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Residential real estate sales in 2018: The relationship between house prices and incomes

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Residential real estate sales in 2018: The relationship between house prices and incomes

by **Annik Gougeon** and **Oualid Moussouni**
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Overview

The Canadian Housing Statistics Program (CHSP) uses new sales data to explore property and buyer characteristics in a three-part series that focuses on Nova Scotia, New Brunswick and British Columbia. As the third and final part of this series, this article examines the relationship between house prices and incomes through the price-to-income ratio of properties sold from January 1 to December 31, 2018.

Key findings

- The median price-to-income ratio in British Columbia was 5.4, more than double that of Nova Scotia and New Brunswick.
- Properties purchased in the largest cities had the highest price-to-income ratios. This was most pronounced in the Vancouver census metropolitan area, where the median price-to-income ratio was 7.4.
- The lowest-income buyers purchased properties with the highest median price-to-income ratios, reaching 18 in British Columbia, compared with less than 4 in New Brunswick and Nova Scotia.
- In British Columbia, properties purchased by at least one immigrant had a median price-to-income ratio over 50% higher than that of properties purchased by non-immigrants.

Introduction

For the first time, data from the Canadian Housing Statistics Program (CHSP) is providing information on the buyers of residential real estate and the properties they purchased from January 1 to December 31, 2018 in Nova Scotia, New Brunswick and British Columbia. The first part of this three-part series provided an overview of the sold properties' characteristics and compared them with the characteristics of all other residential properties, including the geographic distribution of sales, property types, sale prices and living areas.

The second part of the series focused on the characteristics of buyers, including sex, family type, number of buyers as part of a sale, first-time home buyers and immigration status.

As the third and final part of this series, this article examines the relationship between the purchase price of properties and the income of buyers[1] by calculating the price-to-income ratio (PIR) at the property level. The heterogeneity of this ratio across income quintiles is examined and the PIR of properties purchased by immigrants in British Columbia.

1. The measure of income used in this article is the total individual income of all buyers on the title of the property purchased. As such, the income of all individual resident owners who filed their taxes in 2018 is taken into account in the calculation of the PIR.

Infographic 1
How the price-to-income ratio is calculated

Source: Statistics Canada, Canadian Housing Statistics Program (CHSP).

In Canada, housing affordability has been historically measured by the shelter-cost-to-income ratio (STIR). The STIR is the average share of before-tax household income spent on shelter costs and has a threshold of 30%, meaning that housing is considered as unaffordable when households spend more than 30% of their income on shelter costs (Statistics Canada, 2019a). To expand on this measure of affordability, the Canada Mortgage and Housing Corporation (CMHC) introduced the housing hardship measure, where a household is in housing hardship when there is not enough disposable income after housing expenditures to afford other basic living expenses (CMHC, 2020). This measure differs from the STIR by taking into account the cost of non-shelter items, different types of households such as households with children, and taxes paid and benefits received.[2]

The PIR presented in this article is a new measure for the Canadian context that builds on the STIR and the housing hardship measure, as it can be used to monitor housing affordability at the time of purchase. By linking the price of the property sold to the income of its buyer, the PIR provides an indication of the financial burden faced by home buyers when purchasing residential real estate. A higher PIR indicates a larger financial burden, requiring buyers to be more indebted or to rely on additional capital for their purchase.[3] This measure can be evaluated over time, with the findings in this article serving as a point of comparison to quantify the effects of the COVID-19 pandemic on housing affordability within Canada.

Internationally, the Organisation for Economic Co-operation and Development (OECD) uses an aggregated price-to-income ratio measure to monitor housing affordability (OECD, 2021). The ratio used by the OECD is calculated as the house price index divided by the disposable income per capita. The income measurement includes all persons in a region, regardless of whether they purchased a property.[4] Comparisons are made between countries to evaluate access to housing markets and the effectiveness of housing policies in addressing affordability.

2. The CMHC has shown that the housing hardship rate was approximately 9% in 2017, while approximately 11% of households had an STIR over 30% (CMHC, 2020).
3. However, the PIR does not provide details on the source of funds at the time of purchase.
4. Using this ratio, the OECD showed that there were steady increases in the PIR in Canada before the COVID-19 pandemic. From 2020 until the first quarter of 2021, the OECD found that the PIR in Canada fell before rising above pre-pandemic levels, a trend that was also observed in Greece, the United Kingdom, Japan, Korea and Spain (OCED, 2021).

This article furthers the OECD's approach by looking strictly at the income of property buyers, as opposed to including all persons in a region. Additionally, the PIR in this article uses the income data of the buyers of a property as opposed to national disposable income per capita. A comparison of PIRs by geographical areas, where market dynamics can vary drastically, unveils differences in real estate markets across provinces and cities that are often masked when only looking at the national or provincial levels.

This article includes residential properties sold in a market sale from January 1 to December 31, 2018, purchased by individual (persons) resident buyers. The first section explores the heterogeneity of the PIR of properties purchased in Nova Scotia, New Brunswick and British Columbia. The second section furthers this analysis by examining the ratio across income quintiles. Findings on the PIR of properties purchased by immigrants in British Columbia are also presented. The last section concludes with a summary of the findings in this three-part series.

Section 1: Price-to-income ratios in Nova Scotia, New Brunswick and British Columbia

Vancouver is the least affordable metropolitan area examined

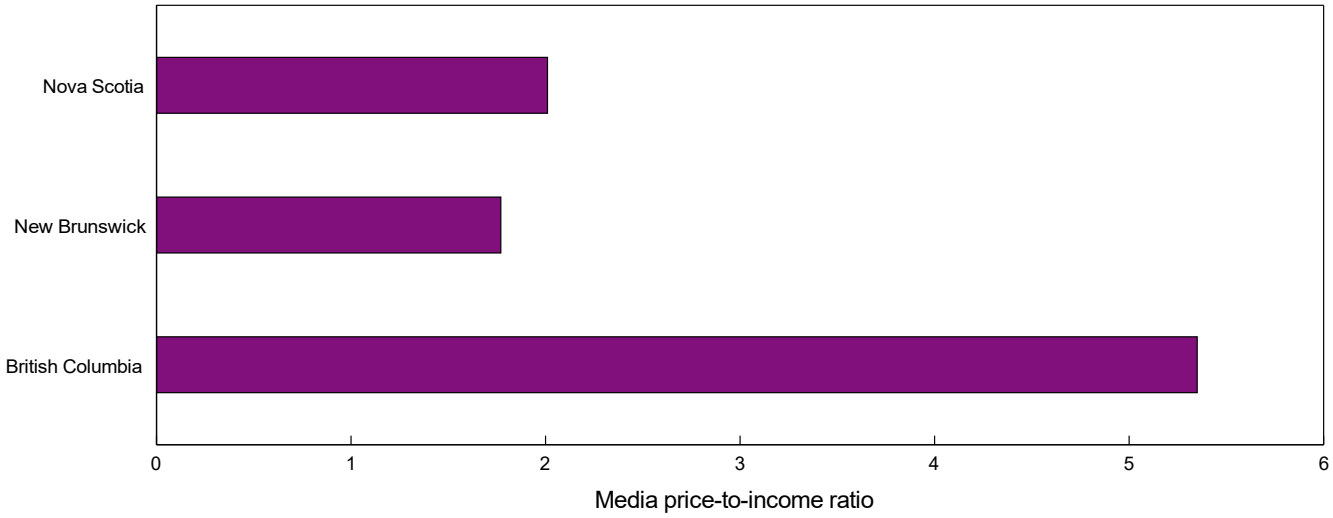
British Columbia had a median price-to-income ratio (PIR) more than double that of Nova Scotia and New Brunswick (Chart 1). This shows that buyers in British Columbia had to commit a larger share of their income to housing, relative to those purchasing properties in Nova Scotia and New Brunswick, and points to housing affordability differences across the provinces. These findings are consistent with previous results, which showed that properties in British Columbia had a significantly larger assessment value-to-income ratio compared with properties in Nova Scotia (Al-Tawil, 2019).[5]

British Columbian buyers faced higher PIRs, despite earning median incomes 1.2 times higher than in Nova Scotia and 1.3 times higher than in New Brunswick. The contrast was greater when looking at median house prices, where the median price of properties purchased by buyers in British Columbia was 3.1 times higher than in Nova Scotia and 3.8 times higher than in New Brunswick. This shows that even though the income was higher in British Columbia, it was not enough to offset the high prices of properties. Therefore, buyers in British Columbia needed significantly more capital to purchase a property, or relied more on debt, than buyers in Nova Scotia and New Brunswick.[6]

5. The assessment value-to-income ratio was calculated as the ratio between the assessment value of a property and the income of its owners for a given reference period (Al-Tawil, 2019). By contrast, this article advances this measure by calculating the PIR, which links the price of the property purchased to the income of its buyers at the time of purchase.

6. The PIR does not provide a complete picture of all the financial sources used in the purchase. The PIR does not take into account other forms of wealth such as inheritances, capital gains, savings, unreported income and financial support from individuals not included in the title. These sources are particularly important for the down payment amount. Moreover, in the case of a property where at least one of the purchasers is a non-resident, their income is not captured in the calculation of the PIR, nor the money provided by non-individual entities, even if these buyers appear on the property title.

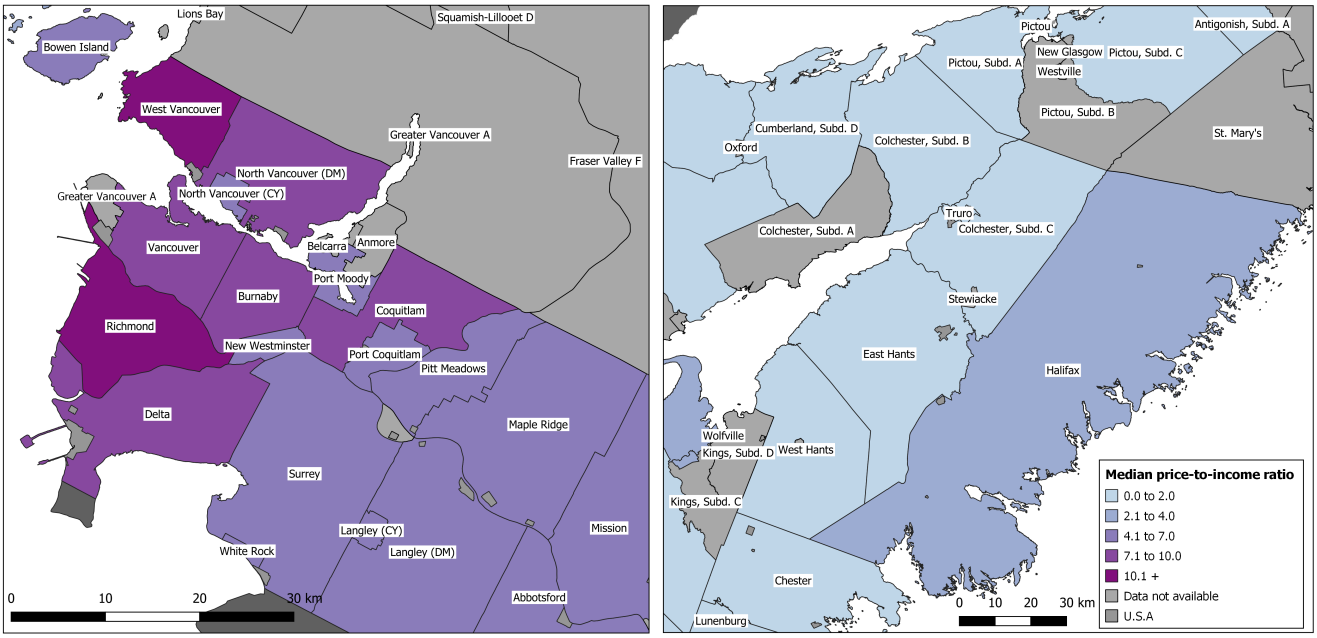
Chart 1
Price-to-income ratio in Nova Scotia, New Brunswick and British Columbia



Source: Statistics Canada, Canadian Housing Statistics Program (CHSP).

In the Vancouver census metropolitan area (CMA), the median PIR was 7.4, considerably higher than the Halifax and Moncton CMAs, where the PIRs were less than 3. Additionally, as shown in Map 1, census subdivisions (CSDs) that are closer to the core of the largest CMAs had a higher median PIR compared with CSDs that were farther from the cores in both British Columbia and Nova Scotia.

Map 1
Median price-to-income ratio ranges in and surrounding the Vancouver and Halifax census metropolitan areas by census subdivision



Source: Statistics Canada, Canadian Housing Statistics Program (CHSP).

In the Vancouver CMA, high property prices were not offset by high incomes, which led to high median PIRs. Of note, the CSDs of West Vancouver (17.2) and Richmond (12.2) had the highest median PIRs of all CSDs observed. Median sale prices in the Richmond CSD ($683,000) were equivalent to those of the broader Vancouver CMA. However, buyers in the Richmond CSD had the lowest median income ($57,900) in the Vancouver CMA. By comparison, buyers in the West Vancouver CSD earned over double the income of buyers in the Richmond CSD, but purchased properties with a median price over three times higher ($2,330,000).[7] The decoupling of property prices and income in the Vancouver CMA may signify that wealth, which is not represented in the income measure, plays an important part in the purchase of properties or that higher levels of indebtedness are required to purchase a home. Additionally, the income measure excludes capital gains and includes only the income reported the year the property was purchased, leaving out all unreported income.

Vacant land properties have the lowest price-to-income ratios

The median PIRs are similar across the different types of properties purchased within each province, with the exception of vacant land, as shown in Table 1. In Nova Scotia and New Brunswick, vacant land properties had a median PIR of 0.2, likely a result of the low price of vacant land.

Buyers may seek to purchase vacant land as an investment, as this property type was more likely to be purchased by at least one multiple-property owner, compared with other property types. This was most pronounced in Nova Scotia, where 83.2% of vacant land properties were purchased by at least one multiple-property owner, compared with 32.8% of single-detached houses. Additionally, buyers of vacant land had a higher median income than those who purchased other property types in New Brunswick and the second-highest median income in British Columbia, following those who purchased properties with multiple units.

Table 1
Price-to-income ratio by property type and province

	Median price-to-income ratio		
Property type	**Nova Scotia**	**New Brunswick**	**British Columbia**
Single-detached house	2.2	2.0	5.2
Semi-detached house	2.4	2.4	5.4
Row house	2.9	2.5	5.6
Condominum apartment	2.6	2.3	5.4
Vacant land	0.2	0.2	1.6

Source: Statistics Canada, Canadian Housing Statistics Program (CHSP).

7. Differences in property types were also observed between the Richmond and West Vancouver CSDs. The majority of properties sold in the Richmond CSD were condominium apartments, while the majority of properties sold in the West Vancouver CSD were single-detached houses.

Section 2: Analysis of the price-to-income ratio by income quintiles

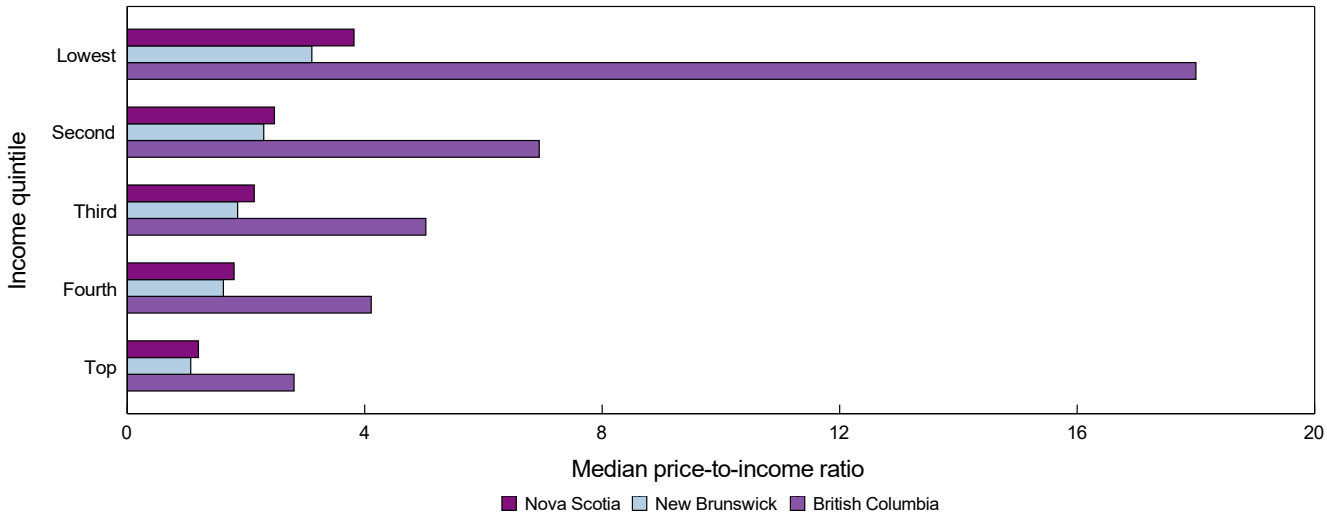
This section categorizes the buyers into five equal groups based on their income (quintiles, hereafter), calculated independently for each province.[8] This allows for a comparison of property prices and buyer characteristics across different levels of income at the time of purchase and brings new insights by geographical areas.

Buyers in the lowest income quintile purchase properties worth 29 times their income in Vancouver

Buyers in the lowest quintile had the lowest income relative to the price of the properties they purchased, resulting in the highest median PIR of all the quintile groups in the three provinces. Of note, the median PIR of properties purchased by those in the lowest income quintile was over four times higher in British Columbia than in Nova Scotia and New Brunswick, as shown in Chart 2.

The median PIR of the lowest quintile was especially high in the Vancouver CMA, reaching 28.6. By comparison, the lowest quintile had lower median PIRs in the Halifax (7.3) and Moncton CMAs (4.4). The ratios were significantly lower for those in the top income quintile in the Vancouver (3.9), Halifax (1.8) and Moncton (1.4) CMAs.

Chart 2
Price-to-income ratio by income quintile in Nova Scotia, New Brunswick and British Columbia



Source: Statistics Canada, Canadian Housing Statistics Program (CHSP).

Buyers in the lowest quintile are older and more likely to be repeat buyers

Different characteristics can be observed across income quintiles. For instance, Al-Tawil (2019) used owner-level data to show that properties of those receiving pension income were more prevalent in the lowest income quintile. The data showed that over half of the properties in the Vancouver, Toronto and Halifax CMAs in the lowest income quintile were owned by individuals receiving pension income, compared with around a quarter of those in the highest income quintile.

8. These quintiles are unique at the provincial level. Refer to Table A.1 in the appendix for income quintile ranges in Nova Scotia, New Brunswick and British Columbia.

Buyers in the lowest income quintile were older than those in the other quintiles. In British Columbia, the median age of the buyers in the lowest quintile was 50, while that of buyers in the third and fourth quintiles was 41. The Survey of Financial Security showed that net worth tends to increase with age, as senior-led families reported the highest median net worth in 2019 (Statistics Canada, 2019b). This suggests that since buyers in the lowest income quintile are older, they may have had additional time to accumulate wealth, which could result in more capital saved for the purchase of their property.

In British Columbia, the lowest income quintile also saw the highest share of properties purchased by repeat buyers,[9] with a proportion over 90%. In Nova Scotia, the lowest income quintile had the second highest share of properties purchased by repeat buyers (80.5%), following those in the highest income quintile (88.9%). This further suggests that buyers who earned the lowest income may have accumulated wealth through the sale of a previous home, especially in British Columbia.

In British Columbia, buyers in the lowest income quintile purchase more expensive properties than those in the second and third quintiles

The high PIRs across all income quintiles in British Columbia were likely driven by the higher property prices, as shown in Table 2. This was especially true in the lowest income quintile, where buyers in British Columbia had the same median income as those in the other two provinces, but purchased properties that were significantly more expensive.

In Nova Scotia and New Brunswick the median sale price of the properties purchased increases with income, with the lowest income quintile acquiring the properties with the lowest prices. Conversely, in British Columbia, the properties purchased by the lowest quintile were priced 10.9% higher than the properties purchased by the second quintile and 1.8% higher than the third quintile.

Table 2
Sale price and income by income quintile in Nova Scotia, New Brunswick and British Columbia

	Median sale price	Median income
Income quintile	dollars	
Nova Scotia		
Lowest	113,000	30,000
Second	150,000	59,100
Third	180,000	84,700
Fourth	217,000	120,000
Top	249,000	189,000
New Brunswick		
Lowest	85,000	30,200
Second	121,000	52,700
Third	142,000	75,800
Fourth	174,000	107,000
Top	197,000	171,000
British Columbia		
Lowest	499,000	29,800
Second	450,000	65,500
Third	490,000	97,600
Fourth	565,000	137,000
Top	673,000	223,000

9. Properties purchased by repeat buyers are identified as properties where none of the buyers claimed the home buyers' amount, which is a federal tax incentive for first-time home buyers.

Source: Statistics Canada, Canadian Housing Statistics Program (CHSP).

Properties purchased by immigrants in British Columbia have a higher price-to-income ratio

Taking a closer look at British Columbia reveals that properties purchased by at least one immigrant had a higher median PIR (7.3) compared with properties purchased by non-immigrants (4.7). Differences are observed across all income quintiles, as shown in Table 3. The largest difference was observed in the lowest income quintile, where properties purchased by at least one immigrant buyer had a PIR (26.5) over double that of properties purchased by non-immigrants (13.1).

When the purchase involved at least one immigrant, the median price of properties purchased by the lowest income quintile was 15.5% higher than the second, and 7.8% higher than the third income quintile. Interestingly, when the purchase did not involve an immigrant, buyers in the lowest income quintile purchased properties with the lowest median price.

There were important differences between the ages of the buyers in the lowest income quintile. The median age of buyers, when at least one immigrant buyer was involved in the purchase of the property, was lower (47), compared with the non-immigrant group (54). No significant age differences were observed in the other income quintiles.

This reinforces the notion that income does not always provide a complete measure of an individual's ability to purchase a home. Many demographic or socioeconomic factors such as age, not captured in income measures, may also contribute to the differences observed.[10]

Table 3
Price-to-income ratio (PIR) by income quintile and immigration status in British Columbia

	No immigrant buyers			At least one immigrant buyer		
	Median PIR	Median income	Median price	Median PIR	Median income	Median price
Income quintile		dollars			dollars	
Lowest	13.1	32,300	396,000	26.5	26,600	625,000
Second	6.3	65,600	405,000	8.3	65,300	541,000
Third	4.6	97,800	450,000	6.0	97,200	580,000
Fourth	3.9	137,000	530,000	4.8	136,000	650,000
Top	2.7	224,000	639,000	3.3	219,000	765,000

Source: Statistics Canada, Canadian Housing Statistics Program (CHSP)

Considerable literature on Canadian immigration (Haan, 2007; Ley, 2007; Rea et al., 2008) highlights the propensity of immigrants to purchase real estate. Using data from the Survey of Financial Security, Gellatly and Morrissette (2019) showed that housing assets comprised a larger share of average wealth among immigrant families compared with Canadian-born families. According to Morissette (2019), the increase in housing wealth was more important for immigrant families relative to non-immigrants. The same study showed that a lower proportion of immigrants invest in registered pension plans compared with Canadian-born individuals. Therefore, immigrants may leverage investments in housing as a retirement asset more than non-immigrants, which can lead to differing home buying preferences.

Conclusion

10. Examples of differences between immigrant and non-immigrant buyers are available in "Residential real estate sales in 2018: Who is purchasing real estate?".

This three-part series examined the characteristics of home buyers and the properties they purchased from January 1 to December 31, 2018, with a focus on Nova Scotia, New Brunswick and British Columbia.

The first part of this series found that British Columbia had the most active housing market of the provinces examined. Vacant land, a key input in housing supply, was most expensive in British Columbia, where homes were also most expensive. Meanwhile, in Nova Scotia and New Brunswick, properties sold in the reference period had larger living areas relative to other properties.

The second part of this series looked at the characteristics of home buyers, showing that home buyer preferences are shaped by a multitude of socioeconomic factors. In particular, the majority of sales in the three provinces involved more than one buyer, highlighting possible challenges faced by single individuals in becoming homeowners. Additionally, the income gap between first-time home buyers and repeat buyers in British Columbia may point to the difficulties of entering the real estate market in areas where property prices are higher. Finally, immigrants purchased more expensive properties compared with non-immigrants. Properties purchased by immigrants were closer to city centres where there is broader access to social services, community support and job opportunities.

The last part of this series examined housing affordability through the median price-to-income ratio. The divergence between property prices and incomes in some areas demonstrated that sources other than income can play an important role in homeownership, especially in the Vancouver CMA. Areas with high price-to-income ratios pointed to the increased financial burden placed on buyers, and the higher capital requirements to purchase a property. Another important consideration not captured in the income measure was accumulated wealth, acquired through previous homeownership, savings or financial support from individuals not included on the title. Examining these other factors would provide a more complete picture of housing affordability.

Note to readers

The data used in this study are compiled from the Canadian Housing Statistics Program (CHSP) and include data on properties sold from January 1 to December 31, 2018, which are linked to data for the reference year 2019. These data are integrated with the Longitudinal Immigration Database and the T1 Family File for tax year 2018.

The analysis in this article focuses on the properties sold in market sales, which involve unrelated and independent parties. Properties sold in non-market sales, such as sales by related parties, sales of special interest, sales of part-interest, forfeitures and foreclosures, are not included. The data is restricted to buyers who are individuals and who filed a T1 tax return form in 2018. Non-individual buyers (such as firms and governments) and non-resident buyers are not included. There may be more than one buyer per property.

Multiple properties may be included in the same sale, where one price was paid for multiple properties. A price adjustment is applied to these properties to estimate the price paid for each individual property.

Properties purchased by repeat buyers are identified as properties where none of the buyers claimed the home buyers' amount (HBA). Claimants of the HBA are individuals who claimed the amount ($5,000) in their federal income tax return for the taxation year in which the home was acquired. Previous CHSP releases identified HBA claimants only. As such, including those who purchased a property with at least one HBA claimant broadens the definition of first-time home buyers. According to the Canada Revenue Agency rules, the claimant and their spouse must not have lived in another home they owned during the preceding four years and must intend to occupy their new home within one year of purchasing it.

Geographical boundaries

The CHSP disseminates data based on the geographical boundaries from the Standard Geographical Classification 2016.

Definitions

Price-to-income ratio refers to the ratio between the sale price of the property and the income of its buyers, reported at the property level. That is, the income of buyers is measured as the sum of the individual income of all buyers on the title of the property purchased.

Sale of property refers to whether a property had a transfer of ownership from one party to another party through a contractual agreement. A property is considered to have been sold on the date that the property was transferred to, recorded in, registered in or otherwise carried in the name of the party who purchased the property.

Market sale refers to an arm's length transaction where all parties act independently with no influence over the other.

Non-market sale refers to non-arm's length transactions, which includes distressed sales, foreclosures, trade and forfeitures, sales of part-interest, and special interest sales.

Property refers to non-arm's length transactions, which includes distressed sales, foreclosures, trade and forfeitures, redemptions, sales of part interest, and special interest sales.

Sale price of property refers to the dollar amount set forth during the sale of the property as per the contractual agreement.

Total income includes income reported by tax filers from any of the following sources: employment income; dividends and interests; government transfers (including non-taxable income); private pensions; registered retirement savings plans; and other income such as net limited partnership income, rental net income, alimony, registered disability savings plans and other income (line 130 of the T1 form). It excludes veterans' disability and dependant pensioners' payments, war veterans' allowances, lottery winnings, and capital gains.

Appendix

Table A.1
Total before-tax income ranges by income quintile in Nova Scotia, New Brunswick and British Columbia

	Nova Scotia	New Brunswick	British Columbia
Income quintile	**Total before-tax income of all buyers by quintile**		
Lowest	Less than or equal to $45,470	Less than or equal to $42,070	Less than or equal to $49,140
Second	Greater than $45,470 and less than or equal to $72,050	Greater than $42,070 and less than or equal to $64,020	Greater than $49,140 and less than or equal to $81,370
Third	Greater than $72,050 and less than or equal to $99,880	Greater than $64,020 and less than or equal to $89,260	Greater than $81,370 and less than or equal to $115,270
Fourth	Greater than $99,880 and less than or equal to $145,130	Greater than $89,260 and less than or equal to $131,340	Greater than $115,270 and less than or equal to $166,120
Top	Greater than $145,130	Greater than $131,340	Greater than $166,120

Source: Statistics Canada, Canadian Housing Statistics Program (CHSP)

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