



Higher interest rates and household debt: Cause for recession?

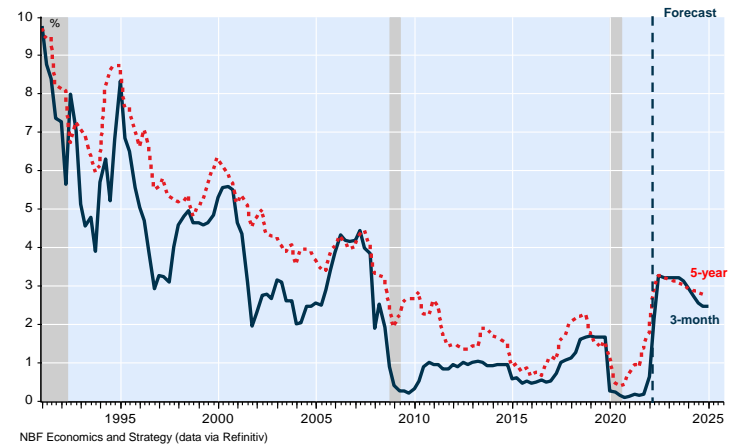
By Matthieu Arseneau and Daren King

- There is a great deal of concern regarding the vulnerability of Canadian households not only to inflation shock but also to sharp interest rate hikes.
- For heavily indebted households, the bill could prove hefty. Those that contracted mortgages 4.5x their gross income could see their monthly payments increase by \$187 to \$281 from 2022 to 2024 and absorb as much as 2.6% to 4.0% of their net income.
- At the macroeconomic level, however, the story is far different given the high proportion of properties without mortgages. By our calculations, the payment shock related to servicing the accumulated debt will represent 0.65% of disposable income over the next three years. The amount is significant but manageable in that it alone will not suffice to pull the economy into a recession.

Inflation surged in the past year to heights unseen in four decades both in the United States and in Canada. In this context, the central banks are showing tremendous resolve to rein it in by raising interest rates at a frenetic pace. Over at the Federal Reserve, the median forecast for the federal funds rate at the end of 2022 represents an increase of 325 basis points in only nine months. Over at the Bank of Canada, Governor Tiff Macklem stated that the policy rate could have to go to 3% or more in order to bring inflation under control. As for us, we expect the policy rate to stand at 3.25% at the end of the year and the 5-year government bond yield to be 3.20%, which would mean that interest rates would be at their highest level since 2007.

Sharp increase in interest rates over short span

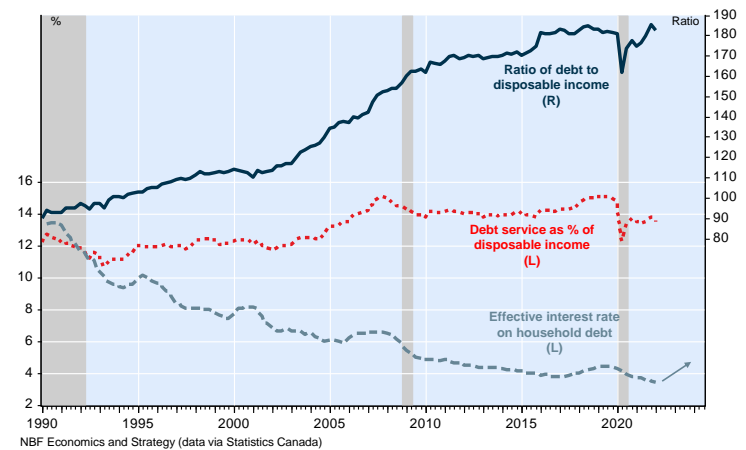
5-year government bond yield and 3-month Treasury bills (NBF forecast from 2022Q3 to 2024Q4)



Over one year, it would represent the sharpest increase in interest rates since 1995. Back then, however, household debt represented 105% of disposable income; today it stands at 182%, that is, essentially the same level it was at before the pandemic¹.

Historical perspective on household debt

Ratio of debt to disposable income, cost of debt service, and effective debt rate (1990–2022)

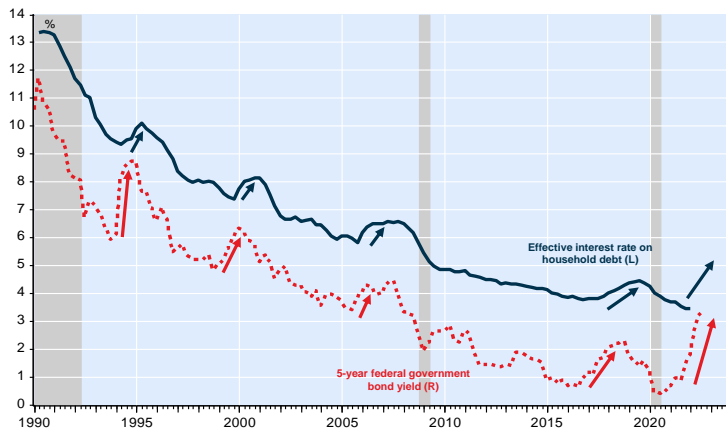


The effective interest rate, which kept declining in the first quarter of 2022, is expected to rise over the coming quarters. At a time when consumers are already subject to a purchasing power shock via inflation, they will also face a heavier debt burden. How much will this payment shock slow down consumption in Canada? In this Special Report, we examine the Canadian economy's vulnerability to an increase in the borrowing cost of debt already accumulated.

¹Household debt in Canada includes non-incorporates businesses

Effective interest rate for Canadian households expected to rise

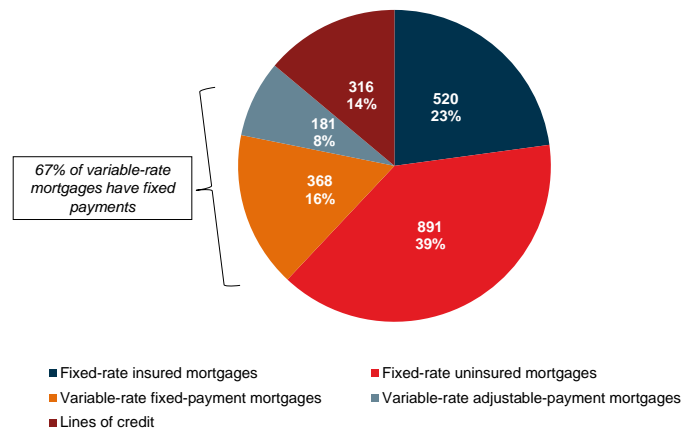
Effective interest rate on household debt and 5-year federal government bond yield



NBF Economics and Strategy (Statistics Canada and Refinitiv data)

Household debt subject to interest payment shock

Household debt at 2021Q4, in billions of dollars



NBF Economics and Strategy (Statistics Canada)

Structure of household debt

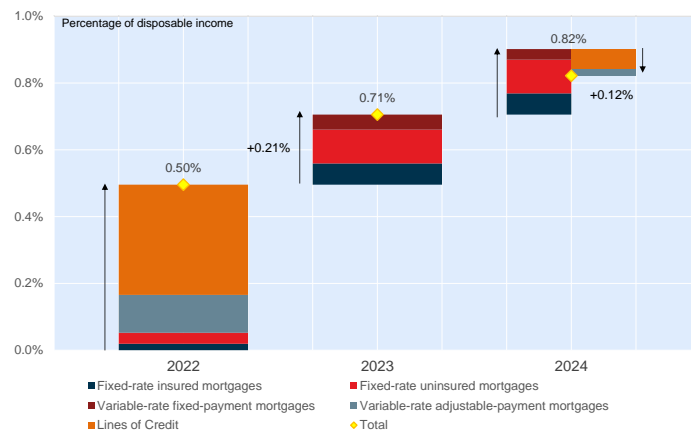
In the fourth quarter of 2021, the accumulated debt of Canadians totaled \$2657 billion. However, not all of this debt is affected by higher interest rates. The vast majority of installment loans are fully amortized at the contract rate, which means that interest burden does not increase when rates rise. The same holds true for credit cards, which seldom see their interest rates change. By our estimates, the debt that could be affected by interest rate hikes remains considerable at \$2276 billion, that is, 87% of the total debt. The interest payments on lines of credit (\$316 billion) are directly affected by policy rate fluctuations. As for fixed-rate mortgages, both insured (\$520 billion) and uninsured (\$891 billion), the impact of rate hikes will be felt gradually, given that it depends on the amount to be renewed and the mortgage rates in effect when the loans were last renewed or first signed. Where variable-rate mortgages (\$549 billion) are concerned, while the interest portion of the payment varies as a function of the policy rate, the total payment is not always affected. We estimated that for 67% of variable-rate mortgages the payment is fixed (\$368 billion), which means that the impact of interest rate hikes on this portion of the debt will be felt at renewal as well. For the remaining 33% of variable-rate mortgages (\$181 billion), payments are immediately adjusted when a policy rate change occurs.

What can we expect?

By our estimates², the additional amount that Canadian households will have to pay from 2022 to 2024 on account of higher interest rates is \$30.4 billion, that is, \$7.4 billion in 2022, \$10.6 billion in 2023, and \$12.4 billion in 2024. In terms of disposable income, 0.50% of household income in 2022 will serve to cover this increase in payment, an extra 0.21% in 2023 for a total of 0.71%, and another 0.12% in 2024 for a total of 0.82%.

Outlook on debt service

Increase in debt service as a percentage of disposable income



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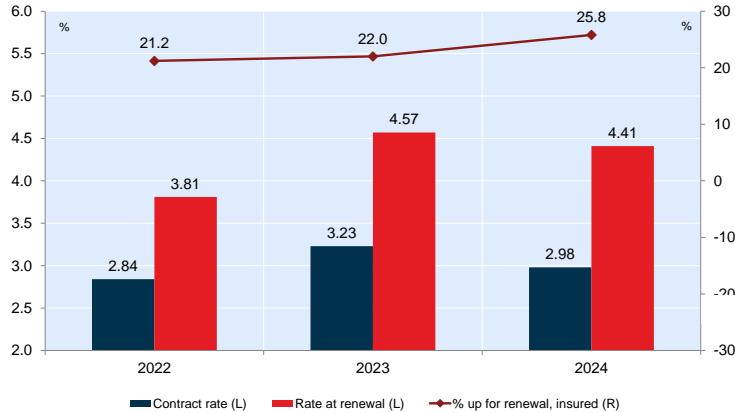
In 2022, most of the increase in payments will be driven by the rapid and significant rise of the policy rate. Rate hikes will have an immediate impact on variable-rate variable-payment mortgages and lines of credits, which we estimated at \$6.7 billion. As for fixed-rate insured and uninsured mortgages, the interest rates in effect at renewal will be higher than before, but the impact will be less considerable than on variable-rate products, the increase in payments amounting to only \$778 million. It turns out that for this type of debt, the impact is much more gradual on the economy, given that only a portion of these loans need to

² See appendix for methodology and hypotheses.

be renewed each year (between 21% to 26% for insured mortgages). The fact remains, however, that for borrowers with insured mortgages up for renewal in 2022, the bill will be hefty, as the rate will be 97 basis points higher on average than before.

Payment shock for insured mortgages

Contract mortgage rates by renewal year, expected rate at renewal, and proportion up for renewal



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For variable-rate fixed-payment mortgages up for renewal, the payment shock will be minimal in 2022, the increase amounting to a mere \$13 million.

In 2023, we expect fixed mortgage rates to peak in the first quarter and to remain significantly above the current rate of mortgages that will be up for renewal. The increase in payments for these two fixed-rate products will amount to \$2.5 billion in 2023. For variable-rate products, the Bank of Canada policy rate should peak at 3.25% at the end of 2022 and remain stable throughout 2023. As a result, we expect no additional burden from variable-rate variable-payment mortgages and lines of credit. However, variable-rate fixed-payment mortgages will face an increase in payment shock of \$674 million at renewal.

In 2024, there will still be a difference between the interest rate at renewal and the previous rate for fixed-rate insured and uninsured mortgages. This will translate into \$2.5 billion more in payments. For the three years of our scenario, households will have to disburse a total of \$9.8 billion more for these two products. For variable-rate products, we expect the Bank of Canada policy rate to decline to 2.50% by the end of 2024. As a result, payments on variable-rate variable-payment mortgages and lines of credit will decrease \$1.2 billion from the amount paid the year before. However, this rate will still be higher than the rate in effect early in 2022. From 2022 to 2024, Canadian households will pay an additional cumulative amount totaling \$18.8 billion for these two products. Finally, for variable-rate fixed-payment mortgages, the interest rate at renewal will always be higher than the rate currently in effect. This means payments will increase by \$475 million. The cumulative increase for this product from 2022 to 2024 will be \$1.9 billion.

Contribution of different products to payment shock

Impact on debt payment of higher interest rates, in dollar amount and as proportion of disposable income

	2022	2023		2024		Cumul. (M\$)
	Impact (M\$)	Marginal impact (M\$)	Impact (M\$)	Marginal impact (M\$)	Impact (M\$)	
Fixed-rate mortgages insured	292	959	1,251	955	2,207	3,750
Fixed-rate mortgages uninsured	486	1,522	2,007	1,517	3,525	6,018
Variable rate mortgage (fixed payment)	13	674	687	475	1,162	1,862
Variable rate mortgage (adjustable payment)	1,702	-	1,702	(306)	1,396	4,801
Line of credit	4,956	-	4,956	(890)	4,066	13,977
Total	7,449	3,155	10,604	1,752	12,356	30,408
Total % of disposable income	0.50%	0.21%	0.71%	0.12%	0.82%	0.65%

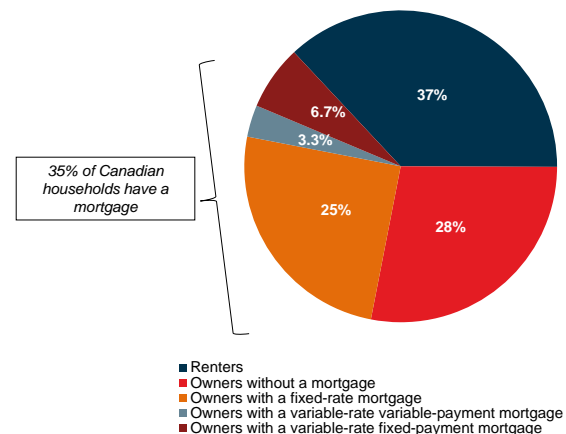
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Uneven distribution of increase in debt burden

As mentioned above, the increase in debt payments on account of higher interest rates will represent 0.50% of disposable income in 2022, 0.71% in 2023, and 0.82% in 2024. For the three years cumulatively, this amounts to 0.65% of personal disposable income. While this is significant and expected to moderate consumption, in our opinion this shock alone is not enough to pull the economy into a recession. Some people might be surprised by the results of our calculations, as the amounts may appear relatively small in the aggregate. However, it is important to bear in mind that the burden of higher interest rates will not be borne evenly by all households. If we consider mortgage debt, it is important to remember that, in Canada, although 63% of households are homeowners according to the latest Survey of Financial Security (2019), 44% of them do not have a mortgage. This means that only 35% of households will have to deal with higher payments on mortgage loans and home-equity lines of credit.

Majority of Canadian households have no mortgage

Breakdown of Canadian households



NBF Economics and Strategy (Bank of Canada and NBF estimate)

There are also deep differences among borrowers. The last few years were marked by a strong increase in home prices. This pushed many buyers to borrow large amounts relative to their income to be able become property owners. A non-negligible proportion of borrowers contracted loans that exceeded 4.5 times their gross income, a limit considered risky, notably, by the Office of the Superintendent of Financial Institutions.

Let us take the example of a couple without children, living in Ontario, and earning \$50,000 in gross income each for a total gross family income of \$100,000 (net income ≈\$85,000). Their 5-year fixed-rate insured mortgage amortized over 25 years will be up for renewal from 2022 to 2024. If the loan was for an amount 2.5x their gross income, higher interest rates will increase their monthly payment by \$104 to \$156, that is, 1.5% to 2.2% of their disposable income. If the loan was for an amount 4.5x their gross income, they will see their monthly payment increase by \$187 to \$281, that is, 2.6% to 4.0% of their net income, which is much higher than the figures we previously reported for Canadian households as a whole.

Deep impact at renewal for heavily indebted households

Expected increase in monthly payment at renewal for 5-year insured mortgage amortized over 25 years for loan 2.5X, 3.5X and 4.5X gross income of childless couple of \$100K (Net ≈\$85K)

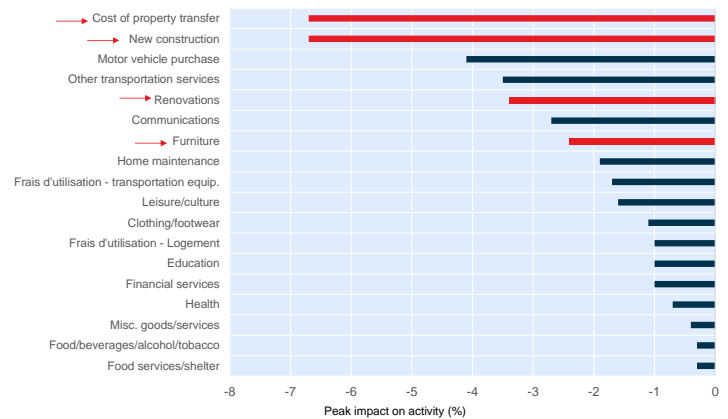
		2022	2023	2024
Actual rate		2.8%	3.2%	3.0%
Forecasted rate at renewal		3.8%	4.6%	4.4%
\$250,000	Difference	\$104	\$148	\$156
	Difference / Net revenue	1.5%	2.1%	2.2%
\$350,000	Difference	\$145	\$207	\$218
	Difference / Net revenue	2.0%	2.9%	3.1%
\$450,000	Difference	\$187	\$267	\$281
	Difference / Net revenue	2.6%	3.8%	4.0%

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also facing a negative wealth effect from the losses they are registering nowadays in both their stock portfolios and their bond portfolios. Home prices could pull back as well in the coming months to sap consumer confidence even further. Moreover, higher interest rates mean that individuals will be more reluctant to purchase properties, renovate and spend, as the housing-related components of GDP are the most vulnerable in the current environment. Finally, the substantial increase in the cost of capital should dampen the investment intentions of businesses, all the more so that growing fears of an imminent recession could prompt company managers to proceed with caution.

Canada: Housing activity very sensitive to interest rates

Sensitivity to 100-basis-point policy rate shock



NBF Economy and Strategy (Bank of Canada data)

Conclusion

There is a great deal of concern regarding the vulnerability of Canadian households not only to inflation shock but also to sharp interest rate hikes. Whereas some borrowers will certainly be more sensitive to hikes, the current structure of household debt suggests that the payment shock will be significant but manageable in that it will not be enough in and of itself to pull the economy into a recession. If we consider that real disposable income grew on average 2.2% per year over the past ten years, a payment shock equivalent to 0.65% of disposable income over three years should slow consumption down just a tad, nothing more. This stands in stark contrast with the alarmist tone of mainstream voices that expect consumption to tumble for this reason.

However, observers are right to worry about the risk for recession as it is hard to say which straw will be the one to break the camel's back. As it happens, a payment shock is but one of the multiple mechanisms by which monetary policy is transmitted to the economy. Because of the surge in interest rates, households are

Methodology and hypotheses

For this report, we developed a methodology that led us to make a certain number of assumptions to evaluate the impact of rising interest rates on household debt already accumulated. We make no projections regarding new debt.

Methodology

1. We determined the volume of the different products that will be impacted by a change in interest rates: fixed-rate mortgages up for renewal, variable-rate mortgages during term and at renewal, and lines of credit.
2. For mortgages subject to a payment shock at renewal (fixed-rate mortgages and variable-rate fixed-payment mortgages), we determined the existing interest rate and forecast the rate at renewal.
3. Using the volume and the difference between old and new interest rates, we calculated the change in interest payment at renewal for fixed-rate mortgages and for variable-rate fixed-payment mortgages. However, this increase in interest payment is not fully felt by households at renewal, as it is offset by a decrease in the amount of principal repaid. According to our simulations, only 60% of the increase in interest is reflected in the final payment shock thanks to the decrease in the principal portion of the payment.
4. For variable-rate variable-payment mortgages and lines of credit, we applied the change in interest rate to the entire portfolio.
5. We expressed the increase in the interest payment as a percentage of disposable income to determine the additional burden to be borne by households.

Hypotheses

Determining volumes

- According to [Statistics Canada data](#) at the end of the fourth quarter of 2021, total Canadian household credit was \$2657 billion, of which \$1954 billion was mortgage credit and \$703 billion was non-mortgage credit.
- Using [Bank of Canada data](#) on household credit provided by chartered banks, we separated mortgage credit from banks into insured (30%) and uninsured (70%) loans. With this data, we were able, also, to break down the fixed-rate and variable-rate loan portfolios of banks (83% fixed-rate insured loans, 67% uninsured loans).
- For non-bank lenders, we used [CMHC data](#) to obtain the distribution of insured (39%) and uninsured (61%) mortgages, but we were unable to determine the distribution between fixed-rate and variable-rate loans. We therefore assumed the same split as for bank lenders.
- For non-mortgage loans, we assumed that all personal loans and credit card volumes were fixed rate and would be fully repaid at the end of their amortization. We are aware that

some personal loans may have a variable rate and that the rate on credit card cash advances fluctuates with the Bank of Canada policy rate, but this represents only a small proportion of loans.

- The volume of bank lines of credit (personal and home equity) was determined from [Statistics Canada data](#). For non-bank lenders, where this information was not available, we used the same ratio of lines of credit to total non-mortgage credit as observed for banks.
- For the purpose of this report, we assumed that the size and breakdown of the household credit portfolio was fixed over time.

Variable-rate mortgages

- We distinguished between variable-rate variable-payment mortgages and variable-rate fixed-payment mortgages.
- For variable-rate variable-payment mortgages, payment fluctuates as soon as the prime rate changes.
- For variable-rate fixed-payment mortgages, we assumed that renewal occurred after 5 years (only a very small proportion of loans do not have this term). It is true that if the prime rate increases too much, borrowers could find themselves in a situation where they pay almost no principal on their loan. In such a scenario, the amount of the payment might change if a threshold specified in the mortgage contract is reached. **However, this threshold should not be reached according to our interest rates scenario.** We therefore assumed that payment for this type of mortgage did not change during the term.
- After determining the size of the variable-rate mortgage portfolio, we estimated the split between fixed- and variable-payment mortgages. To this end, we used [Bank of Canada data \(graph 1-B\)](#), which indicate that all bank lenders offer variable-rate fixed-payment mortgages, with the exception of National Bank and Scotia. Other than Desjardins, the vast majority of non-bank lenders offer variable-payment products. Using [CMHC data](#) to estimate the market share of non-bank lenders, we determined that approximately 67% of all variable-rate mortgages come with a fixed payment.

Mortgage renewal volume

- To calculate the impact of the interest rate shock on mortgage renewals, we used [Bank of Canada data](#) on new mortgage originations by term and weight in the overall portfolio. This was done separately for fixed-rate insured mortgages, fixed-rate uninsured mortgages, and variable-rate mortgages. This allowed us to estimate the volume of mortgages up for renewal on a quarterly basis.



Historical interest rate and interest rate scenario

- For the interest rate scenario, we forecast mortgage interest rates for a 5-year term and assumed that all fixed-rate insured and uninsured mortgages would renew at that rate.
- The historical rate for fixed-rate mortgages up for renewal was estimated from data collected from the mortgage-backed securities market.
- For the rate scenario for variable-rate mortgages and lines of credit, we used our forecast for the Bank of Canada policy rate.
- The historical rate for variable-rate fixed-payment mortgages up for renewal was estimated from [Bank of Canada data](#). We used the rate for new loans granted 5 years ago as the renewal rate. We estimated the new variable-rate level at renewal based on our forecast for the policy rate.
- For variable-rate variable-payment mortgages and lines of credit, we applied the change in the policy rate as the interest rate shock. The prime rate used by banks generally moves in lockstep with the policy rate.

Disposable income

- We used [Statistics Canada data](#) on household disposable income from the first quarter of 2022 and applied a 1% increase per quarter over the entire projection period.

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