

# Debt, Financial Vulnerability, and Repayment Behaviour in Older Canadian Households

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## Abstract

Earlier research has documented that debt at older ages has increased significantly in Canada over the period from 1999 to 2016. In this article we explore the consequences of a growing proportion of older Canadian households experiencing financial vulnerability. After controlling for household characteristics, we find among older households that a high debt-to-asset ratio and very low liquid wealth are significantly and positively associated with skipping or delaying a mortgage or non-mortgage debt payment and with usually paying the minimum amount or less on credit cards in the previous year. The debt-to-income ratio, however, is not an important indicator of financial vulnerability for older households.

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# 1 Introduction

Total household debt in Canada has skyrocketed over the past two decades. It increased from 575 billion dollars in the first quarter of 1999 to 2.31 trillion dollars in 2019 (as of Q4 of 2019).<sup>1</sup> Over the same period, the aggregate household debt-to-disposable income ratio increased from 107% to 176%, and the household debt-to-GDP ratio grew from 61% to 101%. The rising household indebtedness has attracted much attention in recent years, and there are significant concerns regarding the implications of household debt for the Canadian economy and financial system. For example, the Bank of Canada has identified elevated household indebtedness as one of the key vulnerabilities in the Canadian financial system,<sup>2</sup> and the federal government has tightened the mortgage rules several times over the past decade.

Since debt and income are not uniformly distributed across households, aggregate measures of household indebtedness can mask important information about households that hold more debt and their ability to repay that debt. Thus, it is important to go beyond aggregate statistics to examine household level micro data. Two recent papers have done this. Using the Survey of Financial Security (SFS), a cross-sectional survey conducted by Statistics Canada, Uppal (2019) examined changes in debt and assets among senior Canadian families (major income earner was 65 or above) and found that the median debt-to-income ratio for senior families with debt more than doubled over the period from 1999 to 2016, while the median debt-to-asset ratio increased much less. Bédard and Michaud (2021) analyzed two older age groups, the 56–61 years old and the 62–66 years old. They showed that debt as a ratio of income rose considerably over the period 1999–2016 and the average debt-to-asset ratio almost doubled for the two groups of households. The authors also conducted two stress tests and found a small but significant fraction of households were vulnerable to a sudden rise in borrowing costs or a meltdown of house prices.<sup>3</sup>

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<sup>1</sup>Mortgage debt accounts for about two thirds of total household debt in Canada.

<sup>2</sup>See the Bank of Canada's Financial System Review in recent years ([https://www.bankofcanada.ca/publications/browse/?content\\_type%5B%5D=542](https://www.bankofcanada.ca/publications/browse/?content_type%5B%5D=542)).

<sup>3</sup>Using micro data, a number of other studies have investigated changes in debt, assets, and net worth among Canadian households (Cateau, Roberts, and Zhou (2015); Uppal and LaRochelle-Côté (2015); Roth-

Like these papers, we also use four waves of the SFS to examine the evolution of Canadian household debt from 1999 to 2016. We contribute to the literature with new empirical analysis of debt management among older Canadian households (i.e., those in which the major income earner was aged 55–74 years). In particular, we explore the consequences of debt by studying household debt payment and credit card payment behavior and examine the role of debt on the financial vulnerability of older Canadian households.

To this end, we first documented the trends in debt among Canadian households. Similar to Uppal (2019) and Bédard and Michaud (2021), we found a large increase in the incidence and the level of debt among older households from 1999 to 2016. We also found that older households’ share of total household debt increased remarkably.<sup>4</sup>

We then focused our study on older households and evaluated whether the debt left them vulnerable. We constructed three financial vulnerability indicators, and each indicator provided insight into the financial abilities of these older households to cover their debt. These indicators included the debt-to-income (D/I) ratio, the debt-to-asset (D/A) ratio, and the level of liquid wealth.<sup>5</sup> Among indebted households, we defined vulnerable households as those with a high D/I ratio ( $D/I \geq 4.5$ ), a high D/A ratio ( $D/A \geq 0.75$ ), or very low liquid wealth (“liquid” < \$250 in 2016 dollars). We found that since 1999 older households have become increasingly likely to be financially vulnerable. For example, 11.7% of all households in the age group of 55–64 years were vulnerable households in 1999, and this well and Robson (2018); Marshall (2019)). Research in the United States also suggests that an increasing number of people are now struggling with debt, as both the incidence of debt and debt levels have risen for older Americans (Copeland (2015); Lusardi, Mitchell, and Oggero (2018); Brown, Lee, Scally, and van der Klaauw (2019); Lusardi, Mitchell, and Oggero (2020)).

<sup>4</sup>For instance, the share of total household debt held by households in the age group of 55–64 years doubled, rising from 9.0% in 1999 to 18.5% in 2016.

<sup>5</sup>The D/I ratio and the D/A ratio are two common measures of household indebtedness and are used by Uppal (2019) and Bédard and Michaud (2021). We include an additional measure, the level of liquid wealth as it reflects a household’s ability to cover its debt even if the household has no or limit income to make debt payments. Liquid wealth refers to financial assets in non-registered accounts, such as deposits in checking accounts, savings accounts, term deposits, treasury bills, bonds, stocks, mutual funds, and other investments. Another interesting measure might be the ratio of total debt payment to disposable income, but this cannot be calculated in the SFS data.

proportion increased to 17.3% in 2016.

Finally, we examined the consequences of debt in older households. The 2016 SFS asked a number of questions about financial security that previous iterations of the survey did not. Using the 2016 SFS, we found that vulnerable households were significantly more likely to skip or delay a debt payment (mortgage or non-mortgage) than were other indebted households in the same age group. For instance, among all indebted households that had a mortgage on the principal residence in the age group of 55–64 years, 6.2% skipped or delayed a mortgage payment in the last 12 months. However, the proportion of vulnerable households in the age group that skipped or delayed a mortgage payment in the past year was almost four times that of other indebted households in the same age group (14.1% versus 3.6%). Regarding credit card payments, a sizeable proportion (17.0%) of vulnerable households in the age group of 55–64 years usually paid the minimum amount or less on their credit cards in the previous year, while the proportion was much smaller (4.3%) in other indebted households in the same age group. We observed similar patterns in the age group of 65–74 years. These results suggested that vulnerable households were more likely to have trouble managing their debt.

While these observations regarding debt payments provided a useful picture of the exposure of older Canadian households to debt, they were obtained without referring to debt holders' socioeconomic and demographic characteristics. Thus, we used a probit model to investigate the relationship between debt payment outcomes and financial vulnerability indicators by including the rich set of controls in the 2016 SFS. The outcomes considered in this paper were the following: (1) skipped or delayed a mortgage payment in the previous year; (2) skipped or delayed a non-mortgage payment due to financial difficulties in the previous year; and (3) usually paid the minimum amount or less on credit cards in the previous year.

We found that being a vulnerable household was significantly associated with all three outcomes. Among the three financial vulnerability indicators, a high D/A ratio and a very low level of liquid wealth had a significant and positive association with the probability that an indebted older household skipped or delayed a debt payment in the previous year

(outcomes 1 and 2), while the effect of a high D/I ratio was smaller and not statistically significant.<sup>6</sup> A high D/A ratio and very low liquid wealth were also significantly associated with the probability that an indebted older household usually paid the minimum amount or less on its credit cards (outcome 3). Thus, a high D/A ratio and very low liquid wealth are important indicators of financial vulnerability for older households. The D/I ratio, however, is not a predictive indicator of financial vulnerability for older households.

The remainder of this paper is organized as follows. Section 2 describes the data and provides evidence about the trends in debt among older Canadian households. Section 3 constructs three financial vulnerability indicators. Section 4 reports the consequences of debt in older households. Section 5 discusses policy implications and concludes the paper.

## 2 Household Debt in Survey of Financial Security

The dataset used in this paper is the public-use micro data from the Survey of Financial Security (SFS).<sup>7</sup> The SFS gathers information on demographics, income, assets, debts, and financial behavior and attitudes from a sample of Canadian families. Its target population represents approximately 98% of the population in Canada. We use all four waves of the SFS, which were conducted in 1999, 2005, 2012 and 2016, available at the time this paper was written.<sup>8</sup>

Previous studies have shown that both debt and assets of Canadian households recorded significant gains between 1999 and 2016 (Uppal and LaRochelle-Côté (2015); Uppal (2019)). We found similar results. For indebted households in Canada, the median debt level grew from \$39,940 in 1999 to \$81,500 in 2016 (all values in this paper are in 2016 Canadian dollars). The average household debt also more than doubled, rising from \$73,145 in 1999 to \$161,792 in 2016. Matching the increase in household debt, the median and mean levels of total assets also doubled for indebted households over the same period. For instance, the

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<sup>6</sup>We are interested in the relationship between debt payment outcomes and financial vulnerability indicators. The word “effect” is not intended to imply causality.

<sup>7</sup>See more information about the survey in Appendix A.

<sup>8</sup>The data file includes 15933, 5267, 12003 and 12429 sample households in 1999, 2005, 2012 and 2016, respectively. Sample weights are used.

median total assets grew from \$240,330 in 1999 to \$492,750 in 2016.

The simultaneous increase in household debt and assets may suggest that many households used debt to finance their asset purchase (e.g., house or vehicle) or borrowed against their home equity when their house value appreciated. Having a larger balance sheet on both sides (i.e., assets and liabilities) need not be associated with financial difficulties. However, household income did not increase much when debt increased rapidly. Between 1999 and 2016, the median income of indebted households increased by only 15%, rising from \$64,954 to \$75,000, which was much lower than the debt growth rate. Thus, elevated household indebtedness could increase the vulnerability of households to shocks, such as a correction in house prices and/or an increase in interest rates.

How many households in the SFS were in debt? Table 1 showed that the proportion of Canadian households having debt (any type of debt) increased modestly over time, rising from 67.7% in 1999 to 70.5% in 2016. The small increase in the incidence of debt was observed across income groups. Table 1 also reported the incidence of debt across age groups. The proportion of households having debt decreased from 1999 to 2016 in the youngest age group (major income earner was below 35 years), while the incidence of debt in other age groups increased. Among the age groups, perhaps the most notable change over time was the large increase in the incidence of debt among older households (i.e., those in which the major income earner was aged 55 years or above). For example, the proportion of households with debt in the age group of 55–64 years rose from 61.6% in 1999 to 73.5% in 2016. In the age group of 65–74 years, only 35.3% of households had debt in 1999, but more than half of them had debt in 2016.

[Table 1]

Table 2 further showed the share of total household debt by age group from 1999 to 2016. The period saw a declining share of total debt in younger households, while the share of total debt in older households increased significantly. For instance, the share of total household debt held by households in the age group of 35–44 years fell from 35.4% in 1999 to 27.4% in 2016. During the same period, the share of total household debt held by households in the age group of 55–64 years doubled, rising from 9.0% to 18.5%. The share

of total household debt held by households in the age group of 65–74 years also increased significantly from 1999 to 2016.

[Table 2]

It could be argued that the reason for the rising share of total household debt in older households is that there are more older households, and their share of the population has increased over time. Indeed, baby boomers comprise a large fraction of the population, and many of them are entering the older age groups. In the SFS data, we found that the population share of households with a major income earner aged 55–74 years rose from 22.4% in 1999 to 31.3% in 2016, an increase of 40%. However, this increase in the population share of older households was much smaller than the increase in their share of total household debt, as the share of total household debt held by households in the age group of 55–74 years more than doubled, growing from 11.8% in 1999 to 23.9% in 2016.

Given that there was a large increase in the incidence of debt among older households from 1999 to 2016, and their share of total household debt also increased significantly, we then focused on these older households, particularly those in the age groups 55–64 years and 65–74 years.<sup>9</sup> Table 3 showed the role of categories of debt in these two age groups based on the 1999 and the 2016 SFS.

[Table 3]

The various types of debt owed by older households were classified into four broad categories: (1) mortgage debt; (2) lines of credit; (3) student loans; and (4) other consumer debt, which includes vehicle loans, credit card and installment debt, and other unpaid bills. In the age group of 55–64 years, we found that the proportion of households having each type of debt increased over time. Conditional on having a certain type of debt, the debt level increased significantly from 1999 to 2016. For example, the average mortgage debt grew from \$98,833 in 1999 to \$211,303 in 2016. The results in the age group of 55–64 years also held for the age group of 65–74 years.

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<sup>9</sup>We ignored households in the age group 75 and above as their share of total household debt was very small, only 1.7% in 2016.

### 3 Financial Vulnerability Indicators

So far we have documented the large increase in the incidence and level of debt, as well as the share of total household debt in older households. The debt increase made these households' balance sheets more sensitive to various shocks (e.g., interest rate hikes, asset price fluctuations and a large health event) and could turn some of them into the situation of financial fragility. In this section, we evaluated whether debt made older households vulnerable. As has been mentioned, we constructed three financial vulnerability indicators including the debt to total income (D/I) ratio, the debt to total asset (D/A) ratio, and the level of liquid wealth ("liquid").

For each indicator, we used a few thresholds and divided households into different brackets. For example, there were four brackets for the D/I ratio: 0.0–1.0, 1.0–3.0, 3.0–4.5, and 4.5 and above.<sup>10</sup> Among indebted households, we defined vulnerable households as those that had a debt-to-income ratio of at least 4.5, a debt-to-asset ratio of at least 0.75, or liquid wealth less than \$250 (in 2016 dollars). These thresholds were chosen to identify a small but significant fraction of households that could be vulnerable. The threshold of 4.5 for the D/I ratio is consistent with the definition of highly indebted households used by the Bank of Canada. Moreover, we expected that older households had paid back most of their debt and accumulated a reasonable amount of liquid wealth. A debt-to-asset ratio of at least 0.75 or very low liquid wealth ("liquid" < \$250) would make them more likely to face problems in debt management.

#### 3.1 Vulnerable households

How many indebted older households were vulnerable? Using the 1999 and the 2016 SFS, Table 4 showed the fraction of vulnerable households in the age groups 55–64 years and 65–74 years and the share of debt held by vulnerable households in these two age groups.<sup>11</sup>

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<sup>10</sup>There were four brackets for the D/A ratio: 0.00–0.25, 0.25–0.50, 0.50–0.75, and 0.75 and above. Similarly, four groups of households were constructed for the level of liquid wealth: less than \$250, \$250 and up to \$1,000, \$1,000 and up to \$2,500, and \$2,500 and above.

<sup>11</sup>The distribution of vulnerable households by province in the two age groups roughly matched the population shares by province. Most of the vulnerable households were located in Ontario, Quebec, and



[Table 4]

Older households have become increasingly likely to be financially vulnerable since 1999. In the age group of 55–64 years, the fraction of vulnerable households among all households increased from 11.7% in 1999 to 17.3% in 2016, representing a weighted count of about 490,000 vulnerable households in the age group in 2016. The fraction of vulnerable households among indebted households increased from 19.0% in 1999 to 23.6% in 2016. The change in the share of total debt of the age group held by vulnerable households was more dramatic, rising from 19.4% in 1999 to 39.0% in 2016. Among the three vulnerability indicators, we noted that the increase in vulnerable households was mainly driven by a sharp increase in the fraction of indebted households with a very high D/I ratio ( $D/I \geq 4.5$ ), which grew from 3.0% of indebted households (1.9% of all households) in 1999 to 10.0% of indebted households (7.3% of all households) in 2016. The proportion of indebted households with a very high D/A ratio ( $D/A \geq 0.75$ ) in the age group of 55–64 years also increased over time, while the proportion of indebted households with very low liquid wealth (“liquid” < \$250) decreased. However, the prevalence of indebted households with very low liquid wealth was still striking because 13.1% of indebted households (9.6% of all households) in the age group of 55–64 years had less than \$250 in liquid wealth in 2016.

Regarding the age group of 65–74 years, the fraction of vulnerable households among all households increased from 7.2% in 1999 to 10.1% in 2016, representing a weighted count of about 200,000 vulnerable households in this age group in 2016. The fraction of vulnerable households among indebted households decreased slightly (from 20.3% in 1999 to 18.8% in 2016). The share of total debt of the age group held by vulnerable households nonetheless increased, rising from 32.4% in 1999 to 36.0% in 2016.

## 4 Consequences of Debt in Older Households

The large increase in the incidence of debt and the level of debt in older households raises a serious question regarding whether these households can service their debt. We now turn

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British Columbia.

to the consequences of debt in older households and present evidence on the significantly different payment patterns for vulnerable households and other indebted households.

#### 4.1 Payment patterns

The 2016 SFS asked a few questions about household behavior regarding their mortgage payments, non-mortgage payments, and their credit card payments. Specifically, the survey asked:

(1) “In the last 12 months, have you skipped or delayed a mortgage payment on this (primary residence) property?” A respondent chose *Yes* or *No* to this question.

(2) “In the last 12 months, have you skipped or delayed a non-mortgage payment?” If the answer was *Yes*, the survey further asked: “In the last 12 months, have you skipped or delayed a non-mortgage payment due to financial difficulties?” Because it is likely that some households may forget to make a non-mortgage payment even if they face no financial problems, in this study we focused on households that skipped or delayed a non-mortgage payment in the last 12 months because of financial difficulties.

(3) “Over the last 12 months, on your credit cards, what did you usually pay?” The respondent could choose among the following answers: less than the minimum amount, the minimum amount, more than minimum amount but less than the full amount, and the full amount.

Table 5 compared the mortgage and non-mortgage payments between vulnerable households and other indebted households in the age groups 55–64 years and 65–74 years.<sup>12</sup> The key finding was that vulnerable households were significantly more likely to skip or delay a debt payment (mortgage or non-mortgage) than other indebted households were. Panel A in the table reported the fraction of households that skipped or delayed a mortgage payment in the last 12 months conditional on having a mortgage on their principal residences. Among all indebted households in the age group of 55–64 years, 6.2% skipped or delayed a mortgage payment in the last 12 months. The proportion of vulnerable households that skipped or

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<sup>12</sup>Appendix B further compared the debt payment patterns between indebted households with a high D/I ratio (a high D/A ratio or very low liquid wealth) and other indebted households.

delayed a mortgage payment in the past year was almost four times that of other indebted households (14.1% versus 3.6%). We observed a similar pattern for the age group of 65–74 years. Panel B in the table reported the fraction of households that skipped or delayed a non-mortgage payment because of financial difficulty in the last 12 months conditional on having a non-mortgage debt. Again, vulnerable households were significantly more likely than other indebted households in the same age group to skip or delay a non-mortgage payment in the last 12 months.

[Table 5]

Figure 1 below showed the pattern of credit card payments by indebted older households with a credit card. We distinguished vulnerable households from other indebted households. We found that a significant portion of vulnerable households usually paid the minimum amount or less on their credit cards. For example, in the age group of 55–64 years, 13.6% of vulnerable households usually paid the minimum amount in the previous year on their credit cards, and 3.4% usually paid less than the minimum amount. Because of the well-known high interest charges on credit card balances, paying the minimum amount or less on credit cards indicates that these households were having trouble managing their debt. Regarding other indebted households, a much smaller fraction (4.3%) usually paid the minimum amount or less on their credit cards, and the majority usually paid their credit cards in full.

[Figure 1]

So far we have presented evidence on older households' debt payment and credit card payment behavior using the 2016 SFS. Ideally, we would like to have compared the payment behavior in 2016 with that in previous surveys to identify the changing patterns over time. Unfortunately, we were not able to compare household mortgage and non-mortgage debt payments with those in previous surveys because the survey questions were changed in 2016. For example, the 1999 SFS included a question about household debt payment behavior, but it asked whether a household was ever behind two months or more in a bill or any debt in 1998. However, previous SFSs asked about household credit card payment behavior

although the responses were not as detailed as in the 2016 SFS. Specifically, the 1999 SFS asked: “Do you usually pay off credit card balances each month?” The respondents chose *Yes* or *No*. Thus, we were able to compute the fraction of indebted households that usually paid less than the full amount across the surveys.

Regarding indebted older households with a credit card, we found that the proportion of these households that usually paid less than the full amount on their credit cards had increased over time. In the age group of 55–64 years, 35.7% of them usually paid less than the full amount in 1999, and the proportion grew to 41.3% in 2016. The increase was mainly driven by the vulnerable households, in which the proportion that usually paid less than the full amount on their credit cards increased from 44.5% in 1999 to 59.5% in 2016. In the age group of 65–74 years, the proportion of indebted households that usually paid less than the full amount increased modestly, rising from 32.6% in 1999 to 35.4% in 2016.

Although the observations regarding debt payments provided a useful picture of the exposure of older Canadian households to debt, further analysis was required to determine the socioeconomic and demographic factors associated with the likelihood of missing/delaying a debt payment or usually paying the minimum amount or less on credit cards, which was the focus of the rest of the paper.

## 4.2 Probit model

We applied a probit model to investigate the relationships between the consequences of debt and the socioeconomic and demographic factors. The dependent variable is one of the three outcomes: (1) skipped or delayed a mortgage payment in the previous year; (2) skipped or delayed a non-mortgage payment because of financial difficulties in the previous year; and (3) usually paid the minimum amount or less on credit cards in the previous year. We included the following household characteristics available in the survey as explanatory variables: age, gender, education, family type (lone parent, couple, detached individuals), family size (the number of persons in the household), region, whether having a business, whether worked for pay in the previous year (employment status), total income, and whether

having a family budget.<sup>13</sup> The variables of age, gender, and education referred to the major income earner in a family unit. Other variables referred to the households in their entirety.

Using the probit model, we estimated three sets of regressions to explain the three outcomes. We focused on indebted households in the age group of 55–64 years because it registered a large increase in the share of total household debt (Table 2) and a growing proportion of indebted households in the age group became vulnerable (Table 4). We used the 2016 survey to conduct the analysis.

#### 4.2.1 Skipped or delayed a mortgage payment

In the first set of regressions, there were five specifications of the probit model. In all the specifications, the dependent variable was used to measure whether an indebted household skipped or delayed a mortgage payment in the last 12 months. The independent variables in each specification included household characteristics mentioned above. In addition, in the first specification, we included the vulnerable household indicator as an independent variable to examine its relationship with the dependent variable. Recall that we defined a vulnerable household as one with a high debt-to-income ratio ( $D/I \geq 4.5$ ), a high debt-to-asset ratio ( $D/A \geq 0.75$ ), or very low liquid wealth (“liquid”  $< \$250$ ). To distinguish the relationships between each of the three financial vulnerability indicators and the dependent variable, we included the categories of D/I ratio, D/A ratio, and “liquid” in specifications 2–4, respectively. Finally, we included all three vulnerability indicators in specification 5 to identify the most important indicator(s) associated with the outcome.<sup>14</sup> The sample in the first set of regressions included all indebted households in the age group of 55–64 years

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<sup>13</sup>Using disposable income instead of total income yields similar results.

<sup>14</sup>One caveat of the model is the endogeneity concern. It is possible that some of our independent variables (e.g., financial vulnerability indicators) are endogenously related to the dependent variable. For example, unobservable third factors such as preferences might both affect the debt-to-income ratio and the debt repayment behavior. One common strategy used to address this issue is to apply the method of instrumental variables. Unfortunately, there are not likely instruments to estimate such models. Moreover, the cross-sectional nature of our data does not allow us to mitigate this endogeneity concern by applying techniques such as fixed effects models that control for endogeneity from individual-specific time-invariant unobservable factors.

that had a mortgage on their principal residences.

Table 6 presented the average marginal effects on the estimated probability that an indebted household skipped or delayed a mortgage payment in the previous year for the first set of regressions.<sup>15</sup> Column 1 reported the results of the first specification, in which the independent variables included the vulnerable household indicator. There was a significant and positive association between the vulnerable household indicator and the dependent variable. After we controlled for other household characteristics, being a vulnerable household was associated with an increase of the probability of skipping or delaying a mortgage payment in the previous year by 7.5 percentage points, which was statistically significant at the 1-percent level.

[Table 6]

Columns 2–4 of Table 6 presented the results of specifications 2–4. We found that when only one of the three financial vulnerability indicators was included in the regression, each of them was significantly associated with the probability that an indebted household skipped or delayed a mortgage payment in the previous year.

Finally, Column 5 of Table 6 reported the results of the fifth specification in which the independent variables included dummies of all three financial vulnerability indicators. After controlling for other household characteristics, we found that the effects of a high D/A ratio ( $D/A \geq 0.75$ ) and very low liquid wealth (“liquid” < \$250) were still statistically significant at the 1-percent level and the magnitudes were large, while the effects of the D/I ratios were smaller and not statistically significant. The finding that the D/I ratio is not associated with the outcome was somewhat surprising because the D/I ratio is a widely used financial vulnerability indicator. Thus, among the three financial vulnerability indicators, only the high D/A ratio and very low liquid wealth were significantly associated with the probability that an indebted older household skipped or delayed a mortgage payment in the previous

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<sup>15</sup>Following Brunnermeier and Nagel (2008), we do not use sample weights in the regressions. However, all marginal effects reported in the paper are weighted (by using the survey weights) even if the coefficients are estimated using unweighted data. Appendix C shows that weighted regressions produce similar results as in unweighted regressions for the key variables (e.g., vulnerability indicator) that we are interested in.

year. There was no significant relationship between other household characteristics and the dependent variable.

#### **4.2.2 Skipped or delayed a non-mortgage payment**

In the second set of regressions, there were also five specifications of the probit model, but the dependent variable was used to measure whether an indebted household skipped or delayed a non-mortgage payment in the last 12 months because of financial difficulties. The sample included all indebted households in the age group of 55–64 years that had a non-mortgage debt. Table 7 summarized the results.

[Table 7]

Regarding the vulnerable household indicator and the three financial vulnerability indicators, the main results were similar to those of the first set of regressions. After we controlled for other household characteristics, being a vulnerable household was associated with an increase in the probability of skipping or delaying a non-mortgage payment in the previous year because of financial difficulties by 6.8 percentage points, which was statistically significant at the 1-percent level. Among the three financial vulnerability indicators, a high D/A ratio and low liquid wealth were significantly associated with the probability that an indebted household skipped or delayed a non-mortgage payment. In the fifth specification (Table 7, column 5), in which the independent variables included all three financial vulnerability indicators, the probability that an indebted household skipped or delayed a non-mortgage payment in the previous year because of financial difficulties was 9.1 percentage points higher for indebted households with liquid wealth less than \$250 than for those with liquid wealth of at least \$2,500 (the omitted group). The results also indicated that the D/I ratios were not significantly associated with the probability that an indebted household skipped or delayed a non-mortgage payment because of financial difficulties. This was the case when the D/I ratios were included separately in a regression (column 2) or when they were included in the same regression together with the D/A ratios and the levels of liquid wealth (column 5).

Unlike the first set of regressions, in which income level was not significantly associated with the probability that an indebted household skipped or delayed a mortgage payment, we found that a higher income level was associated with a lower probability that an indebted household skipped or delayed a non-mortgage payment because of financial difficulties. This was the case across the five specifications as shown in Table 7. Moreover, age was negatively related to the probability of skipping or delaying a non-mortgage payment because of financial difficulties. Indebted households where the major income earner was male were more likely to skip or delay a non-mortgage payment because of financial difficulties than those where the major income earner was female.

### **4.2.3 Usually paid the minimum amount or less on credit cards**

In the third set of regressions, we examined which household characteristics were associated with a household’s credit card payment behavior. The dependent variable was used to measure whether a household usually paid the minimum amount or less on its credit cards in the last 12 months. Again, there were five specifications in the probit model. The sample included all indebted households in the age group of 55–64 years having a credit card. Table 8 presented the marginal effects of the independent variables in the regressions.

[Table 8]

There were several observations. First, being a vulnerable household had a significant and positive association with the probability that the household usually paid the minimum amount or less on its credit cards in the previous year (column 1). Second, regarding the three financial vulnerability indicators (i.e., D/I ratio, D/A ratio, and liquid wealth), when they were included separately in the regressions (columns 2, 3, and 4), a high D/I ratio, a high D/A ratio and very low liquid wealth all had a significant association with the dependent variable. When they were included in a single regression (column 5), a high D/A ratio (i.e.,  $D/A \text{ ratio} \geq 0.75$ ) and very low liquid wealth (i.e., “liquid”  $< \$250$ ) still had a large and significant association with the dependent variable. However, the relationship between a high D/I ratio (i.e.,  $D/I \text{ ratio} \geq 4.5$ ) and the dependent variable



became much weaker and was statistically significant only at the 10-percent level. Third, higher education (i.e., university degree) was associated with a lower probability that an indebted older household usually paid the minimum amount or less on its credit cards, while lower education (i.e., less than high school) was associated with a higher probability of doing so. This finding differed from the first two sets of regressions, where the results indicated that education status was not associated with the probability that a household skipped or delayed a mortgage/non-mortgage payment in the previous year. Fourth, unattached households or households with a larger family size were more likely to usually pay the minimum amount or less on their credit cards. Finally, it was interesting to note that indebted households in British Columbia were less likely to usually pay the minimum amount or less on their credit cards than their counterparts in Ontario (i.e., the omitted province).

## 5 Discussion and Conclusions

Also using the Survey of Financial Security from 1999 to 2016, we confirm the findings of Uppal (2019) and Bédard and Michaud (2021) that older Canadian households were increasingly more likely to have debt than before and they were holding higher levels of debt. Older households' share of total household debt also rose markedly from 1999 to 2016. The rise in debt at older ages may be normal for some households in view of the changing environment such as declining borrowing costs and increase in the retirement age. However, the greater indebtedness of older households makes their balance sheets more sensitive to various shocks and could turn some of them into the situation of financial fragility.

Our analysis examines the role of debt on the financial vulnerability of older Canadian households and focuses on debt repayment. To do this, we define vulnerable households as indebted households with a high debt-to-income ratio ( $D/I \geq 4.5$ ), a high debt-to-asset ratio ( $D/A \geq 0.75$ ), or very low liquid wealth ("liquid"  $< \$250$ ). We find that since 1999 older Canadian households have become increasingly likely to be financially vulnerable. For example, 11.7% of all households in the age group of 55–64 years were vulnerable households in 1999, and this proportion increased to 17.3% in 2016.

We then study the consequences of debt in older households by examining their debt payment (mortgage or non-mortgage) and credit card payment behavior. We find that a small but significant fraction of older Canadian households faced problems in debt management. We further show that a high debt-to-asset ratio and a low level of liquid wealth had a significant and positive association with the probability that an indebted older household skipped or delayed a debt payment (mortgage or non-mortgage) or usually paid the minimum amount or less on their credit cards in the previous year. The debt-to-income ratio, however, was not significantly associated with the measures of repayment difficulties. Therefore, a high debt-to-asset ratio and very low liquid wealth are important indicators of financial vulnerability for older households, while the debt-to-income ratio is not a predictive indicator of financial vulnerability for older households.

Older households comprise a growing fraction of the Canadian population. Higher debt at older ages could have adverse impact on their retirement security. To help improve debt-related outcomes at older ages, researchers and policymakers could do more to explore ways that promote best practices for debt management at old ages. As lack of financial literacy and behavioral biases contribute to the prevalence of debt later in life (Lusardi and Tufano (2015), Hyytinen and Putkuri (2018); Lusardi, Mitchell, and Oggero (2018)), it is clear that older people also require financial knowledge if they are to better manage their debt exposure. Guidance and training programs could be important in enhancing financial literacy and helping improve retirement planning outcomes even at older ages.

Higher incidences and levels of debt at older ages could also affect the labor supply of older adults (i.e., the timing of retirement) and claim decisions regarding public pension benefits. Moreover, the ongoing COVID-19 pandemic may alter the patterns of indebtedness for Canadians including older households. These issues are interesting topics for future research.

## Appendix

### A. Data: Survey of Financial Security

The Survey of Financial Security (SFS) is a cross-sectional survey conducted by Statistics Canada. It collects information on demographics, income, assets, debts, and financial behavior and attitudes from a sample of Canadian families. The SFS covers the population living in all 10 provinces in Canada. Excluded from the survey coverage are persons living on reserves and in other Aboriginal settlements in the provinces, members of religious and other communal colonies, members of the Canadian Forces living on military bases or in military camps, and persons living full time in institutions, such as inmates of penal institutions and chronic care patients living in hospitals and nursing homes. The survey covers about 98% of the population in the 10 provinces. Sample weights are used to represent the entire SFS target population. The SFS was first conducted in 1999. Subsequent iterations of this survey were in 2005, 2012, and 2016. After 2016, Statistics Canada will conduct the survey once every three years.

Families in the SFS refer to the economic family, which is defined as families of two or more people living in the same dwelling, who are related by blood, marriage, or adoption, or who are living common-law, and single people (i.e., unattached individuals).

The total assets of a family are based on several categories: (1) employer pension plans (on a termination basis); (2) financial assets, which include assets held in RRSP, RRIF, and TFSA, stocks, bonds, mutual funds and other investment funds, deposits in financial institutions, and other financial assets; (3) principal residence and other real estate; (4) vehicles; (5) equity in business; and (6) other non-financial assets. The human capital component is excluded in all the surveys and, of course, it is not included in total assets. Also excluded from total assets are the benefits and/or entitlements to future social security provided by the government in the form of the Canada or Quebec Pension Plan or Old Age Security payments.

Total debt includes mortgage debt on the principal residence and all other real estate (Canadian and foreign), personal and home equity lines of credit, student loans, vehicle

loans, credit card and installment debt, and other unpaid bills. Finally, income quintiles are based on the total income of the economic family, including the market income and government transfer.

## **B. Comparison of Debt Payments**

Table B compares the debt payment patterns between indebted households with a high D/I ratio (a high D/A ratio or very low liquid wealth) and other indebted households in the same age group.

## **C. Robustness Check**

*Sampling weights* — We do not use sample weights in our regressions, despite the fact that households have different sampling weights in the SFS. It turns out that we obtain similar results for the key variables we are interested in (e.g., the vulnerability indicator) if we weight households by the SFS sample weights in the regressions, as shown in Table C.

Table C presents the marginal effects of our probit regressions regarding three outcomes. Outcome 1 measures whether a household skipped or delayed a mortgage payment in the last 12 months conditional on having a mortgage on the principal residence. Outcome 2 measures whether a household skipped or delayed a non-mortgage payment because of financial difficulties in the last 12 months conditional on having a non-mortgage debt. Outcome 3 measures whether a household usually paid the minimum amount or less on its credit cards in the last 12 months conditional on being indebted and having a credit card. Columns one, three, and five report the results of our regressions without using sample weights (i.e., the results of column 1 in Tables 6, 7, and 8 of the paper), while columns two, four, and six show the results using the SFS weights.

Table B. Consequences of household indebtedness

<b>Panel A: skipped or delayed a mortgage payment</b>			
	Indebted HHs	Other indebted HHs	All indebted HHs
	with $D/I \geq 4.5$		
Age group 55–64	0.087	0.057	0.062
Age group 65–74	0.051	0.026	0.030
	Indebted HHs	Other indebted HHs	All indebted HHs
	with $D/A \geq 0.75$		
Age group 55–64	0.301	0.055	0.062
Age group 65–74	0.175	0.026	0.030
	Indebted HHs	Other indebted HHs	All indebted HHs
	with “liquid” < \$250		
Age group 55–64	0.242	0.044	0.062
Age group 65–74	0.106	0.019	0.030
<b>Panel B: skipped or delayed a non-mortgage payment</b>			
	Indebted HHs	Other indebted HHs	All indebted HHs
	with $D/I \geq 4.5$		
Age group 55–64	0.095	0.051	0.055
Age group 65–74	0.108	0.022	0.027
	Indebted HHs	Other indebted HHs	All indebted HHs
	with $D/A \geq 0.75$		
Age group 55–64	0.152	0.048	0.055
Age group 65–74	0.255	0.013	0.027
	Indebted HHs	Other indebted HHs	All indebted HHs
	with “liquid” < \$250		
Age group 55–64	0.149	0.039	0.055
Age group 65–74	0.115	0.014	0.027

Notes: This table shows the consequences of household indebtedness using the 2016 SFS. We distinguish indebted households with  $D/I \geq 4.5$ ,  $D/A \geq 0.75$ , or “liquid” < \$250 from other indebted households. Panel A reports the fraction of households that skipped or delayed a mortgage payment in the last 12 months conditional on having a mortgage on the principal residence. Panel B reports the fraction of households that skipped or delayed a non-mortgage payment because of financial difficulty in the last 12 months conditional on having a non-mortgage debt.

Table C. Marginal effects from a probit model: with and without sample weights

	Outcome 1		Outcome 2		Outcome 3	
	No weight	Using weight	No weight	Using weight	No weight	Using weight
<b>Vulnerable households</b>	<b>0.0749</b>	<b>0.0823</b>	<b>0.0681</b>	<b>0.0571</b>	<b>0.0934</b>	<b>0.0899</b>
Age	-0.0006	0.0020	-0.0048	-0.0043	-0.0027	-0.0062
Gender: Male	0.0136	0.0035	0.0286	0.0339	-0.0044	0.0118
Education: Less than high school	0.0100	0.0356	-0.0123	0.0003	0.0380	0.0302
Education: Some postsecondary	0.0183	0.0306	0.0102	0.0173	-0.0254	-0.0071
Education: University degree or certificate	-0.0085	-0.0310	-0.0032	-0.0025	-0.0473	-0.0486
Family type: Unattached	0.0403	0.0756	0.0311	0.0305	0.0586	0.0648
Family type: Lone parent	0.0485	0.1049	-0.0121	0.0277	0.0352	0.0336
Family size	0.0167	0.0306	0.0138	0.0202	0.0278	0.0251
Region: Atlantic	0.0289	0.0252	-0.0251	-0.0019	0.0145	0.0082
Region: Quebec	0.0347	0.0360	-0.0030	0.0041	0.0158	0.0147
Region: Prairies	0.0134	-0.0040	-0.0214	-0.0052	-0.0071	0.0218
Region: British Columbia	0.0126	0.0042	-0.0248	-0.0280	-0.0647	-0.0575
Have a business	0.0045	0.0271	-0.0212	0.0052	-0.0251	-0.0379
Worked for pay in 2015	-0.0159	0.0001	0.0027	0.0032	0.0204	0.0292
Ln(total income)	-0.0044	-0.0053	-0.0158	-0.0243	-0.0086	-0.0125
Have a family budget	-0.0152	-0.0140	-0.0030	-0.0016	-0.0051	0.0084
No. of observations	893	999,566	1681	1,843,110	1794	1,957,310
R-squared	0.1181	0.1444	0.1360	0.1315	0.1597	0.1560

Notes: This table shows the results of a probit model, in which the dependent variable is one of three outcomes. Outcome 1 measures whether a household skipped or delayed a mortgage payment in the last 12 months. Outcome 2 measures whether a household skipped or delayed a non-mortgage payment because of financial difficulties in the last 12 months. Outcome 3 measures whether a household usually paid the minimum amount or less on its credit cards in the last 12 months. Sample households are in the age group of 55–64 years in the 2016 Survey of Financial Security. Marginal effects, averaged across households, refer to the changes in the probabilities of each outcome that are associated with the changes in regressors. The regressions control for total income by means of logarithms using the transformation  $y=\ln(x)$  if  $x\geq 1$ ,  $y=-\ln(|x|)$  if  $x\leq -1$ , and  $y=0$  if  $-1<x<1$ .

## References

- BÉDARD, N., AND P.-C. MICHAUD (2021): “Playing with Fire? Household Debt near Retirement in Canada,” *Canadian Public Policy*, 47(1), 56–71.
- BROWN, M., D. LEE, J. SCALLY, AND W. VAN DER KLAUW (2019): “The Graying of American Debt,” Wharton Pension Research Council Working Paper No. 2019-9.
- BRUNNERMEIER, M., AND S. NAGEL (2008): “Do Wealth Fluctuations Generate Time-Varying Risk Aversion? Micro-Evidence on Individuals’ Asset Allocation,” *American Economic Review*, 98(3), 713–736.
- CATEAU, G., T. ROBERTS, AND J. ZHOU (2015): “Indebted Households and Potential Vulnerabilities for the Canadian Financial System: A Microdata Analysis,” *Financial System Review*, Bank of Canada, December: 49–58.
- COPELAND, C. (2015): “Debt of the Elderly and near Elderly, 1992-2013,” *EBRI Notes*, 36(1), 10–22. Washington, D.C., Employee Benefit Research Institute.
- HYYTINEN, A., AND H. PUTKURI (2018): “Household Optimism and Overborrowing,” *Journal of Money, Credit and Banking*, 50(1), 55–76.
- LUSARDI, A., O. MITCHELL, AND N. OGGERO (2018): “Understanding Debt at Older Ages and Its Implications for Retirement Well-being,” Wharton Pension Research Council Working Paper No. 2018-11.
- (2020): “Debt and Financial Vulnerability on the Verge of Retirement,” *Journal of Money, Credit, and Banking*, 52(5), 1005–1034.
- LUSARDI, A., AND P. TUFANO (2015): “Debt Literacy, Financial Experiences, and Overindebtedness,” *Journal of Pension Economics and Finance*, 14(4), 332–368.
- MARSHALL, G. (2019): “Debt and Financial Distress among Canadian Families,” *Insights on Canadian Society*, Statistics Canada, Cat. No. 75-006-X (June).

ROTHWELL, D., AND J. ROBSON (2018): “The Prevalence and Composition of Asset Poverty in Canada: 1999, 2005, and 2012,” *International Journal of Social Welfare*, 27(1), 17–27.

UPPAL, S. (2019): “Debt and Assets among Senior Canadian Families,” *Insights on Canadian Society*, Statistics Canada, Catalogue no. 75-006-X (April).

UPPAL, S., AND S. LAROCHELLE-CÔTÉ (2015): “Changes in Debt and Assets of Canadian Families, 1999 to 2012,” *Insights on Canadian Society*, Statistics Canada, Catalogue No. 75-006-X (April).



Table 1: Incidence of household debt in Canada

	<b>1999</b>	<b>2005</b>	<b>2012</b>	<b>2016</b>	change in 1999–2016
All	0.677	0.694	0.711	0.705	+ 0.028
Income quintile					
1st – lowest	0.473	0.455	0.493	0.479	+ 0.007
2nd	0.585	0.628	0.645	0.631	+ 0.047
3rd	0.709	0.738	0.758	0.736	+ 0.026
4th	0.806	0.810	0.825	0.844	+ 0.038
5th	0.814	0.842	0.836	0.838	+ 0.024
Age group					
< 35	0.800	0.755	0.786	0.769	– 0.031
35–44	0.807	0.842	0.847	0.848	+ 0.041
45–54	0.766	0.787	0.807	0.816	+ 0.050
55–64	0.616	0.678	0.702	0.735	+ <b>0.119</b>
65–74	0.353	0.441	0.557	0.536	+ <b>0.183</b>
≥ 75	0.168	0.212	0.266	0.273	+ 0.105

Note: This table shows the proportion of households having debt in Canada using the 1999 – 2016 Survey of Financial Security.

Table 2: Share of total household debt by age group

	1999	2005	2012	2016	change in 1999–2016
Age group					
< 35	0.272	0.221	0.225	0.211	– 0.061
35–44	0.354	0.362	0.316	0.274	– 0.080
45–54	0.251	0.261	0.243	0.261	+ 0.010
55–64	0.090	0.121	0.154	0.185	+ <b>0.095</b>
65–74	0.028	0.028	0.045	0.054	+ <b>0.026</b>
≥ 75	0.005	0.008	0.014	0.017	+ 0.012

Note: This table shows the share of total household debt by age group using the 1999 – 2016 Survey of Financial Security.

Table 3: Categories of debt in older Canadian households

Panel A: Age group 55–64										
	Mortgage		Line of credit		Student loan		Other consumer debt		Total debt	
	1999	2016	1999	2016	1999	2016	1999	2016	1999	2016
Incidence of debt	0.298	0.408	0.154	0.270	0.043	0.073	0.470	0.564	0.616	0.735
Debt level (\$ mean)	98,833	211,303	22,574	57,399	14,381	20,340	13,050	19,536	60,280	155,218
Debt level (\$ median)	69,100	150,000	12,093	21,000	9,674	15,000	6,634	12,000	27,640	82,000
Panel B: Age group 65–74										
	Mortgage		Line of credit		Student loan		Other consumer debt		Total debt	
	1999	2016	1999	2016	1999	2016	1999	2016	1999	2016
Incidence of debt	0.109	0.193	0.066	0.166	0.016	0.016	0.280	0.404	0.353	0.536
Debt level (\$ mean)	82,908	162,928	24,682	57,001	13,520	22,863	8,686	15,261	37,617	88,416
Debt level (\$ median)	64,954	105,000	7,947	26,000	13,129	16,500	4,146	8,750	11,816	29,250

Note: Using the 1999 and the 2016 Survey of Financial Security, this table shows the proportion of households having each type of debt in the age groups 55–64 years and 65–74 years. It also reports the level of each type of debt conditional on having the debt. Amounts are in 2016 dollars.

Table 4: Vulnerable households

	1999	2016
Panel A: Age group <b>55–64</b>		
Among all households in the age group		
Fraction of indebted households with $D/I \geq 4.50$	0.019	0.073
Fraction of indebted households with $D/A \geq 0.75$	0.022	0.043
Fraction of indebted households with “liquid” < \$250	0.104	0.096
<b>Fraction of vulnerable households</b>	<b>0.117</b>	<b>0.173</b>
Among indebted households in the age group		
Fraction of indebted households with $D/I \geq 4.50$	0.030	0.100
Fraction of indebted households with $D/A \geq 0.75$	0.035	0.059
Fraction of indebted households with “liquid” < \$250	0.169	0.131
<b>Fraction of vulnerable households</b>	<b>0.190</b>	<b>0.236</b>
Share of debt held by indebted households with $D/I \geq 4.50$	0.109	0.322
Share of debt held by indebted households with $D/A \geq 0.75$	0.046	0.046
Share of debt held by indebted households with “liquid” < \$250	0.117	0.079
<b>Share of debt held by vulnerable households</b>	<b>0.194</b>	<b>0.390</b>
Panel B: Age group <b>65–74</b>		
Among all households in the age group		
Fraction of indebted households with $D/I \geq 4.50$	0.011	0.033
Fraction of indebted households with $D/A \geq 0.75$	0.014	0.027
Fraction of indebted households with “liquid” < \$250	0.059	0.062
<b>Fraction of vulnerable households</b>	<b>0.072</b>	<b>0.101</b>
Among indebted households in the age group		
Fraction of indebted households with $D/I \geq 4.50$	0.032	0.062
Fraction of indebted households with $D/A \geq 0.75$	0.040	0.050
Fraction of indebted households with “liquid” < \$250	0.166	0.115
<b>Fraction of vulnerable households</b>	<b>0.203</b>	<b>0.188</b>
Share of debt held by indebted households with $D/I \geq 4.50$	0.198	0.304
Share of debt held by indebted households with $D/A \geq 0.75$	0.045	0.030
Share of debt held by indebted households with “liquid” < \$250	0.139	0.085
<b>Share of debt held by vulnerable households</b>	<b>0.324</b>	<b>0.360</b>

Notes: This table shows the fraction of vulnerable households in the age groups 55–64 years and 65–74 years and their share of total debt in the two age groups using the 1999 and the 2016 Survey of Financial Security. Vulnerable households are defined as indebted households with a high debt-to-income ratio (i.e.,  $D/I \geq 4.5$ ), a high debt-to asset ratio (i.e.,  $D/A \geq 0.75$ ), or very low liquid wealth (i.e., “liquid” < \$250 in 2016 dollars).

Table 5: Consequences of household indebtedness

Panel A: skipped or delayed a mortgage payment			
	<b>Vulnerable HHs</b>	<b>Other indebted HHs</b>	<b>All indebted HHs</b>
Age group 55–64	0.141	0.036	0.062
Age group 65–74	0.063	0.019	0.030

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Panel B: skipped or delayed a non-mortgage payment			
	<b>Vulnerable HHs</b>	<b>Other indebted HHs</b>	<b>All indebted HHs</b>
Age group 55–64	0.126	0.033	0.055
Age group 65–74	0.097	0.011	0.027

Notes: This table shows the consequences of household indebtedness in the age groups 55–64 years and 65–74 years using the 2016 Survey of Financial Security. We distinguish vulnerable households from other indebted households. Panel A reports the fraction of households that skipped or delayed a mortgage payment in the last 12 months conditional on having a mortgage on the principal residence. Panel B reports the fraction of households that skipped or delayed a non-mortgage payment because of financial difficulty in the last 12 months conditional on having a non-mortgage debt.

Table 6: Marginal effects from a probit model: skipped or delayed a mortgage payment

	(1)	(2)	(3)	(4)	(5)
Vulnerable households	0.0749 ***				
D/I ratio: [1.0, 3.0)		0.0259			0.0031
D/I ratio: [3.0, 4.5)		0.0687 **			0.0192
D/I ratio: $\geq 4.5$		0.0491 *			-0.0044
D/A ratio: [0.25, 0.50)			0.0337 *		0.0269
D/A ratio: [0.50, 0.75)			0.0843 ***		0.0574 **
D/A ratio: $\geq 0.75$			0.1254 ***		0.1070 ***
Liquid wealth: < \$250				0.1077 ***	0.0881 ***
Liquid wealth: [\$250, \$1000)				0.0529 **	0.0430 *
Liquid wealth: [\$1000, \$2500)				0.0147	0.0011
Age	-0.0006	-0.0016	-0.0009	-0.0010	-0.0006
Gender: Male	0.0136	0.0068	0.0078	0.0108	0.0131
Education: Less than high school	0.0100	-0.0001	0.0019	0.0014	0.0049
Education: Some postsecondary	0.0183	0.0113	0.0237	0.0184	0.0251
Education: University degree or certificate	-0.0085	-0.0102	0.0008	0.0055	0.0141
Family type: Unattached	0.0403 *	0.0365	0.0333	0.0446 *	0.0343
Family type: Lone parent	0.0485	0.0411	0.0320	0.0546	0.0293
Family size	0.0167 *	0.0140	0.0102	0.0191 **	0.0133
Region: Atlantic	0.0289	0.0461 **	0.0360	0.0152	0.0231
Region: Quebec	0.0347	0.0356	0.0393 *	0.0240	0.0344
Region: Prairies	0.0134	0.0203	0.0151	0.0152	0.0132
Region: British Columbia	0.0126	0.0097	0.0195	0.0150	0.0245
Have a business	0.0045	0.0079	0.0184	0.0168	0.0206
Worked for pay in 2015	-0.0159	-0.0281	-0.0305	-0.0260	-0.0273
Ln(total income)	-0.0044	-0.0049	-0.0056	-0.0057	-0.0052
Have a family budget	-0.0152	-0.0190	-0.0249	-0.0177	-0.0246
No. of observations	893	893	893	893	893
R-squared	0.1181	0.076	0.1320	0.1487	0.2006

Notes: This table shows the results of a probit model, in which the dependent variable measures whether a household skipped or delayed a mortgage payment in the last 12 months conditional on having a mortgage on the principal residence in the age group of 55–64 years using the 2016 Survey of Financial Security. There are five specifications of the probit model. Marginal effects, averaged across households, refer to the changes in the probabilities of skipping or delaying a mortgage payment that are associated with the changes in regressors. The regressions control for total income by means of logarithms using the transformation  $y=\ln(x)$  if  $x\geq 1$ ,  $y=-\ln(|x|)$  if  $x\leq -1$ , and  $y=0$  if  $-1<x<1$ . \*\*\* (\*\*, \*) stands for statistically significant at the 1 (5, 10) percent level.

Table 7: Marginal effects from a probit model: skipped or delayed a non-mortgage payment

	(1)	(2)	(3)	(4)	(5)
Vulnerable households	0.0681 ***				
D/I ratio: [1.0, 3.0)		0.0141			0.0057
D/I ratio: [3.0, 4.5)		0.0198			0.0079
D/I ratio: $\geq 4.5$		0.0298			0.0136
D/A ratio: [0.25, 0.50)			0.0384 **		0.0234
D/A ratio: [0.50, 0.75)			0.0578 ***		0.0233
D/A ratio: $\geq 0.75$			0.0767 ***		0.0405 **
Liquid wealth: < \$250				0.1024 ***	0.0907 ***
Liquid wealth: [\$250, \$1000)				0.0795 ***	0.0729 ***
Liquid wealth: [\$1000, \$2500)				0.0451 **	0.0417 **
Age	-0.0048 **	-0.0059 ***	-0.0051 **	-0.0053 **	-0.0048 **
Gender: Male	0.0286 **	0.0258 **	0.0275 **	0.0293 **	0.0314 **
Education: Less than high school	-0.0123	-0.0103	-0.0141	-0.0197	-0.0188
Education: Some postsecondary	0.0102	0.0053	0.0077	0.0123	0.0130
Education: University degree or certificate	-0.0032	-0.0103	-0.0020	0.0076	0.0089
Family type: Unattached	0.0311 *	0.0423 **	0.0311 *	0.0228	0.0212
Family type: Lone parent	-0.0121	-0.0018	-0.0147	-0.0112	-0.0197
Family size	0.0138 *	0.0129 *	0.0107	0.0128 *	0.0118
Region: Atlantic	-0.0251	-0.0233	-0.0195	-0.0344 *	-0.0296
Region: Quebec	-0.0030	-0.0059	0.0004	-0.0083	-0.0027
Region: Prairies	-0.0214	-0.0185	-0.0136	-0.0172	-0.0151
Region: British Columbia	-0.0248	-0.0225	-0.0178	-0.0260	-0.0236
Have a business	-0.0212	-0.0189	-0.0125	-0.0029	-0.0047
Worked for pay in 2015	0.0027	-0.0097	-0.0102	0.0010	-0.0001
Ln(total income)	-0.0158 ***	-0.0172 ***	-0.0177 ***	-0.0153 ***	-0.0145 ***
Have a family budget	-0.0030	-0.0040	-0.0059	-0.0034	-0.0047
No. of observations	1681	1681	1681	1681	1681
R-squared	0.1360	0.0903	0.1244	0.1705	0.1832

Notes: This table shows the results of a probit model, in which the dependent variable measures whether a household skipped or delayed a non-mortgage payment because of financial difficulties in the last 12 months conditional on having a non-mortgage debt in the age group of 55–64 years using the 2016 Survey of Financial Security. There are five specifications of the probit model. Marginal effects, averaged across households, refer to the changes in the probabilities of skipping or delaying a non-mortgage payment that are associated with the changes in regressors. The regressions control for total income by means of logarithms using the transformation  $y=\ln(x)$  if  $x\geq 1$ ,  $y=-\ln(|x|)$  if  $x\leq -1$ , and  $y=0$  if  $-1<x<1$ . \*\*\* (\*\*, \*) stands for statistically significant at the 1 (5, 10) percent level.

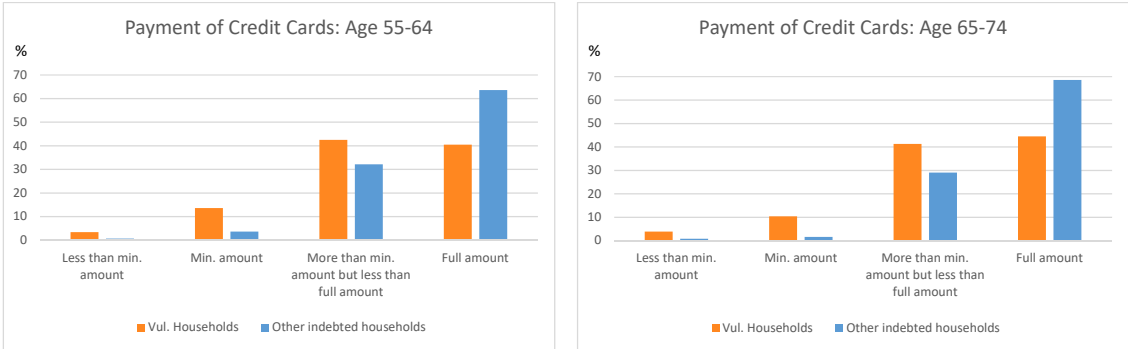
Table 8: Marginal effects from a probit model: usually paid min. amount or less on credit cards

	(1)	(2)	(3)	(4)	(5)
Vulnerable households	0.0934 ***				
D/I ratio: [1.0, 3.0)		0.0049			-0.0071
D/I ratio: [3.0, 4.5)		0.0201			-0.0046
D/I ratio: $\geq 4.5$		0.0643 ***			0.0369 *
D/A ratio: [0.25, 0.50)			0.0421 ***		0.0296 *
D/A ratio: [0.50, 0.75)			0.0818 ***		0.0512 **
D/A ratio: $\geq 0.75$			0.1182 ***		0.0827 ***
Liquid wealth: < \$250				0.1009 ***	0.0816 ***
Liquid wealth: [\$250, \$1000)				0.0368 *	0.0274
Liquid wealth: [\$1000, \$2500)				0.0050	-0.0045
Age	-0.0027	-0.0036	-0.0019	-0.0034	-0.0022
Gender: Male	-0.0044	-0.0095	-0.0124	-0.0081	-0.0064
Education: Less than high school	0.0380 **	0.0445 **	0.0410 **	0.0372 **	0.0361 **
Education: Some postsecondary	-0.0254 *	-0.0264 *	-0.0287 *	-0.0239	-0.0261 *
Education: University degree or certificate	-0.0473 ***	-0.0513 ***	-0.0452 ***	-0.0383 **	-0.0415 **
Family type: Unattached	0.0586 ***	0.0705 ***	0.0557 ***	0.0602 ***	0.0480 **
Family type: Lone parent	0.0352	0.0482	0.0303	0.0592	0.0248
Family size	0.0278 ***	0.0283 ***	0.0245 ***	0.0287 ***	0.0249 ***
Region: Atlantic	0.0145	0.0203	0.0218	0.0042	0.0152
Region: Quebec	0.0158	0.0112	0.0198	0.0070	0.0190
Region: Prairies	-0.0071	-0.0034	-0.0017	-0.0073	-0.0054
Region: British Columbia	-0.0647 **	-0.0642 **	-0.0557 **	-0.0552 **	-0.0598 **
Have a business	-0.0251 *	-0.0267 *	-0.0145	-0.0117	-0.0127
Worked for pay in 2015	0.0204	0.0078	0.0038	0.0133	0.0160
Ln(total income)	-0.0086 *	-0.0090 *	-0.0105 **	-0.0102 **	-0.0064
Have a family budget	-0.0051	-0.0044	-0.0106	-0.0072	-0.0086
No. of observations	1794	1794	1794	1794	1794
R-squared	0.1597	0.1086	0.1440	0.1484	0.1809

Notes: This table shows the results of a probit model, in which the dependent variable measures whether a household usually paid the minimum amount or less on its credit cards in the last 12 months conditional on being indebted and having a credit card in the age group of 55–64 years using the 2016 Survey of Financial Security. There are five specifications of the probit model. Marginal effects, averaged across households, refer to the changes in the probabilities of usually paying the minimum amount or less on credit cards that are associated with the changes in regressors. The regressions control for total income by means of logarithms using the transformation  $y=\ln(x)$  if  $x\geq 1$ ,  $y=-\ln(|x|)$  if  $x\leq -1$ , and  $y=0$  if  $-1<x<1$ . \*\*\* (\*\*, \*) stands for statistically significant at the 1 (5, 10) percent level.



Figure 1: Consequence of household indebtedness: credit card payments



Note: This figure shows the pattern of credit card payments by vulnerable households and other indebted households in the age groups 55–64 years and 65–74 years using the 2016 Survey of Financial Security.