

## ***Submission to the Office of the Superintendent of Financial Institutions***

### ***Public Consultation on Guideline B-20: Residential Mortgage Underwriting***

In this submission, I comment on two of the question sets.

- In section 1 of the consultation paper, OSFI proposes limits on loan-to-income and total-debt-to-income ratios. Before implementation, OSFI should publish quantitative risk analysis that explicitly justifies the thresholds selected. If policy changes that will impede housing transactions are not justifiable, they will unnecessarily impose damage on consumers, and they will further constrain new supplies of housing, which will in the long-term worsen pressures within the Canadian housing system.
- Much of the discussion in this submission is related to section 3 (concerning Minimum Qualifying Rates). In a nutshell:
  - MQRs should differ for variable rate and fixed rate lending.
  - It is arguable and demonstrable that the MQR has been (and remains) too high for fixed rate mortgages, due to the failure to consider the income growth that will happen by the time of mortgage renewal.
  - MQRs should be sensitive to economic context. In the current environment, there is no case for continued use of a 2-point increment above contracted rates.
  - Starting at the bottom of page 20, this document makes a proposal for a sliding scale of MQR increments, and argues for a 0.5-point increment in the current context.
  - I am aware that some industry associations have previously made similar arguments and proposals for a sliding scale. I am not aware that OSFI has ever responded to those proposals, and in particular it has not justified its failure to make reasonable provision to include income growth in the stress test.
  - OSFI knows that growth of income is a substantial factor in outcomes for mortgage lending: in the MQR statement from December 2022, the first risk mentioned is “a reduction in income”. Growth in incomes is also a risk factor, albeit a positive risk.

This submission is largely focused on pre-existing concerns about Guideline B-20. The concerns are discussed in detail in Appendices. I introduce those discussions as follows:

- Research shows that mortgage defaults are mainly related to job loss and reductions in income, rather than to changes in interest rates and levels of payments. Therefore, the emphasis in Guideline B-20 should be on prospects for incomes, rather than on scenarios for future interest rates. The research is discussed in Appendix 1.
  - OSFI is aware that loss of income is a major risk factor, and has sometimes defended the current design of its stress test (especially the 2-point increment for interest rates) with an argument that it reduces the risk associated with job loss. To the contrary, it takes very little thought to conclude that calculating the impact of higher interest rates tells us nothing about the consequences of a severe loss of income.
  - It would be appropriate for Guideline B-20 to be more concerned with the predominant risk in mortgage lending, which is reduction of ability-to-pay. The primary objective

should be to ensure that lenders have policies and procedures that adequately assess borrowers' situations and prospects with respect to employment and incomes. When income-related risks are managed, there should be much less concern about scenarios for interest rates.

- The inappropriate policy focus has imposed high costs on Canadians, unreasonably impairing their abilities to make housing choices that they believe would be in their best interests. In consequence, the long-term performance of the Canadian economy will be impaired.
- Stress testing for transferred mortgages does not reduce the overall level of risk in the financial system. Mortgage transfers just change the location of risks.
  - By potentially causing borrowers to be trapped at their current lenders, and potentially at interest rates higher than they could obtain in the marketplace, this policy adds to financial pressures, which raises risks within the economy and therefore within the financial system. This concern is briefly discussed in Appendix 2.
  - The risk that borrowers could be trapped was negligible until recently, but has become elevated during this period of high interest rates.
  - This policy is contrary to the mandate of OSFI.
- The mortgage stress tests make calculations in the present for an event that will occur in the future, but the calculations consider only one factor that will affect future outcomes – possible changes in interest rates. As is shown in Appendix 1, changes in incomes will be critical in determining future outcomes.
  - The policies err by not considering income growth.
  - This is developed further in Appendix 3, where it is concluded that the current design over-estimates future debt service ratios: these will be determined by the combined effects of higher interest rates, higher incomes, and repayment of principal.
  - In consequence, the current design of the stress tests unduly constrains consumers' choices.
  - A table at the end of Appendix 3 (page 20) proposes a schedule of increments that could be used to simplify the calculations, to simulate the combined effects of a 2-point rise in interest rates, as well as income growth and principal repayment.
- Some of the research discussed in Appendix 1 has concluded that risk of default is related to equity ratios. The qualifying rate increments should be sensitive to this. At some point, there is enough equity that testing can safely be done at the actual contract rate. There should be a sliding scale of interest rate increments that are related to equity ratios.
- The determination of the minimum qualifying rate does not give sufficient attention to context.
  - The key assumption used in the stress tests, that future interest rates might be 2 points higher, has not been adequately justified. In the not-too-distant past, when interest rates were at historic lows, that assumption was reasonable for the purpose of risk analysis. But now, when rates are at the highest level in over a decade, and concerns are growing about economic impacts that may develop during the coming two years, it is arguable that a further 2-point increment should not be used - unless there is an explicit analysis that concludes such a rise has a non-trivial probability of actually occurring.
  - The last paragraph of Appendix 3 (on page 21) argues that, at present, a smaller rate increment is appropriate (perhaps a half-point).

- Adding this concern to the prior discussion about the effects of income growth, at this time, for borrowers with fixed rates, it would be reasonable to test at the actual contracted rates.
- That would provide incentive for new mortgages to have fixed rates rather than variable, which in itself would reduce risk.
- In several ways, a decade of escalation of federal mortgage regulations has added to risks in the economy and the financial system. The evolving Guideline B-20 is part of that increasingly counter-productive set of policies. This is discussed in Appendix 4. To summarize that discussion:
  - During the past decade, the escalating regulations have suppressed sales transactions in the housing market, but they have not altered the demand for housing (the requirements that result from our growing population). The suppression of transactions has reduced sales of new homes, which has impaired new housing construction. Thereby, the regulations have contributed to the housing shortages that exist in Canada.
  - The analysis in Appendix 4 compares resale market data for the US and Canada, and concludes that as the result of the escalating federal regulations, housing sales in Canada have been about 10% lower than they would otherwise have been. On that basis, it is likely that new housing construction has also been impaired by about 10%, accounting for about 200,000 dwelling units of the current housing shortage in Canada.
  - Further, the analysis shows that (since the beginning of 2018) the OSFI stress test has had a substantial negative impact on housing sales. Therefore, Guideline B-20 is increasingly contributing to the existing housing shortages.
  - In Appendix 4, I refer to the policy escalation as a game of whack-a-mole: it doesn't reduce pressures within the housing (and finance) system, it just changes the locations and characteristics of the pressures. Furthermore, since the demand for housing (the requirements that result from our growing population) is not affected, but the supply is impaired, the policies have actually raised pressures within the housing system.
  - Thus, the escalating regulations have become increasingly harmful to Canadians. During 2021 until early last year, the pressures were mainly manifested in extremely rapid price growth for housing. In the present, with home buying sharply suppressed by high interest rates, the pressures are being manifested chiefly in the rental sector. Just like the arcade game, the escalating regulations have been futile and wasteful.

### ***An Overall Comment***

Some observers have commented that the continued exceptionally low rate of mortgage arrears in Canada, in the face of sharply higher interest rates, indicates that the mortgage stress tests have reduced financial risks in Canada. I disagree, as the research suggests a more nuanced interpretation.

Appendix 1 reviews research from the International Monetary Fund, the Federal Reserve Bank of Philadelphia, and the Bank of Canada, plus my research on the Canadian situation. The primary conclusion is that risks related to loss of income are much greater than risks related to interest rates.

Based on the available research, it should be concluded that the rate of mortgage arrears in Canada remains very low because the employment situation remains very strong: while higher interest rates are creating challenges for borrowers, current stability of incomes (on top of prior growth) gives lenders and borrowers a lot of latitude to solve problems and avoid mortgage default (and more importantly, to avoid mortgage foreclosure and power of sale).

During the past year, senior officials at the Bank of Canada have made it clear that they consider the Canadian economy overheated (especially including the employment situation). The current high interest rates are intended to weaken the economy (and comments from senior BoC officials make it clear that this includes an objective of weakening the employment situation). To the extent that the Bank's interest rate policies succeed, job losses and reduced income can be expected, which will raise the incidence of mortgage arrears (and potentially causing more mortgage foreclosure and power of sale).

**At this time, the greatest risk factor for the Canadian financial system is the interest rate policies of the Bank of Canada, because of the damage that might be done to employment and incomes.**

I am hopeful that quantitative research on risk factors will substantively assist OSFI (and the Department of Finance) in its deliberations.

#### ***About this Writer***

I have been analyzing Canadian housing markets since 1982. Until 1997, I was employed at Canada Mortgage and Housing Corporation, in various positions in economic and housing market analysis. For three years, I was second-in-command of a boutique consultancy. Since 2000, I have operated as a one-person consulting company. My clients have included a wide range of interests, including all levels of government within Canada, agencies, non-profit organizations, industry associations, financial institutions, home builders, investors, and asset managers. My research has been cited in the news media and in economic research, including some Bank of Canada studies.

For several years (from 2005 until the spring of 2021), I was identified as Chief Economist of Mortgage Professionals Canada<sup>1</sup>. That work occurred under a consulting contract, and was only a part (about one-quarter) of my professional activity. I remained independent.

No one paid me to prepare this submission.

Submitted by: Will Dunning

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<sup>1</sup> And its predecessors, the Canadian Institute of Mortgage Brokers and Lenders, and the Canadian Association of Accredited Mortgage Professionals.

## **Appendix 1**

### **Drivers of Mortgage Default**

In this Appendix, it is concluded that changes in employment situations are much more important than changes in interest rates in driving mortgage arrears. This conclusion is based on three research reports (from the Federal Reserve Bank of Philadelphia, the International Monetary Fund, and the Bank of Canada) plus this writer's own research (which has similar findings)

#### **Federal Reserve Bank of Philadelphia**

The report "Individual and Local Effects of Unemployment on Mortgage Defaults" is dated November 2021:

<https://www.philadelphiafed.org/consumer-finance/mortgage-markets/individual-and-local-effects-of-unemployment-on-mortgage-defaults>

This study used "panel data" (data on individuals), at two-year intervals during 2009 to 2017. The initial (simple) analysis of the data on individuals found that "The default rate for the whole sample is 2.66%, while the default rate for the employed is 2.35% and for the unemployed, 8.54%... This is a difference of default rates of 6.2 percentage points, or 360%, between the unemployed and the employed."

Then, detailed analysis included other "sociodemographic and financial attributes". It found that the effect of unemployment on default is greatest for borrowers with current loan to value ratios exceeding 100%, less liquidity (having less than \$1,000 in available funds), and variable rate mortgages. The study concluded that "The unemployment of an individual has a large effect on their mortgage default rates, between 2 and 3 percentage points from an average default rate of 2.7% (that would be an increase of between 74% and 111%)."

This research did not report on the effects of interest rates on defaults (either the level of rates or changes in rates).

#### **International Monetary Fund**

The report "What Drives Mortgage Default Risk in Europe and the U.S.?" is dated April 2022:

<https://www.imf.org/en/Publications/WP/Issues/2022/04/01/What-Drives-Mortgage-Default-Risk-in-Europe-and-the-U-S-515963>

This research report concluded that unemployment and interest rates affect the probability of mortgage default, but did not provide numeric estimates of the impacts and therefore it does not shed light on the relative effects of the drivers of default. The report does provide some other useful observations, including that the probability of default is affected by factors like:

- Unemployment benefits (income replacement rates and duration of benefits).

- In countries that have high shares of variable rate versus fixed rate mortgages, there is greater sensitivity to changes in interest rates.<sup>2</sup>
- House price growth reduces the probability of default.
- The extent to which mortgages are limited recourse raises risk (especially in the US).

### **Bank of Canada**

This older research report (“Household Risk Assessment Model”) is dated September 2016:

<https://www.bankofcanada.ca/2016/09/technical-report-106/>

This analysis (like the two studies discussed above) used “micro-data” (data on individual households.) It created very complex simulations of how finances would be affected by various shocks.

An intriguing table (Table 6, on page 52) shows the estimated impacts on arrears resulting from various increases in the unemployment rate and interest rates. Table 1 (on the next page) is divided into three blocks. The original estimates are shown in the first block. The second block applies those changes to the starting arrears rate of 0.47%<sup>3</sup>, to calculate what the arrears rates might be during the third year, in the various scenarios. The third block shows how much increase is expected in each scenario (in percentage points) compared to the starting point. These calculations indicate that changes in the unemployment rate have considerably larger impacts than changes in interest rates. For example, a 2-point increase in the unemployment rate would cause the arrears rate to rise to 0.86% (shown in the second block), which would be an increase of 0.39 points (in the third block). Alternatively, a 2-point rise in the interest rate (without any change in the unemployment rate) would result in an arrears rate of 0.58%, a rise of 0.11 points from the initial rate. It can also be seen in the third block that a 4-point rise in the interest rate has a smaller impact (0.26 point) than a 2-point rise in the unemployment rate (0.39 point).

The analysis looks at the impacts of other factors, but little information is provided on estimated effects.

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<sup>2</sup> In Canada, the variable share increased sharply during 2022, to a peak of 35.7% as of September, versus an average of 23.6% in the available data. The variable rate share has begun to retreat (to 33.5% as of this January). In the analysis of Canadian data that is discussed below, the variable rate share was considered as a factor. But, it does not show the effect found in the IMF study. In fact, the impact has the “wrong sign” – an increase in the variable share is estimated to reduce arrears by a very small amount. This likely occurs because an increase in the variable share tends to reduce the average interest rate for outstanding mortgages: the reduction in the average interest rate appears to be offsetting the vulnerability that results from increased reliance on variable rates. Moreover, the estimated effect is not statistically significant, as the t-Statistic is -1.33.

<sup>3</sup> This is the arrears rate in the dataset that was used by the Bank of Canada, as of the first quarter of 2012. This figure differs from what was shown in the data on mortgage arrears from the Canadian Bankers Association, which was 0.37% at the same date (since the BoC analysis looks at total indebtedness).

<b>Table 1</b>			
<b>Estimated Impacts Shown in Bank of Canada 2016 Study</b>			
<i>Showing Estimated Changes in Arrears Rates</i>			
Change in Unemployment Rate	Change in Interest Rate (percentage points)		
Percentage points	0	2	4
0	0%	24%	55%
2	84%	120%	173%
4	118%	161%	221%
6	153%	202%	272%
<i>Simulated Arrears Rate (versus Initial Rate of 0.47%)</i>			
Change in Unemployment Rate	Change in Interest Rate		
Percentage points	0	2	4
0	Initial 0.47%	0.58%	0.73%
2	0.86%	1.03%	1.28%
4	1.02%	1.23%	1.51%
6	1.19%	1.42%	1.75%
<i>Increment versus Initial Arrears Rate (in percentage points)</i>			
Change in Unemployment Rate	Change in Interest Rate		
Percentage points	0	2	4
0	Initial	0.11	0.26
2	0.39	0.56	0.81
4	0.55	0.76	1.04
6	0.72	0.95	1.28
Source: Table 6 of BoC report, compiled by Will Dunning			

### ***This Writer's Research***

In the three reports discussed above, “default” means that the borrower has missed a payment. The situation is labelled an arrear when the borrower is three months behind.

A more serious outcome is when the lender takes action against the property - forcing a sale (“power of sale”) or taking possession (“foreclosure”). I refer to these actions as “claims”. Obviously, a claim is much more serious for both sides than arrears. Lenders are often unable to fully recover what they are owed, and costs of the process add to their losses (and there is a less tangible loss of goodwill). The primary risk to lenders in mortgage lending is that they will have to take claims.

During my time at Canada Mortgage and Housing Corporation, I heard a discussion about the actuarial review of the Mortgage Insurance Fund, which concluded that the primary driver of mortgage claims is loss of ability to pay (chiefly, job loss, but also including family breakdown), and that changes in mortgage payments were much less of a factor. That conversation occurred more than 25 years ago. It appears that CMHC has not published this research, let alone any updates. But, I am confident that similar findings would occur today (and this is supported by the research discussed above, and below).

That said, I don't have access to data on claims and therefore I have focused on data on mortgage arrears (and the same appears to apply to the three studies discussed above)

In my research, I have repeatedly found that the rate of mortgage arrears in Canada is affected much more by changes in the employment situation than by changes in mortgage interest rates. The remaining discussion in this Appendix updates my research.

For more than a decade, I have been using variations of the chart to the right, which contrasts the rate of mortgage arrears in Canada (as reported by the Canadian Bankers Association<sup>4</sup>) with mortgage interest rates (in these charts, I have employed my opinion-estimates of "special offer" rates for 5-year fixed rate mortgages, offered by major lenders). This chart shows that there seems to be a relationship, as both the arrears rate and the interest rate have trended downwards.

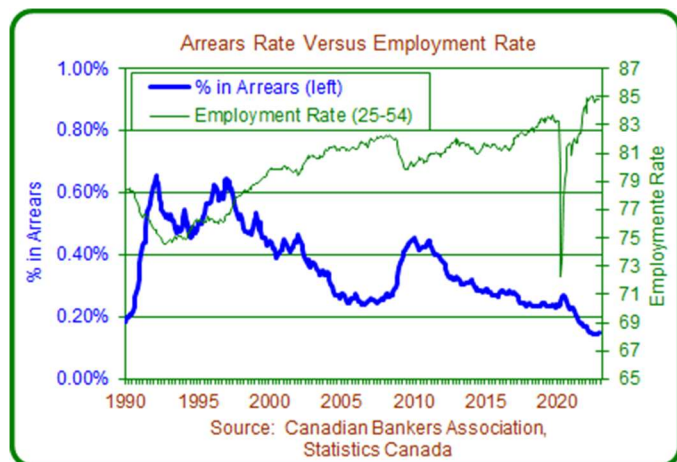


But, while there seems to be a relationship in general, there is a lot of inconsistency in the details, as there are several periods during which the two datasets moved in different directions, such as the second half of the 1990, the period that started late in the 2000s, and in the very recent data.

This data does not support a conclusion that changes in the arrears rate are caused by changes in interest rates. While interest rates might have some role, there must be other factors that are more powerful in driving changes in arrears.

This chart is hard to read (an easier version is on the next page). It shows a robust relationship, that changes in arrears are quite closely related to changes in the employment situation (there is a negative relationship, as the datasets move in opposite directions).

In this chart, I am portraying the employment situation using the employment-to-population ratio (the percentage of people who have jobs) for the 25-54 age group. This is sometimes referred to "prime age group" for employment. I also think of it as the prime age for home buying.



<sup>4</sup> The CBA data can be found here: <https://cba.ca/mortgages-in-arrears> and a table with historic data is available here: [https://cba.ca/Assets/CBA/Documents/Files/Article%20Category/Spreadsheets/stat\\_mortgage\\_oct2022\\_en.xls](https://cba.ca/Assets/CBA/Documents/Files/Article%20Category/Spreadsheets/stat_mortgage_oct2022_en.xls)



I'm also showing a variation of the chart that is easier to read: the order is reversed for the employment data. When viewed this way, there is a quite close relationship. There is still one period during which the arrears rate is obviously inconsistent with the employment data (the second half of the 2000s). As well, at the onset of Covid, the rise in the arrears rate is quite small relative to the change in the employment rate.



The interpretation of this data is that while a change in interest rates can result in large increases in monthly mortgage costs, people in stable employment situations can often make adjustments so that they can continue to meet their obligations. In this interpretation, it is loss of ability-to-pay that causes the greatest difficulties, not changes in required payments.

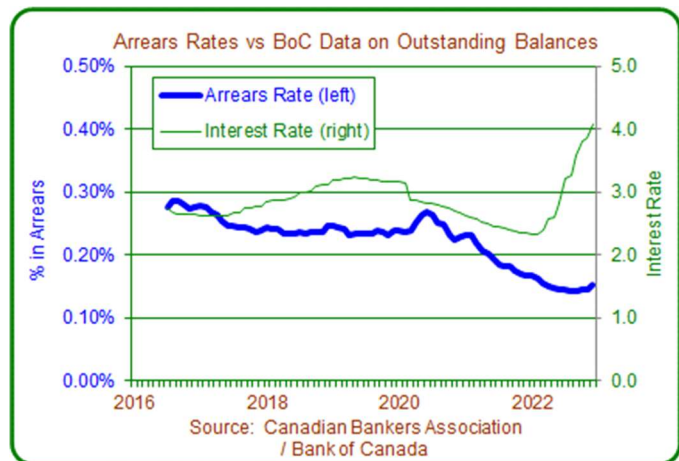
Recent events are consistent with this theory: the arrears rate has been at the lowest level ever seen, at the same time as the employment rate has been at the highest level ever seen. Meanwhile, until very recently, mortgage interest rates had been at the lowest levels ever. Interest rates have increased very sharply, from about 2% a year ago, to current rates in the area of 5%, but the arrears rate has not been materially affected.

This very recent data is thought provoking.

The first thought that arises is that perhaps rates that are currently being offered in the market are not the correct data to use: maybe what matters is the interest rates that are in effect for the entire portfolio of outstanding mortgages.

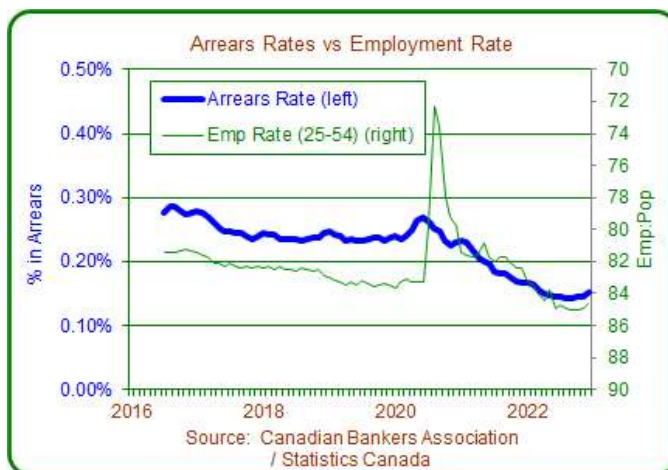
Unfortunately, we haven't had that data until recently. The Bank of Canada now publishes monthly data on average interest rates for "outstanding balances". The dataset commences in July 2016.

This chart uses that new data. It continues to show a very weak relationship: for example, during 2018 and 2019, the average interest rate<sup>5</sup> crept upwards, but the arrears rate was stable. During 2020 and 2021, there was consistency (there were reductions for interest rates and arrears). But, there is once again inconsistency during 2022. This data tells us that during this analysis period, a large rise in interest rates has had very little effect on mortgage arrears.

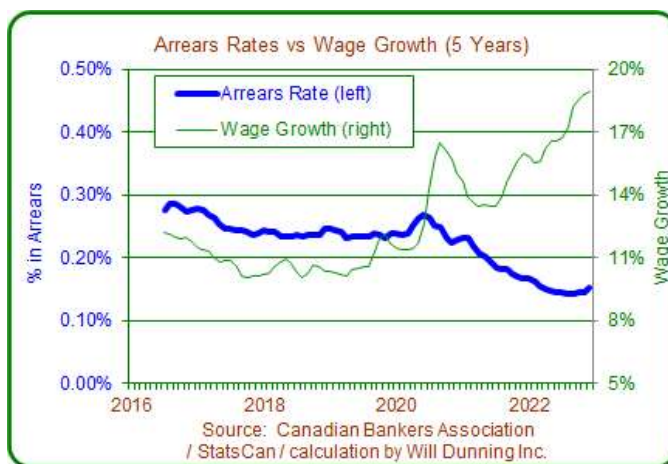


<sup>5</sup> The available data shows average rates for insured versus uninsured mortgages. In this chart, the uninsured rates are used, since they are the largest part of the mortgage balances.

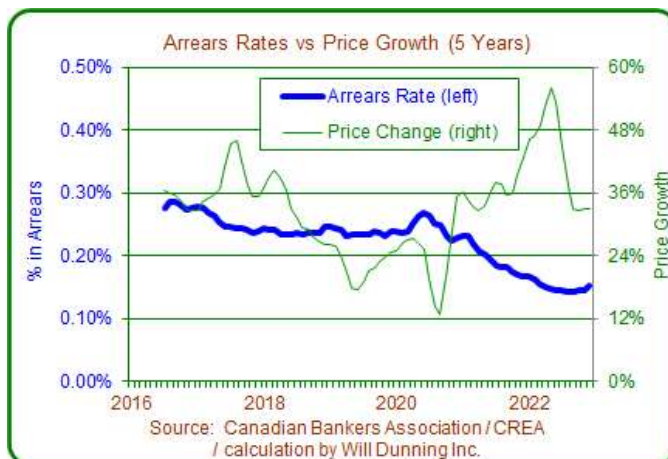
On the other hand, there appears to be a much stronger relationship between the employment situation and arrears. The arrears rate appears to be closely following the employment-to-population ratio. However, while the directions of the two datasets are consistent, the relationship is different mathematically, in the pre-Covid versus the Covid periods. This suggests that there are other important factors involved.



There is another aspect of the employment situation that seems to explain that mathematical shift in the relationship: wage growth (calculated per rolling 5-year periods) has been substantially more rapid during the Covid period. This has resulted in improvements in ability-to-pay, and this seems to have contributed to reduced mortgage arrears.



There is another difference during the Covid period that could potentially have affected arrears. In general, growth of housing values has been faster, and this might have affected arrears (for example, if a borrower gets into difficulty with payments, having a larger amount of equity creates options to solve the problem by re-financing or adjusting the payment, or in a worse situation, by selling the property). In this chart, it appears that there might be a relationship (that an increase in price growth reduces the arrears rate), but it requires a more rigorous testing.



These charts provide some hints that four factors influence the rate of mortgage arrears in Canada. Now, statistical analysis (regression analysis) is used to estimate the effects of each of the four factors.

The first step in the analysis looks at the factors one-at-a-time. The table below summarizes the results. In Table 2, the “Adjusted R-square” indicates how good the factor is at “explaining” variations in the arrears rate. A perfect “fit” would produce an adjusted R-square of 1.0. Another useful statistic is the “t-Statistic” – values above 2 (or below -2 when the factor has a negative effect) tell us that we should have confidence that the factor helps explain movements in the arrears rate.

In these estimates, each of the four factors has the expected direction of effect (higher interest rates tend to push the arrears rate up; for the other three factors, higher values push the arrears rate downwards). Each of the four factors passes the t-Statistic test, to varying degrees. Looking at the adjusted R-squares and t-Statistics, the interest rate is weakest at explaining the arrears rates, while wage growth is strongest.

<b>Table 2</b>			
<b>Summary Statistics from Univariate Analysis of Mortgage Arrears Rates</b>			
<i>Factor</i>	<i>Positive or Negative Effect?</i>	<i>Adjusted R-square</i>	<i>t-Statistic</i>
Mortgage Interest Rate for Outstanding Balances	Positive	0.078	2.70
Employment-to-Population Ratio for 25-54 Age Group	Negative	0.149	-3.73
Wage Growth During the Past 5 Years	Negative	0.583	-10.2
Growth in Average House Price During the Past 5 Years	Negative	0.239	-4.91
Source: calculations by Will Dunning			

The more interesting and useful analysis looks at the four factors simultaneously, in an attempt to separate the contributions of each of the factors.

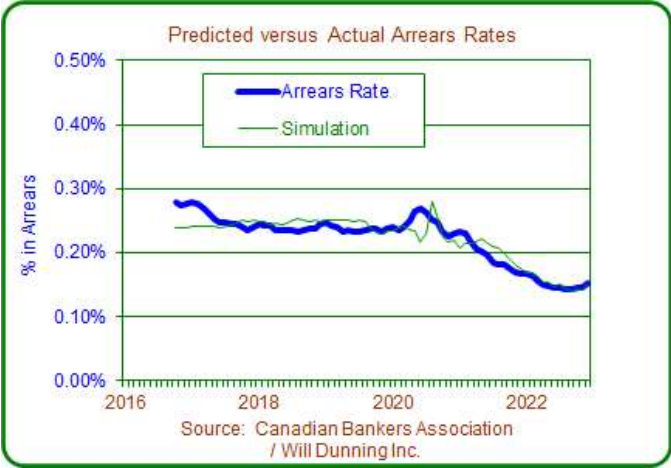
In combination, the four factors do a very good job in explaining changes in the arrears rate. The adjusted R-square is 0.798, which in my experience is a very good result for data of this sort. The results are summarized in Table 3.

As is shown by the “Coefficients”, all four factors have the expected positive or negative signs. But, the factors vary a great deal in their statistical reliability, as wage growth and the employment rate have strong t-Statistics, whereas interest rates and price growth are not statistically reliable. The small coefficient and lack of reliability for interest rates is consistent with my prior expectations, that so long as the borrower has a stable employment situation, solutions can usually be found for increased payments. The extremely low coefficient and reliability for house prices is surprising, but selling a house to solve a mortgage problem is a rare event (especially when employment is stable).

<b>Table 3</b>			
<b>Results of a 4-Variable Model for Mortgage Arrears Rates</b>			
<i>Factor</i>	<i>Positive or Negative Effect?</i>	<i>Coefficient</i>	<i>t-Statistic</i>
Mortgage Interest Rate for Outstanding Balances	Positive	0.000242	1.63
Employment-to-Population Ratio for 25-54 Age Group	Negative	-0.000089	-6.02
Wage Growth During the Past 5 Years	Negative	-0.011208	-13.5
Growth in Average House Price During the Past 5 Years	Negative	-0.000025	-0.05
Source: calculations by Will Dunning			

One way to compare the effects of the factors is to calculate how much each factor would affect the arrears rate, if their values changed by one standard deviation. Those calculations are shown in the last two rows of Table 4 (on the next page). The calculations show that both the employment rate and the rate of wage growth have effects considerably larger than the interest rate. And, the combined effect of wage growth plus the employment rate is about 7 times the effect of interest rates.

This chart compares the actual arrears rates with the rates that are “predicted” by the analysis. Overall, the actual and predicted rates are extremely close, with the exception of discrepancies in 2017 and very early in the Covid period (this isn’t surprising, given the extreme events that occurred socially and in the economy, and the exceptional economic policies that were implemented).



This analysis fully explains why the arrears rate has been very low during the past year, and, in the face of rapidly rising interest rates, the arrears rate has increased by only a minuscule amount during the past four months: strong income growth over the past few years and a still-stable employment situation have enabled mortgage borrowers to adjust to rising mortgage costs.

The last step in this analysis is to look at some what-ifs (which are illustrated in Table 4).

- At present (as of December), the arrears rate (0.151%) is exactly equal to the predicted rate.
- If the average interest rate on outstanding balances fully adjusts (to 5%), and if the other factors remain at their current (highly supportive) values, the expected arrears rate is 0.186% a small rise of 0.35 percentage points from the current actual level (and still below the average value for the analysis period, of 0.222%).

- If all of the four factors were at their average values, the expected arrears rate would be higher, at 0.222%. The current considerably lower actual arrears rate illustrates that three of the four factors (apart from interest rates) are highly favourable.
- If there is some weakening of the three positive factors, there would be a further rise in the arrears rate.
- For example, if the rate of wage growth, the employment-to-population ratio, and house price growth fall to their average levels, and the interest rate remains at 5%, the expected arrears rate would be 0.275%. This would be almost double the current rate, and above the average (0.222%) seen over the analysis period. But in a longer-term view, it would be close to average (during the past 20 years, the average has been 0.288%).
- If there is a further weakening (say, the three indicators fall to one standard deviation below average) and the interest rate stays at 5%, the expected arrears rate would be 0.322%, more than double the current rate, and noticeably above average.

<i>Scenario</i>	<i>Factors Driving Arrears</i>				<i>Simulated Arrears Rate</i>
	<i>Average Interest Rate for Outstanding Balances</i>	<i>Emp. Rate (25-54)</i>	<i>Wage Growth per 5 Year Period</i>	<i>House Price Change per 5 Year Period</i>	
Current values (1) for factors and arrears (as of December 2022)	3.58	84.6	18.9%	33.0%	0.151%
Current values, with 5% interest rate	5.00	84.6	18.9%	33.0%	0.186%
Calculated at average values for all factors	2.81	8.23	12.8%	32.9%	0.222%
5% interest rate, with average values for other factors	5.00	82.3	12.8%	32.9%	0.275%
5% Mortgage rate, other values 1 standard deviation below average	5.00	80.3	10.2%	24.0%	0.322%
Standard deviations (in percentage points)	0.287	2.0	2.6	8.9	
Estimated impact of 1 standard deviation change (in percentage points)	0.007	-0.018	-0.029	0.000	
Source: calculations by Will Dunning					
Note (1): because the arrears data reflects mortgages 3 or more months in arrears, calculations employ lagged data for the 4 factors					

## ***Conclusion***

- Mortgage stress testing regulations are highly focused on interest rates, and the possibility that rates could be higher in future.
- The analysis provided by three research projects (by the IMF, the Federal Reserve Bank of Philadelphia, and the Bank of Canada), as well as my own research, indicate that the employment situation is much more important in driving mortgage arrears. (It is likely that this also applies to the much more damaging outcomes of mortgage foreclosure and power of sale). The borrowers' incomes influence to what extent they and lenders can work together to solve problems.
- To put this another way, it has been shown that changes in ability-to-pay are much more important than changes in payments.
- Correspondingly, risk management in mortgage lending should focus on individuals' employment situations and prospects, rather than on hypothetical changes in interest rates.
- At the initiation of a new mortgage, variable rate mortgages might be assessed differently than fixed rate mortgages.
- Moreover, in the event of mortgage difficulties, problems can often be solved by selling the property (depending on how much equity is in it). Therefore, risk assessment should give consideration to how much equity the borrower has (at the initiation of the mortgage, as well as the expected amount of debt repayment that will occur by the time of renewal).

## ***Appendix 2***

### ***Stress Testing for Mortgage Transfers***

Each month, about 100,000 Canadian home owners renew their mortgages. In the past, they have been able to access a competitive mortgage market, to find the best interest rate and the mortgage features that best meet their needs.

But now, Guideline B-20 is making it difficult for many renewing borrowers to get a competitive interest rate.

Before a federally-regulated lender can accept a transfer, it has to test the borrower's ability to make the payment, at 2 percentage points above the actual contracted interest rate. So, if the contract rate is a now-typical 5%, the test is done at a rate of 7%.

Many of the borrowers who are renewing today would have borrowed five years ago, at a rate in the range of 3% to 3.5%. In a typical example, if the initial rate was 3.25% and the renewal rate is 5.0%, the payment will go up by 16%. These renewing borrowers won't like it that their payments have increased by a lot, but in most cases, their incomes will have gone up by even more: during the past five years (up to February), the average weekly wage in Canada has increased by 21%.

As a result, their actual mortgage payment as a percentage of their income will be lower than it was in 2018. In the example I'm using, the new mortgage payment would be equal to 25.1% of income, versus 26.3% in 2018. (Property taxes and utilities will add to these ratios, typically by 4 to 6 percentage points.)

But, when the borrower is tested at 2 points above the actual interest rate, the theoretic mortgage payment is 28.8% of income, which is above the figure from 2018 (26.3%) and the actual ratio for the renewal in 2023 (25.1%). Some of these people might fail the test, and be unable to transfer their mortgages.

The situation is much more challenging for people who bought two years ago. At an initial 2.0% interest rate, their cost-to-income ratio might have been 23%. Renewing at 5.0%, their ratio would jump to 28%, and the test at 7% would calculate a ratio of 33 or 34% (taxes and utilities will add to the ratios, which may result in calculated GDS or TDS ratios above the allowable thresholds). These borrowers are at a higher risk of failing the test.

If a mortgage renewer fails the test, and is unable to transfer their mortgage, there is a risk that their current lender could take advantage of their situation.

Until recently, interest rates were low and reasonably stable, and it would have been quite rare for borrowers to get trapped.

OSFI and the Bank of Canada both have data resources that could be used to investigate this. Both have previously commented that interest rates for all renewals are not materially different than rates for new mortgages, and therefore this does not appear to be a real issue. However, in the past when interest rates were changing by relatively small amounts and meanwhile incomes were growing, there would be few renewing borrowers who would fail the stress test. Consequently, analysis of interest rates for all renewers would have been unlikely to spot any problems for that small number of borrowers who

would fail the test. A proper analysis would look only at renewing borrowers who would fail the stress test, and what happened to their interest rates.

Now, with interest rates much higher than previously, there will be very large numbers of renewing borrowers whose interest rates had been in the range of 2% to 3.5%, will renew at 5% to 5.5%, and will be stress tested at 7% to 7.5%. There is now a much greater likelihood that renewers will fail the stress test and could become trapped (and therefore potentially exploited) at their current lenders.

We don't have data on how often this is happening now or how this affects interest rates that are negotiated.

But, anecdotes from mortgage professionals indicate that it is happening at this time, and the borrowers are getting hit with interest rates higher than they could negotiate by transferring to a different lender. The increments range from one-third to three-quarters of a point. Monthly payments, correspondingly, are higher than they need to be.

OSFI's mandate and the point of the regulations is to reduce risk in the financial system, which is an important goal. But, these mortgages already exist, and so this policy doesn't reduce risk, it just influences where the risks are located.

The real effect of the policy is to increase the cost of borrowing, which increases pressures on the finances of Canadians. This creates risks for the economy, which adds to risks in the financial system.

Therefore, this policy is contrary to OSFI's mandate.

The main effect of the policy is to boost the profits of the mortgage lenders (at the expense of middle-class Canadians).

OSFI's mandate does not include increasing the profits of lenders at the expense of borrowers.



## **Appendix 3**

### ***The Need to Incorporate Income Growth in Risk Assessments***

An early version of stress testing for insured mortgages was used for mortgages that had variable rates or fixed rates with terms shorter than 5 years: testing was at the posted rate for 5-year fixed rate mortgages (this started in February 2010). During that period, fixed rate mortgages with terms of 5 or more years continued to be tested at the contracted interest rates. Based on the data on arrears, this requirement does not appear to have materially affected sales, and there was very little discussion of impacts at the time.

*In fact, it might be said that this was a quite successful policy, as it encouraged first-time buyers to select a long-term fixed rate mortgage, and discouraged them from taking the risks associated with variable rates and shorter fixed-rate terms.*

After that initial term, when borrowers' changing circumstances (income growth and increased home equity) reduce their personal risks, renewals with shorter terms or variable rates become less risky as choices.

During late 2016, a policy change required stress testing for all insured mortgages. This had a substantial but short-lived negative impact: many borrowers discovered that they could avoid the stress tests by getting uninsured mortgages – by increasing their down payments to 20% (or more).

Then, at the start of 2018, the Office of the Superintendent for Financial Institutions, through its Guideline B-20, introduced a requirement for stress testing of all residential mortgages issued by federally-regulated financial institutions. The combination of the two stress tests (insured and OSFI) has had a substantial and prolonged depressive effect on home buying in Canada (this can be seen in the two charts in Appendix 4).

This effect from the stress tests is additional to any lingering effects arising from earlier policy changes. The combined negative impacts of multiple policy changes have been quite large, as can be seen in Appendix 4 (in the comparison of sales in the US and Canada).

Discussion of the stress tests needs to recognize that they do analysis in the present for an event (mortgage renewal) that will occur in the future. The design of the stress tests considers only the possibility that interest rates will be higher in future, but does not take account of three additional considerations that will influence the impact of that future renewal (principal repayment, income growth, and increased home equity).

#### ***Simulation of Stress Test Scenarios***

This analysis starts with a scenario for stress testing that might have occurred five years ago, in early 2018.

**For simplicity, this analysis excludes the non-mortgage housing costs that would be included in the calculation of GDS and TDS ratios. Therefore, the GDS and TDS ratios that would be**

**calculated by a lender would be higher than the numbers shown below, typically by 4 to 6 percentage points.**

Assumptions that might have been used as of early 2018 include:

- The contract interest rate is 3.25% (which at that time was a typical “special offer” rate for a fixed rate mortgage with a 5-year term).
- The mortgage amount is 4.5 times the borrower’s income, which is the threshold that federal government officials consider elevated.
- In this analysis, the income is assumed to be \$100,000 per year.
- The amortization period is 25 years. It is assumed that no additional payments are made by the borrower (although consumer surveys have found repeatedly that each year about one-third of mortgage borrowers take actions that shorten actual amortization, including making lump sum payments and/or voluntarily increasing their regular payments to more than is required).
- At the end of the first 5-year term, 14.1% of the mortgage will have been repaid (and more if the borrower has made any additional payments).

The calculations show the following:

- The initial mortgage payment (\$2,187.75 in this calculation) will be equal to 26.3% of the borrower’s income.
- The stress test analysis (at 2 points above the contract rate, or 5.25% in this case) will calculate a mortgage payment of \$2,681.63, which is equal to 32.2% of the borrowers’ income.
- But, in five years, a renewal at a rate of 5.25% would result in an actual monthly payment of \$2,591.99. So, the stress test would over-estimate the rise in the payment, by 3.5% (\$89.64 per month in this example). Correspondingly, the stress test would over-estimate the ratio-to-income: in this example, the ratio should be calculated as 31.1%, rather than the 32.2% that would be calculated.
- This is a relatively small error, which might affect the qualification of a few potential borrowers.
- A larger consideration is that it very likely that during the 5-year term, the borrower’s income will have increased.
- Data from Statistics Canada’s Labour Force Survey shows that the average weekly income in Canada rose by 27% (2.42% per year) during the 10 years from 2007 to 2017.
- That factor could have been applied in this analysis. If the borrowers’ initial income was \$100,000, by the time of renewal in 5 years, it would be \$112,700.
- A stress test that made reasonable assumptions about the renewal (the future remaining principal and amortization period, and the future income), at the same interest rate that was used in the stress test (5.25%, or a 2-point increment above the contract rate), would produce the following estimates.
  - At renewal, the monthly mortgage payment would be \$2,599.91.
  - The borrowers’ income would be \$112,699.99.
  - The expected future mortgage cost ratio would be 27.6%.
  - The stress test would have calculated a much higher ratio (32.2%).
  - The failure of the stress tests to consider incomes at the time of renewal would unduly disqualify some number of potential borrowers.

These undue results could be corrected in at least two different ways:

1. In addition to using the qualifying rate at 2 points above the contract rate, the calculation should be based on the future remaining mortgage principal and a reasonable expectation about the borrower's future income. As is discussed above, in this scenario, the expected future cost-to-income ratio would be calculated as 27.6%, which would be a small increase from the initial ratio of 26.3%.
2. The second approach would find the interest rate increment that would produce the same result (in this case, the expectation of a 27.6% cost-to-income ratio in five years). This would produce a shortcut that can simulate the combined effects of a 2-point rise in the interest rate, principal repayment, and income growth. ***Using the same assumptions as above, these calculations result in an increment of 0.47 percentage points above the initial contracted interest rate.*** An increment of 0.75 points would more-than-adequately approximate the effect of a 2-point rise in 5 years. This analysis is based on an initial mortgage term of 5 years. Other initial terms would result in different outcomes.

#### Calculations for a shorter initial term

Taking the same approach as above, for a purchase made in early 2021, but with the renewal to occur in two years (now), the calculations provide quite different results. Taking the same assumptions as before that the initial mortgage was 4.5 times the borrower's income, at a 2.0% contracted interest rate, the initial mortgage-cost-to-income ratio would be 22.9%. Applying the mortgage stress test (using as the qualifying rate the posted rate of 4.79%), the ratio would have been calculated as 30.8%. After non-mortgage costs were added, the stress test would have disqualified some potential buyers. But, if it is assumed that income would increase by the rate seen over the prior 2 years (2.87% per year at that time), the future cost-to-income ratio would have been calculated as 28.5%, versus the 30.8% that would have been calculated by the in-force stress tests. This amended stress test would have continued to disqualify some potential buyers, but the impact would be less severe.

#### Potential outcomes for renewals occurring now

In prior discussion of the stress tests, I have argued that if interest rates do indeed increase by a substantial amount, then in all likelihood the economy will be considerably stronger and incomes will have increased more rapidly than previously. This argument has been borne-out in what is happening now. During the past five years, the average weekly wage rate in Canada has increased by 21.2% (an average of 3.92% per year, far above the 2.42% rise that is used in the initial calculations above). While interest rates have increased sharply, that has occurred because the economy is very strong, and this has resulted in strong wage growth.

Today, a typical special offer rate for a 5-year fixed-rate mortgage is in the area of 5.0% (below the 5.25% rate that the stress tests would have been assumed 5 years ago). At that 5.0% interest rate, in this example, the actual mortgage payment at renewal would be \$2,539.56 per month. But, the current annual income is higher than had been expected, at \$121,220. The new ratio of mortgage cost to

income would be 25.1%, actually lower than the initial actual rate of 26.3% that would have been calculated five years ago.

***On this basis, the revised stress testing protocol that is suggested here (a rate increment of 0.75 points above the contracted rate) would have provided more-than-ample protection against renewal risk.***

Mortgages attainable in the current environment

A further analysis looks at a purchase that might be contemplated today. This analysis applies the stress test in the present, based on the current interest rate (5.00%) plus a 2-point increment. Assuming once again that the mortgage amount is equal to 4.5 times the borrower’s income, the initial ratio of mortgage-cost-to-income would be 31.4% (and the GDS ratio would be even higher). This largely explains the sharp reductions for sales of new and existing homes that have occurred in the past year.

At a 2-point increment above the actual contract rate, the current stress test would calculate a ratio of 37.8%. The actual GDS ratio (once costs for taxes and utilities are added) would be even higher, and it is unlikely that this purchase could be funded today via an insured mortgage or a federally-regulated lender.

But, adjusting the calculations to include income growth and repayment of principal:

- Based on the same assumption of modest income growth (2.42% per year): at a renewal in 5 years at an assumed rate of 7.00%, the future cost-to-income ratio would be 32.6%, slightly higher than the initial actual ratio of 31.4%.
- The interest rate increment that could be used today to take account of income growth and principal repayment is calculated as 0.39 point.
- ***In this analysis of the current situation, making the calculations using an increment of 0.75 point above the contract rate would, once again, more than adequately anticipate the effects of a 2-point rise in the rate.***

Conclusion

To simulate the impact of a future 2-point rise in rates at renewal, an increment of 0.75 points above the contracted interest rate would be adequate for a 5-year fixed rate mortgage. For each year that the term is shorter than 5 years, the increment could be raised by a quarter point, and for each year that the term is longer than 5 years, the increment could be reduced by a quarter point.

<b>Indicated Interest Rate Increments (Above Contracted Interest Rates), to Simulate the Effects of a 2-Point Rate Rise at Renewal</b>	
<i>Initial Term</i>	<i>Increment</i>
5 years	0.75
4 years	1.00
3 years	1.25
2 years	1.50
1 year	1.75
Variable Rate Mortgage	2.00
Source: calculations by Will Dunning Inc.	

However, the assumption of a 2-point rise may be inappropriate in the current high-rate environment. If the assumption is that future rates might be one-half point higher (5.5% in this case), and income growth is assumed to be at a moderate rate (2.4% per year), the estimated future cost-to-income ratio would be 29.0%. This would be lower than the actual initial ratio (31.4%), and therefore, a borrower with a 5-year fixed rate mortgage could reasonably be tested at the actual interest rate. A borrower with a variable rate mortgage might be tested at the 5.5% rate, or the actual initial rate, if it is higher.

## **Appendix 4**

### **A Decade of Policy Escalation**

This discussion is extracted from a longer report that I published in February:

[https://www.wdunning.com/files/ugd/ddda71\\_6453de6f4f384ee99f6633e2e0504cab.pdf](https://www.wdunning.com/files/ugd/ddda71_6453de6f4f384ee99f6633e2e0504cab.pdf)

To summarize the arguments and conclusions in that longer paper:

- Since the summer of 2012, a series of changes in federal mortgage regulations have had the effect of increasingly impairing the ability of Canadians to make housing choices that they see as in their best interests. As is discussed in the longer report, those policy changes have varied in their intensity and in their impacts.
- As I discuss below, the decade of policy escalation has reduced home buying transactions (for resale homes, and very likely for new homes as well).
- Discussions often assert that the mortgage regulations have reduced housing demand. This is often portrayed as a beneficial outcome, since housing demand is considered to be over-heated.
- But, reducing transactions is not the same as reducing demand.
- In these discussions, demand should be seen as the requirement for additional housing that results from the growth of our population.
- With that understanding, the mortgage regulations have done nothing to reduce the pressures within Canadian housing markets. Housing requirements have continued to expand, creating pressures. The regulations have just caused the pressures to change locations within the housing system (and within the financial system). In my reports, I have discussed this migration of pressures using the analogy of the arcade game “whack-a-mole”.
- Examples of the relocation of pressures include:
  - Since the regulations mean that fewer Canadians have been able to buy homes, pressures have been raised within the rental sector.
  - Increased rents (and growth in values of investment properties) have encouraged more buying by investors. In some commentary, investment activity is perceived to make it more difficult for owner-occupants to buy. I argue that there is a causal arrow, but it points in the opposite direction: the regulations that inhibit potential owner-occupants have created incentive and opportunity for increased investment buying.
  - Exceptionally low interest rates during 2020 until early 2022 (plus the desire of many Canadians to adjust their housing situations to support social-distancing) caused the housing market pressures to migrate towards the ownership sector.
  - Now, with elevated interest rates, the pressures have lessened in the ownership sector but intensified for renting.
  - Some buyers have chosen to evade the mortgage regulations by borrowing from non-federally-regulated lenders. This often results in interest rates that are higher than could be obtained via a major mainstream lender. This is likely to have negative consequences for the economy, which may raise risks within the financial system. There are also risks that alternative lenders could experience reduced access to funding, and this may result in adverse outcomes at renewal time. This raises risks for the economy and the financial system.

- These outcomes that result from federal mortgage regulations, which raise risks for the economy and the financial system, are therefore counter-productive to OSFI's mandate.

### ***Impacts of the Regulations on Housing Supply***

It is now quite widely agreed that housing supply is inadequate in Canada (although there is a wide range of opinions on how large the supply deficits are). There is also some agreement on causes of the supply shortages. Most of the commentary points towards municipal land use policies. I have considered some additional causes. Tightening of mortgage regulations is one of the major factors. In several reports, I have shown this list of impediments:

- Naturally-occurring physical constraints.
- Land-use plans that limit uses of land that has development potential.
- Delayed approvals.
- Delayed installation of infrastructure.
- Costs imposed by governments on new construction (from a large list of fees and charges), which have increased very rapidly over time. Builders have to delay, so that attainable prices can catch-up to their increased costs.
- Decisions by land owners about whether to take actions – to sell or develop their lands. (This issue gets very little attention, but it ought to be investigated.)
- Mortgage regulations that suppress home buying: these reduce sales of new housing, which impairs future supplies.
- Labour supply: commentary from several communities suggest that housing construction is being constrained by shortages of skilled trades. A related concern is that in places where large increases in construction are needed, the local cost of living makes it difficult to attract labour.
- Looking forward, given the need to increase housing starts by a large amount, supplies of building materials and equipment could emerge as challenges.

Recent events require the addition of three additional factors that inhibit new housing supply:

- Federal and provincial policies that prevent or discourage non-Canadians from investing in real estate.
- Higher interest rates that are resulting in sharp reductions in new home sales, which mean that new construction will be reduced during the coming months.
- To the extent that the higher interest rates impair the employment situation and/or incomes, new home sales will be negatively affected.

My evidence that a decade of escalating mortgage regulations has impaired new housing supply is as follows.

Housing markets in Canada and the US are subject to economic influences that are quite similar, in terms of the two main drivers of sales - interest rates and employment trends. The population of Canada is equal to about 11% of the US. Therefore, the chart to the right scales the Canadian data (on the right side) at 11% of the US. From the start of 2008 to mid-2012, resale activity in Canada was quite close to 11% of the US figures, and averaged 10.7% (the next chart shows the ratios). But, since mid-2012, the ratio has been substantially lower than 11% most of the time. (This date coincides with a policy change that eliminated 30-year amortization periods for insured mortgages.) For the entire period from July 2012 to February 2023, the ratio averaged 9.6%.



As shown in this chart, there was a brief period when the ratio was close to the expectation: during mid-2020 to mid-2021 the average was 11.1%. At that time, the incidence of Covid-19 in the US was three times worse than in Canada, and Covid's economic impacts were considerably more severe in the US (therefore, we should have seen a ratio well above 11% during that brief period). As can be seen, the ratio retreated during 2022. For the full year, the average was 9.8%. For the past six months (up to this February) the average was 9.5%



Most of the time during the past decade, economic conditions have been quite similar in Canada and the US. Based on the US data, Canadian sales should have totaled slightly more than 6.0 million during July 2012 to the present. The actual total was about 5.45 million, for a shortfall of about 600,000 sales. This data implies that during the past decade, sales of existing homes in Canada have been about one-tenth lower than they should have been, and that tightening of mortgage regulations has been a major contributor to that shortfall.

This data is for resale market activity. There has likely been an impact on sales of new homes, constraining housing supply (due to the increased difficulty of obtaining mortgage financing). If the one-tenth reduction also applies to new home sales (and this seems a reasonable assumption), then during the past decade new housing construction in Canada was likely in the order of 200,000 dwelling units lower than it should have been, as the consequence of changing mortgage regulations.

Thus, the escalating mortgage regulations have added to the housing market pressures that have been experienced in Canada. This has added to economic risks and therefore to risks within the financial system.