.55	0.25	0.25
WFF debt to IR	0.47	0.54	0.55		0.05	0.46
Income tax debt to IR	0.36	0.25	0.25	0.05		0.15
Overdue student loan debt to IR	0.27	0.35	0.25	0.46	0.15	

Table 3 gives the correlation results for the different types of public debt. It shows that fine debt to MoJ, debt to MSD, child support and WFF debt to IR cluster together: in post code areas where one of these types of debt is more (less) common the other types of debt in this cluster are also more (less) common. This suggests that these four debt types tend to be owed by the same kinds of people.

The relationships with the other types of debt to IR are much weaker. This suggests that income tax and overdue student loan debts are not clustered with other debt types, and hence are owed by different kinds of people. This is consistent with results from our earlier analysis.

Table 4: Correlation relationships between different types of private debt

	Buy-now pay-later	Secured loan	Unsecured loan	Credit card	Mortgage
Buy-now pay-later		0.55	0.72	-0.10	0.15
Secured loan	0.55		0.60	-0.23	0.00
Unsecured loan	0.72	0.60		-0.26	0.03
Credit card	-0.10	-0.23	-0.26		0.66
Mortgage	0.15	0.00	0.03	0.66	

Table 4 gives the correlation results for the different types of private debt. It shows two clusters. The first cluster covers three debt types: Buy-now pay-later, secured loans, and unsecured loans. The second cluster covers two debt types: Credit cards and mortgages.

We also observe weak negative correlations between the two clusters. These results suggests that these two clusters reflect two different groups of people: Buy-now pay-later, secured loan, and unsecured loan debt tend to be owed by the same kinds of people and these people tend not to also owe credit card or mortgage debt. Similarly, credit card and mortgage debt tend to be owed by the same kinds of people and these people tend not to also owe buy-now pay-later, secured loan, or unsecured loan debt.

Conversations with subject matter experts highlighted that buy-now pay-later and credit cards both serve similar purposes. Buy-now pay-later is more attractive to younger demographics, compared to credit cards. Store cards are grouped together with credit cards but serve a purpose more similar to buy-now pay-later.

Regarding the clusters of private debt, some subject matter experts suspected that income levels will be the key factor that determines whether an individual is more likely to owe buy-now pay-later, secured loan, and unsecured loan debt or to owe credit card and mortgage debt. Other subject matter experts highlighted a wide range of factors including age, wealth, cashflow, preference for certainty, and debt management (centralised with bank or distributed at point of purchase).

One factor linking credit card and mortgage debt is small business ownership. Small business owners are likely to have a business credit card and may use a mortgage to inject cash into their business.

Public and private debt interact

Having examined patterns within public debt and within private debt, we now look for patterns between them. This shows significant overlap between the clusters of public and private debt identified above.

For these patterns, we use regression to estimate the effect of each debt type on the log-odds of every other type.⁴ Figure 2 and Figure 3 give the results for our regression models. In every model, the debt type on the horizontal axis has been used to estimate the debt type in the legend, and the height of the bar gives the size of the effect. All the estimates are statistically significant, except for the ones with very small magnitudes.

⁴ Log-odds, also referred to as Logit, is a standard statistical transformation used when analysing proportions or probabilities. Use of log-odds results in better models and prevents non-sensical predictions such as “110% of people have this type of debt”.

Figure 2: Estimated effect of public debt on the log-odds of private debt

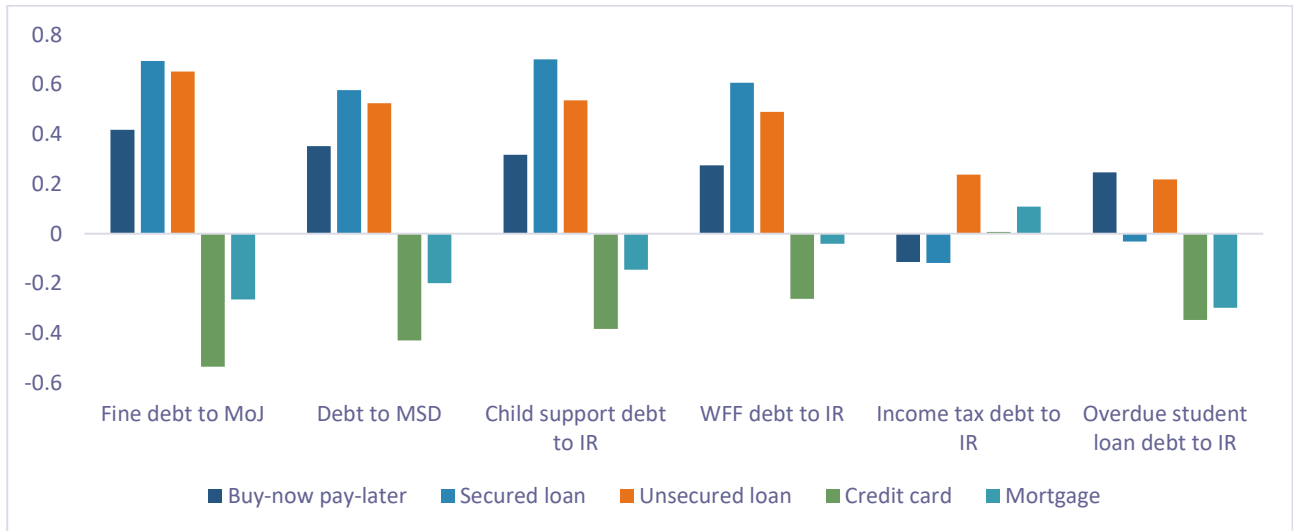
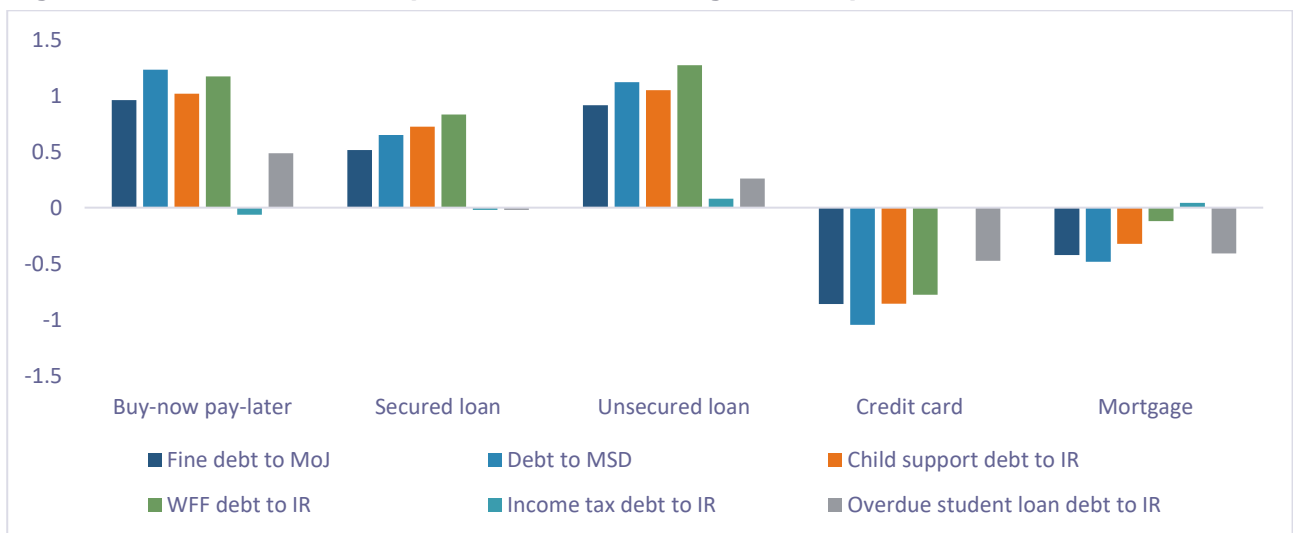


Figure 3: Estimated effect of private debt on the log-odds of public debt



Both figures show a clear positive effect between the public debt cluster we identified above (fine debt to MoJ, debt to MSD, child support and WFF debt to IR) and the first private debt cluster (buy-now pay-later, secured loan, and unsecured loan debt). We also observe a clear negative effect between the public debt cluster and the second private debt cluster (credit card and mortgage debt).

These results suggest that the clusters identified when looking at public and private debt separately overlap: the first four types of public debt tend to be owed by the same kinds of people who owe the first three types of private debt and tend not to be owed by the kinds of people who owe credit card or mortgage debt.

Conversations with subject matter experts confirmed these patterns are consistent with what they are observing at an individual level. In addition, they suggested that part of the pattern shown in Figure 2 and Figure 3 will be due to age. People who owe overdue student loan are more likely to be younger. Buy-now pay-later also tends to be more popular with younger adults, where it may serve a similar function to credit cards. In contrast, our previous research showed people who owe income tax tend to have higher incomes. So, it is reasonable to expect they are more likely to successfully apply for a mortgage or a credit card.

Debt types interact with hardship measures

Private lenders also collect information on customers' repayment history. This information is used by Centrix as part of their credit reporting to inform businesses lending decisions. We analyse this information below as hardship measures.

The results suggest that the clusters identified when looking at public and private debt also overlap with hardship: The first four types of public debt and the first three types of private debt tend to be owed by the kinds of people who are more likely to experience hardship.

Table 5 provides an overview of the hardship measures included in our analysis. Consistent with Table 1 and Table 2, we also report the percent of New Zealand residents aged 19 and over with each debt type.

Table 5: Overview and explanation of hardship measures

Debt type	Description	Percent of residents
Payment 30 days late in last 12 months	Customer was in arrears by 30 days or more any time in the last 12 months. In many cases this means that a customer has missed two payments, the initial payment and then a corrective payment within 30 days.	8%
In default	In default is more severe than arrears. Defaulted accounts typically occur when the credit provider has written off the debt. In this case the relationship between the borrower and credit provider has broken down.	11%
Statutory hardship in the last 24 months	Customers who suffer an unexpected life event (such as job loss, widowed, or divorce) can apply to their lender for 3-6 months temporary relief while they recover.	1%

In interpreting the first two measures as indicative of hardship, we are assuming that customers enter into debt in good faith, intend to follow through with their repayments, but are unable to do so due to circumstance. This will not apply to all cases.

Statutory hardship requires that the customer will be able to resume repayments once the temporary relief expires. In general, it is not available for people in poverty or facing prolonged financial hardship.

Figure 4 and Figure 5 give the results for regression models, consistent with the results displayed in Figure 2 and Figure 3. In both figures, the debt type on the horizontal axis has been used to estimate each type of hardship in the legend, and the height of the bar gives the size of the effect. All the estimates are statistically significant.

Figure 4: Estimated effect of public debt on the log-odds of hardship

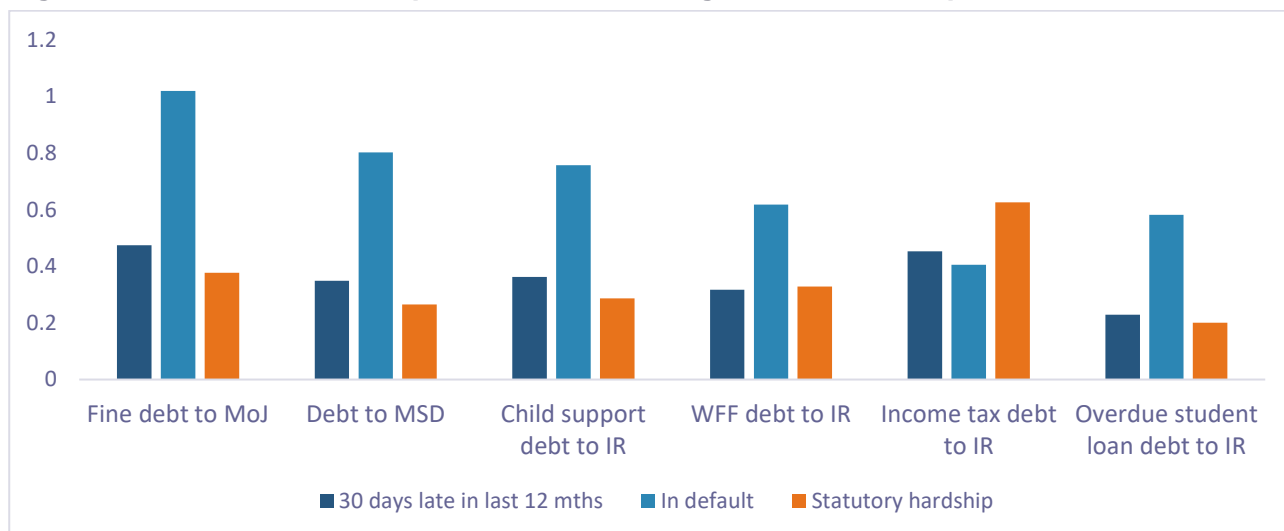


Figure 5: Estimated effect of private debt on the log-odds of hardship

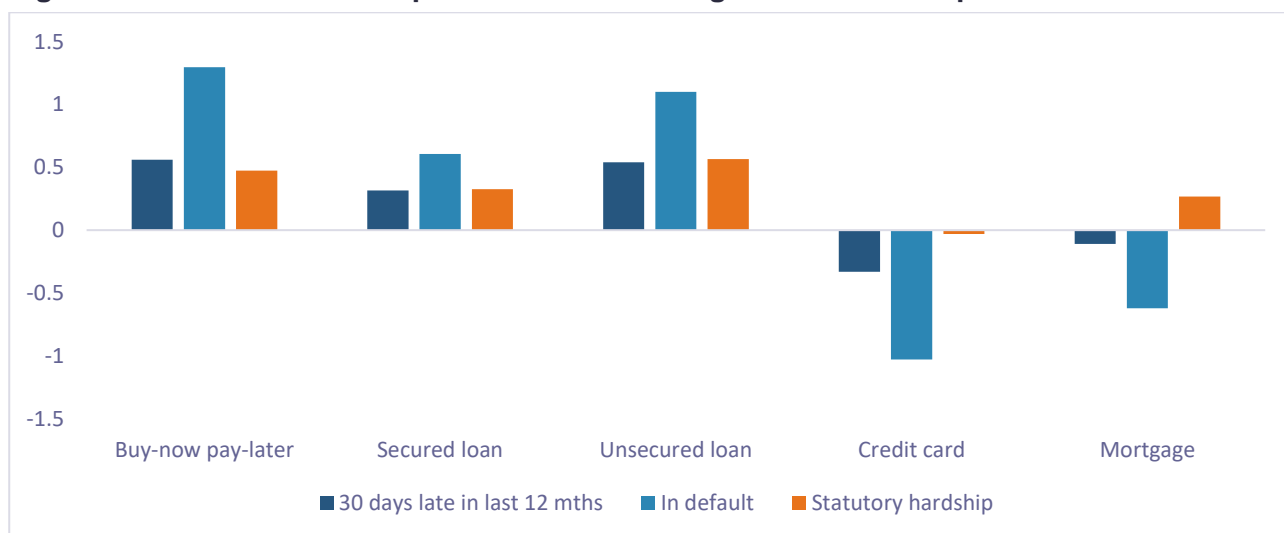


Figure 4 shows a clear positive effect between public debt and all three hardship measures. This effect is most significant for the four types of public debt we as clustering above (fine debt to MoJ, debt to MSD, child support and WFF debt to IR). Figure 5 shows a clear positive effect between the first cluster of private debt (buy-now pay-later, secured loan, and unsecured loan debt) and a negative effect with the other private debt types.

Conversations with subject matter experts highlighted that these patterns will also reflect the risk profile of lenders and the relationship between lenders and borrowers. Lenders who issue credit cards and mortgages tend to be more risk adverse than lenders who offer buy-now pay-later or unsecured loans.

The positive associate between mortgage debt and statutory hardship, and the size of the positive effect between income tax debt and statutory hardship, might seem unusual at first. We suspect this is explained by financial knowhow. People with greater knowledge and confidence arranging their finances are more likely to know they can apply for statutory hardship and more likely to be granted it. This idea was supported by conversations with subject matter experts.

Subject matter experts also pointed out that applications for statutory hardship tend to occur more with banks than other lenders, and that customers of non-bank lenders may avoid hardship applications out of fear it will affect their credit score and future access to credit. It was also pointed out that hardship support rules may encourage some people to accrue debts: Several forms of government support are asset tested and people at risk of having key items repossessed (such as a washing machine) may qualify for additional emergency support. Hence for some people, accruing unsustainable debt may be a logical choice in the short term.

Debt varies with deprivation

The New Zealand Index of Deprivation is an area-based measure of socioeconomic deprivation. Based on nine Census variables, it groups small geographic areas (meshblocks) into ten categories ranging from Decile 1 (least deprived) to Decile 10 (most deprived). Given the relationship between debt and income, and between income and deprivation, we should expect to observe variation in debt by deprivation.

Examining the relationship between deprivation and debt shows that in post codes with higher deprivation:

- fine debt to MoJ, debt to MSD, child support debt to IR is much more common
- buy-now pay-later, secured loan, and unsecured loan debt is much more common
- credit cards and mortgage debt are much less common

These results suggest that the clusters identified when looking at public and private debt also overlap with high deprivation: The first four types of public debt and the first three types of private debt tend to be owed by the kinds of people who are more likely to live in deprived areas.

For simplicity, consider deprivation 8, 9, and 10 to be high deprivation. Using this simplification, we focus on two groups of post codes: Those that contain no high deprivation areas (433 post code areas) and those that only contain high deprivation areas (66 post code areas).

Table 6: Occurrence of debt types by prevalence and deprivation

Percent of resident adults with the following debt types...	... in the 10 post codes where debt type is least common	... in the 10 post codes where debt type is most common	... in the post codes where no area has high deprivation	... in the post codes where all areas have high deprivation
Fine debt to MoJ	1%	22%	4%	16%
Debt to MSD	1%	40%	5%	28%
Liable parent child support debt to IR	<1%	7%	1%	5%
Working for Families debt to IR	<1%	4%	1%	2%
Income tax debt to IR	1%	10%	5%	6%
Overdue student loan debt to IR	<1%	4%	1%	2%
Buy-now pay-later	1%	22%	9%	16%
Secured loan	<1%	11%	2%	4%
Unsecured loan	1%	18%	5%	13%
Credit card	18%	80%	64%	36%
Mortgage	5%	57%	34%	18%

Table 6 gives the prevalence of each type of debt. It does this first by the prevalence of each debt type (as per Figure 1), and second by the prevalence of high deprivation areas within the post code. These results show a strong link between deprivation and different types of debt, and between deprivation and the clusters identified above.

These results are stable over time

The results described above are based on data for September 2020. We repeated the analysis using data from September 2018 with very similar results. In both cases, September was chosen as it is a relatively stable month without winter heating or summer holiday spending.

Table 7 gives the percent of New Zealand residents aged 19 and over with each debt type in 2018 and 2020. The numbers in the 2020 column are identical to those reported above in Table 1 and Table 2.

Table 7: Changes in debt type prevalence 2018 to 2020

Debt type	Percent of adults in 2018	Percent of adults in 2020
Fine debt to MoJ	7%	7%
Debt to MSD	10%	11%
Liabile parent child support debt to IR	2%	2%
Working for Families debt to IR	1%	1%
Income tax debt to IR	2%	4%
Overdue student loan debt to IR	2%	1%
Buy-now pay-later	6%	12%
Secured loan	3%	3%
Unsecured loan	9%	8%
Credit card	60%	56%
Mortgage	29%	29%

Two changes between 2018 and 2020 stand out when looking at Table 7: the percent of resident adults with buy-now pay-later debt and with income tax debt double between these two years. This is expected for buy-now pay-later debt, which is known to be a new and fast-growing credit alternative.⁵

The change for income tax debt was less expected. Of all the debt types, only income tax shows notable differences in its associations with other types of debt between 2018 and 2020:

- Table 3 shows that in 2020, income tax has a slight positive association with the other types of public debt. But in 2018, income tax has a slight negative association with all the other types of public debt.

⁵ Ministry of Business, Innovation & Employment 2021. Summary document: Buy-Now Pay-Later. Available from <https://www.mbie.govt.nz/have-your-say/bnpl/>

- Figure 2 shows that in 2020, income tax has only small associations with all the private debt types. But in 2018, income tax has a clear negative association with the first cluster of private debt types and a clear positive association with the second cluster of private debt types.
- Figure 4 shows that in 2020, income tax has a positive association with all three types of hardship. But in 2018, income tax had minimal association with late payment or hardship and has a significant negative association with being in default.

Taken together, these changes suggest that in 2018 income tax tended to be owed by the kind of people who owed credit card or mortgage debt, and not owed by the kind of people who owed other types of public debt or the first three types of private debt (buy-now pay-later, secured loan, and unsecured loan debt). This changes by 2020 as it becomes more common for income tax debt to be owed by both kinds of people.

Consider these limitations

The data available for this analysis and decisions made during the course of it, mean that our results are suited for some purposes but not for others. The key limitations are:

- We use data summarised at post code level, not individual level data. So, while it is reasonable to expect the patterns observed in this research to play out at an individual level, our results only describe groups of people.
- Our analysis is based on relationships between pairs of debt types. As a result, only the most obvious clusters are observed. Different techniques might be able to identify other clusters and there will more nuanced clusters at an individual level than we can observe here.
- Certain debt types interact with household composition, so the patterns at a household level may differ from those shown here. For example, people who owe income tax debt may live alone or with others, but people who owe WFF overpayment debt are very likely to live with a partner.
- We do not observe all private debt. Some buy-now pay-later providers are not included in Centrix data. Data on some types of debt are unavailable. For example, rent arrears.

Results have been shared with agencies

This research showed how different types of debt – public and private – cluster together. Many of these patterns were as expected based on anecdotal and experiential evidence. But this is the first time quantitative evidence of this nature has been available at a national level. Results from this work have been presented to the Social Wellbeing Board as well as the government agencies who debt was analysed here – MSD, MoJ, and IR – to inform their ongoing policy and debt management work.