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Income Inequality in Canada

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Abstract

Concerns over rising inequality have heightened in the years following the 2007–09 global financial crisis and, more recently, with the COVID-19 pandemic. This staff discussion paper reviews the historical facts regarding income inequality in Canada, comparing Canada with the United States and reviewing briefly what the literature says about the most likely drivers of the rise in inequality. Data show that income inequality in Canada increased substantially during the 1980s and first half of the 1990s but has been relatively stable over the past 25 years. This increase was felt mainly by low-income earners and younger people, while older people benefited from higher retirement income. Income inequality in the United States has been higher than in Canada for the last four decades, with the main differences observed at the high end of the income distribution. These facts give rise to a number of important questions for future research, including the role (if any) of monetary policy in driving changes in income inequality and that of the monetary policy framework and decisions in reflecting the observed inequality.

Topics: Central bank research, Monetary and financial indicators, Labour markets
JEL codes: D31, D63, J31, J32, I24, I32, N32

Résumé

La montée des inégalités a suscité de nombreuses craintes dans les années qui ont suivi la crise financière mondiale de 2007-2009, et récemment encore, en raison de la pandémie de COVID-19. Dans le présent document d'analyse du personnel, nous examinons les faits tirés des données historiques concernant les inégalités de revenu au Canada, nous comparons l'évolution de ces inégalités avec ce qui s'observe aux États-Unis et faisons une revue sommaire des conclusions des travaux traitant des causes les plus plausibles de l'aggravation des inégalités. Les données montrent que les inégalités de revenus au Canada se sont accrues fortement dans les années 1980 et la première moitié des années 1990, mais qu'elles sont demeurées relativement stables au cours des 25 dernières années. Elles se sont surtout creusées au détriment des personnes à faible revenu et des jeunes, alors que les personnes âgées ont vu leur revenu de retraite s'accroître. Les inégalités de revenu ont été plus marquées aux États-Unis qu'au Canada au cours des quarante dernières années, et c'est dans la partie supérieure de la distribution des revenus que se trouvent les écarts les plus prononcés. Ces faits soulèvent d'importantes questions à approfondir dans des travaux futurs, dont celle de la capacité d'action éventuelle de la politique monétaire sur les inégalités de revenus et de leur prise en compte dans le cadre et les décisions de politique monétaire.

Sujets : Recherches menées par les banques centrales; Indicateurs monétaires et financiers; Marchés du travail
Codes JEL : D31, D63, J31, J32, I24, I32, N32

"Averages are no consolation to those who have been left behind."

- **Angus Deaton**

1. Introduction

The issue of inequality re-emerged as a central point of public policy discussions following the 2007–09 global financial crisis, and interest has intensified with the uneven economic impact of the COVID-19 pandemic across workers. The combination of the devasting destruction of livelihoods for many across the globe with the rising fortunes of a few has fuelled a more profound concern. This concern focuses on the adverse effects of inequality not only on the health and happiness of individuals but also on social cohesion and trust in the institutions that serve a country's citizens.

This staff discussion paper reviews and updates the historical facts regarding income inequality in Canada, comparing Canada with the United States and reviewing what research and data say about the most likely drivers of the rise in inequality. We also set out some ideas for future research that would be relevant to central banks.

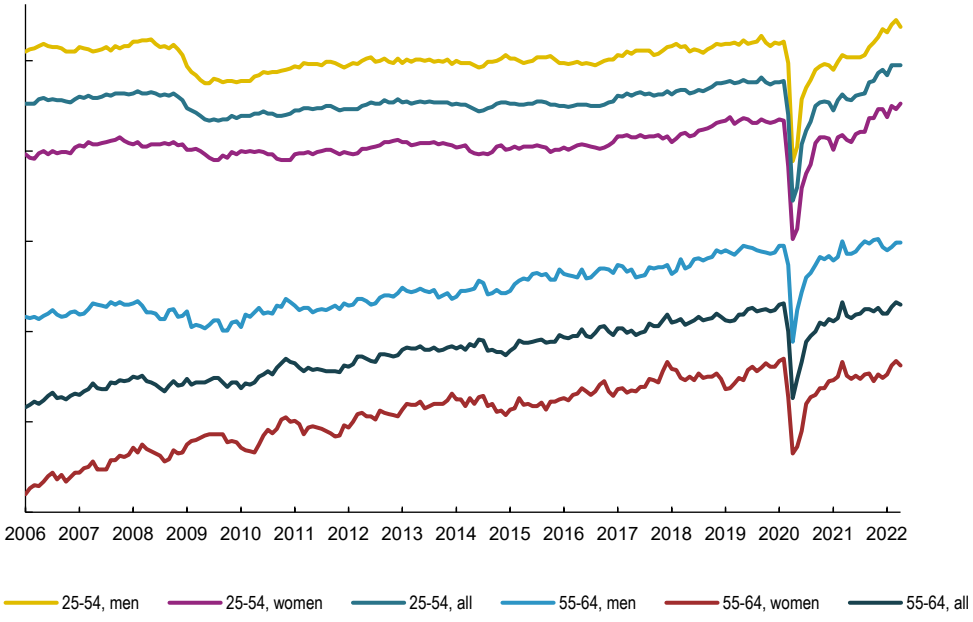
Increasing income inequality is important to central banks for several reasons. While the relationship between inequality and growth is complex, research has shown that economic growth and stability are adversely affected when inequality rises.[1] Moreover, monetary and financial sector policies can have distributional implications, even if they are not deployed to achieve distributional goals. For instance, Meh et al. (2010) find that under inflation targeting, relative to price-level targeting, savers who have high incomes and are old or middle-aged are hit harder by unexpected rises in prices through the redistribution of wealth. Furthermore, poor and old households demand more liquid assets per dollar of their consumption than other households. Since these assets receive little to no nominal interest, inflation erodes their value. As a result, these households experience the higher cost of unexpected inflation (Cao et al. 2021).

More recently, the uneven fallout from the COVID-19 pandemic has raised concerns that the most vulnerable are suffering more than others. In Canada, total employment had declined by over 3 million by April 2020, the peak of employment losses during the pandemic (**Chart 1**). While it took until October 2021 for the employment rate of the 25–54 age group to recover to its pre-pandemic peak, it took until March 2022 for that of the older age group to recover. And the employment rate of older women is still somewhat below its pre-pandemic level.

[1] Knack and Keefer (1997) and Keefer and Knack (2002) provide empirical evidence showing negative relationships between inequality and growth across developed and developing economies. Berg and Ostry (2017) discuss the implications of inequality in developing economies for the sustainability of growth.

Chart 1: Employment rate in Canada

By age and gender, 2006 to 2022, monthly data



Source: Statistics Canada, Table 14-10-0287-01

Last observation: April 2022

Clearly the large fiscal transfers that were put in place at the onset of the pandemic, in Canada and elsewhere, helped buffer the blow to personal incomes. The swift and considerable monetary policy actions undertaken by many central banks, including the Bank of Canada, supported these efforts to build a bridge to economic recovery. Even so, some commentators have raised concerns that monetary policy actions—from lower interest rates to large-scale asset purchases (e.g., quantitative easing)—may have supported the recovery but in a way that benefited the wealthy the most.

In this context, it is important to understand the facts and circumstances related to inequality in Canada. In section 2, we review market income (as well as other measures of income) by households and individuals over four decades.[2] The data presented in this paper provide a useful cross-sectional view of inequality, which shapes how people view their economic reality and economic dynamics at any point in time.[3]

The review yields five main stylized facts about how income inequality has evolved:

[2] One benefit of focusing on market income is that it excludes transfer income, which was not reported before 1989 and reported inconsistently before 1992. See Frenette, Green and Picot (2006).

[3] This view, however, does not provide insight into lifetime inequality or intergenerational linkages in income. The literature using large panel data on labour earnings has provided insights into the dynamics of lifetime or long-term earnings inequality. See, for example, Bowlus and Robin (2012); Guvenen et al. (2021); Lochner and Park (2022); and Bowlus et al. (2021). When applicable, this paper draws relevant results from the literature on lifetime inequality.

- **Income inequality in Canada increased substantially during the 1980s and first half of the 1990s but has been relatively stable over the past 25 years.** The largest and most persistent increases in the Gini coefficient (a measure of inequality in the underlying distribution, in this instance of household market income across the population) occurred during the recessions in the 1980s and 1990s. While many factors were at play over these periods, monetary policy actions to bring excessive inflation under control and to limit a further buildup of economic vulnerabilities partly played a role in these recessions.
- **The main contributor to these earlier periods of increased inequality is low-income earners.** This is consistent with members of this group being particularly hard hit by recessions and not recovering afterward, possibly because of hysteretic labour market effects. Meanwhile, the income of top earners recovered quickly after recessions and generally increased over the period.
- **Women still lag men in terms of income, with a larger share of women receiving income below the median.** Nonetheless, the share of women in the top 1% of income has increased sharply over the last four decades. This, together with increasing female labour market participation and their average income over time, has helped dampen the overall increase in inequality.
- **The increased inequality has fallen mainly on younger people.** Median incomes of those under 44 years old have either stagnated or fallen, while they have increased strongly for those 65 years or older. An increase in retirement income over the period explains this.
- **Government transfers to households and the progressive nature of the personal income tax system in Canada have significantly reduced the level of income inequality and mitigated its increase during recessions**. While data are not yet available, this is also likely to be the case in the context of government aid in response to the pandemic.

Wealth is also an important factor in understanding inequality across households. Unfortunately, time-series wealth data for Canada are limited. That said, we do know that **over the last decade, net worth has increased among all income quintiles, with households in the lowest three income quintiles seeing the biggest increases over the last five years**. The overall increase in net worth was in both the value of real estate holdings and financial assets. Aside from the recent pandemic measures, the relatively strong increase for the lowest-income group was likely due to a compositional effect—the share of people at retirement age in the lowest income quintile rose over the period. As income typically decreases with retirement, some of them move from a higher-income quintile to the lowest-income quintile. Since these newly retired households typically have a higher net worth than younger people in the same income quintile, the net worth of this quintile increases.

Section 3 compares Canada with the United States. Income inequality in the United States has been persistently higher than that in Canada for the last four decades. One of the main

differences is observed at the high end of the income distribution, that is, the share of income held by the top 10% (especially the top 1%) of the income distribution. This is partly driven by the importance of capital gains in the United States. That said, in both countries, the top 10% of the distribution holds a staggeringly large percentage of income—40% in Canada and 50% in the United States in 2018.

A brief review of the literature in section 4 reveals that the possible drivers of increased income inequality include:

- technological progress
- globalization
- growth in top executive pay
- immigration trends
- changes in family composition
- unincorporated self-employment
- policy and institutional changes

In contrast, increased labour force participation of women and higher-educated workers have helped to partially offset these increases.

Finally, the concluding section argues that these facts give rise to a rich set of research questions for central bankers and academics to tackle, including the distributional implications of monetary policy frameworks and actions.

2. The facts about income inequality in Canada

This section looks at trends in different measures of income and wealth inequality and aims to find the main sources of change by decomposing the data by wage and demographic groupings. We use various publicly available data from Statistics Canada, with sample lengths generally running from 1976 to 2019. All income measures are adjusted for inflation.

The biggest increases in inequality happened over 25 years ago

The most common measure of inequality is the Gini coefficient, which captures the distribution of income across the population. It is scaled to be between 0 and 1, with increases signalling that fewer people hold more of the share of total income in the economy. We present the Gini coefficient for Canada for three different household income measures—market income; total

income, including government transfers to households; and adjusted after-tax income—based on data from Statistics Canada's Canadian Income Survey (**Chart 2**).[4, 5, 6]

When market income is used, the Gini coefficient is more than 10% higher in 2019 than it was in 1976, even after its slight decline in the last few years of observations. This reflects mainly the fallout of the recessions in the 1980s and early 1990s. During these recessions, the Gini coefficient rose sharply and did not return to pre-recession levels but remained close to the new higher level even after the recession had passed. Since the late-1990s, it has remained largely stable at the high level.

The Gini coefficient is much lower when total income, which includes government transfers to households, is used in the calculations. The level of measured income inequality drops even further when after-tax income is used, reflecting the progressive nature of Canada's income tax system. Furthermore, Gini coefficients based on total income and after-tax income rise less sharply during recessions. This points to the contribution of automatic stabilizers and discretionary fiscal actions (note in **Chart 2** the sharp increase in transfers as a share of gross domestic product during recessions). It also reflects the use of tax policy to mitigate the business cycle's harm on lower-income families.[7]

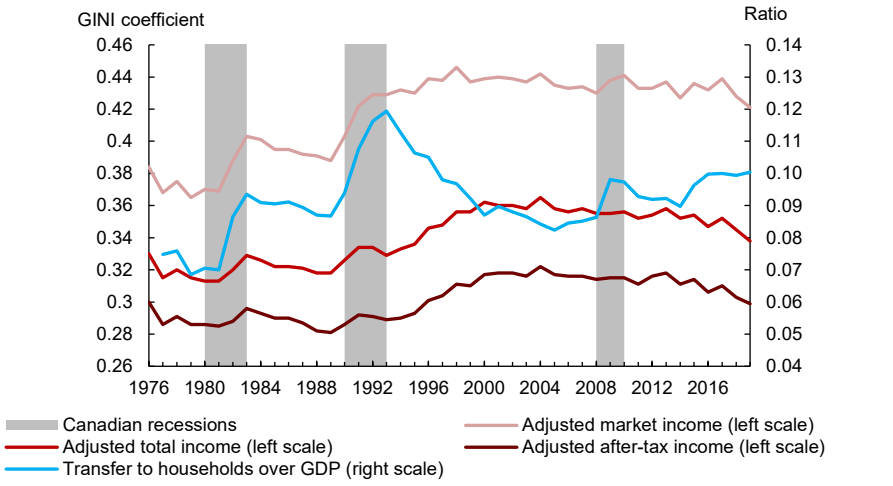
[4] From Statistics Canada, Table 11-10-0134-01, "Gini coefficients of adjusted market, total and after-tax income," which adjusts household incomes based on household size.

[5] Appendix A provides descriptions of data used, and Appendix B provides detailed definitions of the income measures.

[6] Bowlus et al. (2021) provide a summary of historical inequality in Canada based on an individual's average labour earnings over three years. Their analysis removes gender and lifecycle effects. Inequality measures based on these effects show similar patterns as those from raw cross-sectional earnings, suggesting that changes in the age composition of workers are not a driver of the observed earnings inequality patterns.

[7] This point is also stressed by Fortin et al. (2012).

Chart 2: Gini coefficient of income in Canada



Source: Statistics Canada, Table 36-10-0477-01 and Table 11-10-0134-01 Last observation: 2019

Falling real income of individuals in the lower percentiles explains the increase in inequality in the early 1990s

Drilling down on these developments, **Chart 3** shows the market income of individuals (instead of households) by percentile since the early 1980s.[8] The publicly available data from Statistics Canada's Longitudinal Administrative Databank focus on high-income groups, so unfortunately not much information is available on the lower tail of the income distribution. This dataset hints that part of the increase in the Gini coefficient in the 1980s may have been due to a rise in income of the top earners, although this increase starts only near the end of the recession. In contrast, the widening in the first half of the 1990s was driven by the drop in income of the 25th percentile of the distribution.[9] This loss has been persistent; the incomes of individuals in this percentile have not yet recovered in real terms. Bowlus et al. (2021) show that labour earnings of the low-income young in particular were hit adversely in the early-1990s recession. This observation is also consistent with that of the lifetime earnings in the United States where Guvenen et al. (2021) find that lifetime earnings of the median male worker declined for the cohort who started working in 1983 relative to those of the cohort who started in 1967. Stagnant middle-class income over the last several decades is a common observation among countries of the Organisation for Economic Cooperation and Development (OECD 2019).

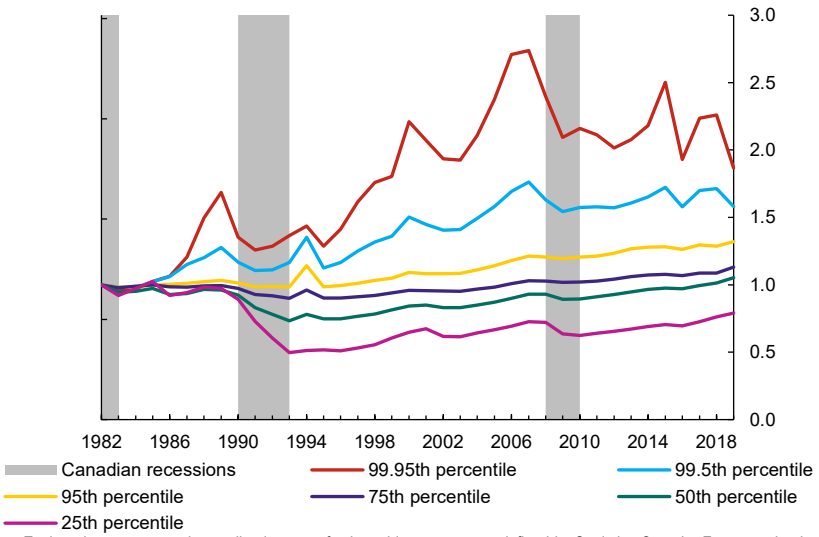
[8] For this chart and the rest of the document, data based on current dollar values have been adjusted to the 2019 constant dollar using the consumer price index from Statistics Canada, Table 18-10-0005-01.

[9] The blip in median income in 1994 is due to the elimination of the capital gains exemption. Tax filers realized their capital gains to take advantage of their unused portion of the $100,000 capital gains exemption.

Moreover, Zhang, Saani and Chung (2016) document that income mobility across income groups has also worsened, suggesting that inequality has become more persistent over time.

Chart 3: Median income level, 1982–2019, by income group

Market income including capital gains, adjusted for inflation, index: 1982 = 1



Note: Each series represents the median income of selected income groups defined by Statistics Canada. For example, the value for the 25th percentile is the median income of the bottom 50% income group.

Sources: Statistics Canada, Table 11-10-0055-01, and authors' calculations

Last observation: 2019

Since the mid-1990s, the income of the 99.95th percentile has grown dramatically more than that of the other groups. Interestingly, spikes in this and other higher-end income groups appear to precede the early 1990s recession and the 2008–09 global financial crisis. In the 1990s recession, while this group's income dropped, its recovery was much faster than that of other groups.

This raises the question of why the divergent growth in incomes across income percentiles over the last few decades does not show up in the Gini coefficients presented in the previous section. The Gini coefficients were stable (albeit at high levels) since the mid-1990s. This is because the Gini coefficient measure is relatively insensitive to changes at the extreme top and bottom of the income spectrum.[10]

Looking at dollar levels of income provides a more intuitive view of how much lower-income groups have fallen behind (**Table 1**). This is seen most clearly in the early 1990s. Lower incomes hit their lowest point in 1993, at the end of the recession. Earners in the 25th percentile lost just over 50% of their income. The higher-income groups were more sheltered over this

[10] See discussions of the Gini coefficient and other measures of inequality in Frenette, Green and Milligan (2007) and Osberg (2016).

period, with the 75th percentile losing only 10% and the 99.95th percentile actually gaining. While real incomes rebounded strongly between 1993 and 2019 (those for the 99.95th percentile were 87% above their 1982 level), incomes for the 25th percentile were still down by 21%.

The severity of the income loss borne by the 25th percentile can be put into perspective by comparing it with the low-income cut-off. Statistics Canada defines this cut-off as the before-tax income threshold below which a family will likely devote a larger share of its income on the necessities of food, shelter and clothing than the average family will, i.e., a poverty line. Given that the low-income cut-off is defined based on before-tax income, i.e., total income, direct comparison of its level with that of market income is difficult. However, the relative changes of both measures over time are still informative. This poverty line has been steadily increasing, while income at the 25th percentile has decreased. The poverty line was below the 25th percentile of income in 1982, but it is now around triple that of the 25th percentile, meaning a larger percentage of earners in the 25th percentile are failing to make ends meet.[11]

Table 1: Individual market income for select years

Year	Low-income cut-off line*	Percentile				
		25th	50th	75th	95th	99.95th
				Level in 2019 dollars		
1982	12,417	13,476	40,091	76,140	138,803	880,023
1993	19,361	6,698	29,386	68,495	136,775	1,201,808
2019	30,760	10,660	42,206	86,142	183,231	1,643,321
				Cumulative change (%)		
1982–1993	55.9	-50.3	-26.7	-10.0	-1.5	36.5
1993–2019	58.9	59.1	43.6	25.8	34.0	36.7
1982–2019	147.7	-20.9	5.3	13.1	32.0	86.7

*The low-income cut-off line is total income before tax for a one-person household in a mid-size city with a population of 30,000 to 99,999.
Source: Statistics Canada Table 11-10-0055-01 and Table 11-10-0241-01

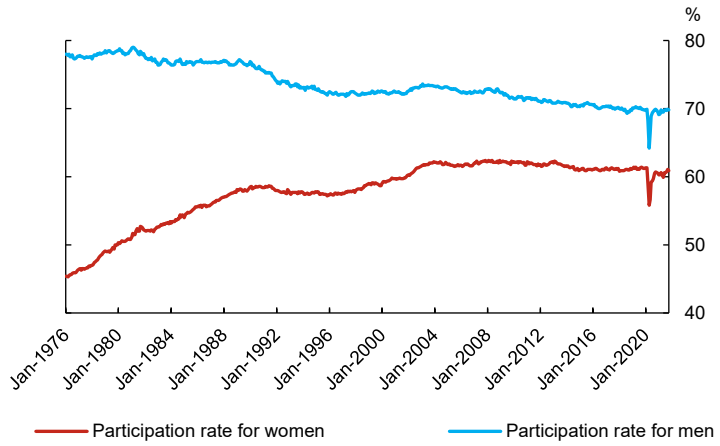
[11] Since the percentiles of income are based on an individual's income and this individual might be a member of a multi-person household, the percentiles are not directly comparable with the low-income cut-off measures for a one-person household. However, the relative changes of these two income measures over time would still be informative.

Labour force participation of women still lags that of men despite improved incomes

Labour force participation of women increased steadily until the middle of the 2000s as male participation trended down (**Chart 4**). Nevertheless, the participation of women was still lower than that of men. Women have also experienced lower wages and fewer hours worked (**Chart 5**).

Chart 4: Labour force participation rate for women and men

15 years and older, 1976–2021, monthly data

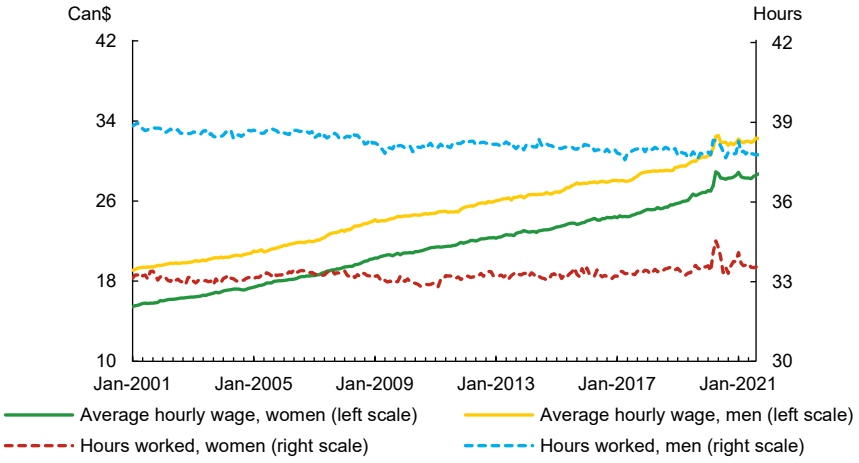


Source: Statistics Canada, Table 14-10-0287-01

Last observation: October 2021

Chart 5: Average hours worked and average hourly wage

By gender, January 2001–September 2021, monthly data



Source: Statistics Canada, Table 14-10-0320-01

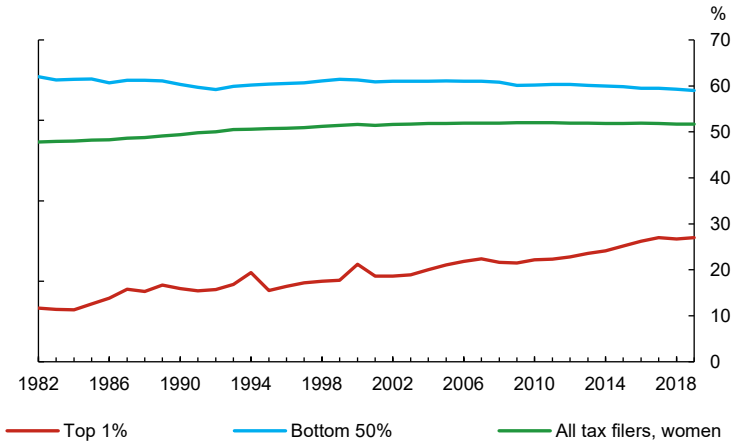
Last observation: September 2021

Income data shed further light on income differences between genders. Around 60% of tax filers in the bottom 50% income group are women. This has not changed much since 1982

(**Chart 6**). However, the share of women in the top 1% of income earners has more than doubled over this period. That said, at 27% in 2019, women represent a much smaller share than men.

Chart 6: Percentage of female tax filers by income group

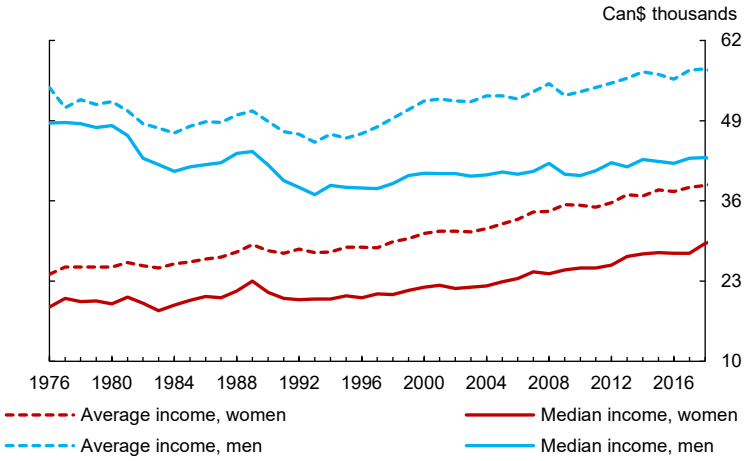
Market income including capital gains



Source: Statistics Canada, Table 11-10-0055-01 Last observation: 2019

Findings from a different survey show that income inequality within each gender grouping has evolved differently. In particular, for women, both average and median incomes have increased since 1976 (**Chart 7**). In contrast, average income for men has edged up, while their median income has decreased.

Chart 7: Market income for men and women, 16 years and over



Source: Statistics Canada, Table 11-10-0239-01 Last observation: 2019

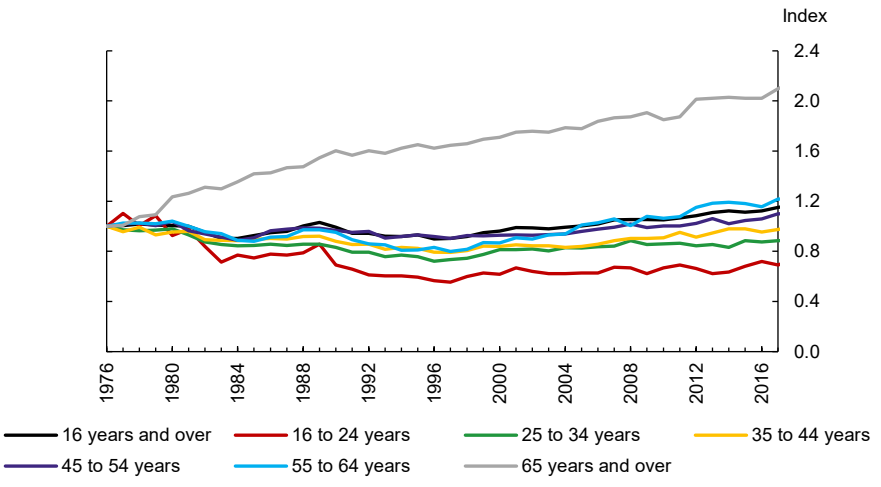
These data show that, overall, women are catching up to men in the labour market. However, this increase appears to have been enjoyed primarily by highly educated women (Fortin et al. 2012). The growth of women's income in the top percentiles has dampened the increase in income inequality we would have otherwise witnessed over the last few decades. In fact, a decomposition analysis reveals that the increase in female employment during the 1987–2004 period had reduced the increase in household earnings inequality, while the increase in the dispersion of male earnings was the main driving force pushing up the inequality over the period (OECD 2011).

Median incomes of those under 44 years old have either stagnated or fallen

The most striking observation when looking at trends in median total income by age group is the divergence between those 65 and over and everyone else. The growth in income of the 65 and over age group has far outpaced that of other groups (**Chart 8**). Younger groups experienced either flat or declining incomes in the 1980s and first half of the 1990s, the same period over which income inequality increased. The real incomes of those in the 16 to 24 age group and, to a lesser extent, those aged 25 to 34 are now lower than in 1976. Slower growth in income in the younger groups could be due to more young people choosing to further their education, delaying their start in the labour market (Galameau, Morissette and Usalcas 2013).[12] As discussed in section 4, higher educational attainment is an offsetting force to inequality.

Chart 8: Median total income, both genders

Index: 1976 = 1



Source: Statistics Canada, Table 11-10-0239-01 Last observation: 2019

[12] The persistence of earnings between parents and their children is also important in understanding the persistence of overall income inequality. Lochner and Park (2022) find that the intergenerational transmission of skills (or the persistent component of one's earnings) is important, especially over the early part of a child's career.

The increase in income for the 65 and over age group was from a much lower starting point than for the other groups, even the youngest group (**Table 2**). Over the past 40 years, the median income of the older group has grown from less than a half of the median income of all earners to 80%.

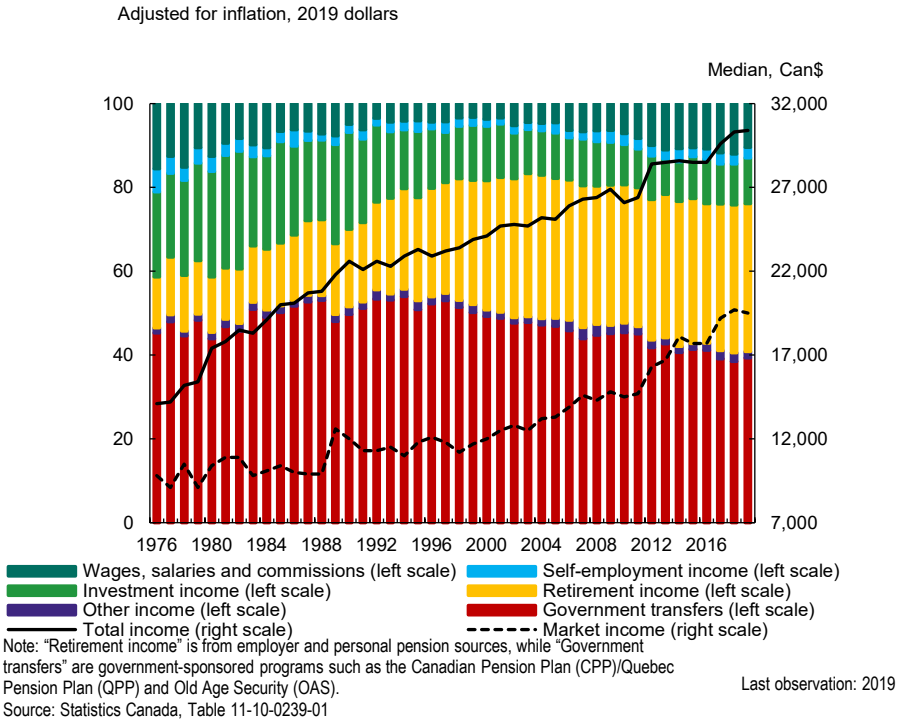
Table 2: Median total income by age, both sexes, adjusted for inflation at 2019 dollars

Year	All earners	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
1976	31,700	17,500	45,200	51,400	46,600	35,400	14,100
2019	37,800	12,600	41,700	51,500	54,200	42,800	30,400

Source: Statistics Canada, Table 11-10-0239-01

While government transfers have made up the largest share of the total income of seniors, the increase has been largely driven by private retirement income from employer and personal pension sources (**Chart 9**).

Chart 9: Income sources, 65 years and over



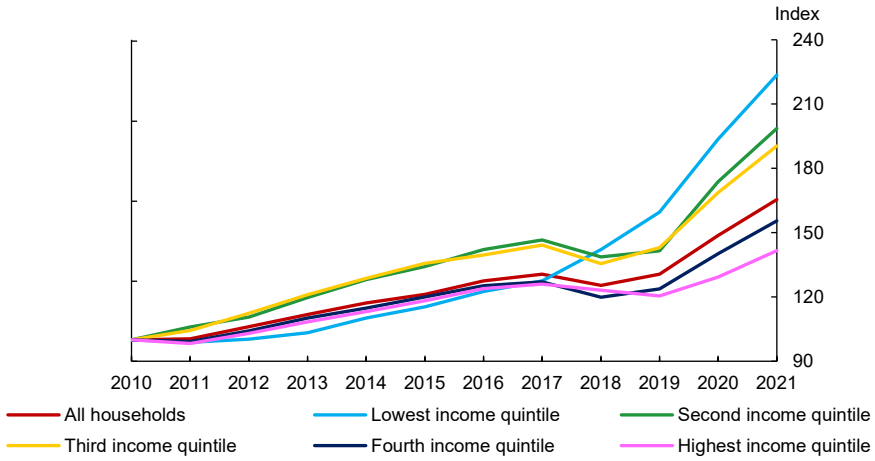
The wealth of low-income households grew more than that of other groups

While wealth is an important part of inequality, publicly available time-series data on wealth in Canada are regrettably limited in terms of granularity. In this paper, we use the Distributions of Household Economic Accounts, which have data only from 2010 to 2021. Breaking down

wealth by income quintile, we can see that all income quintiles have seen increases over the last 10 years. Since 2017, the rate of growth has been the strongest in the lowest three income quintiles (**Chart 10**).

Chart 10: Net worth (wealth) per household

Index: 2010 = 100



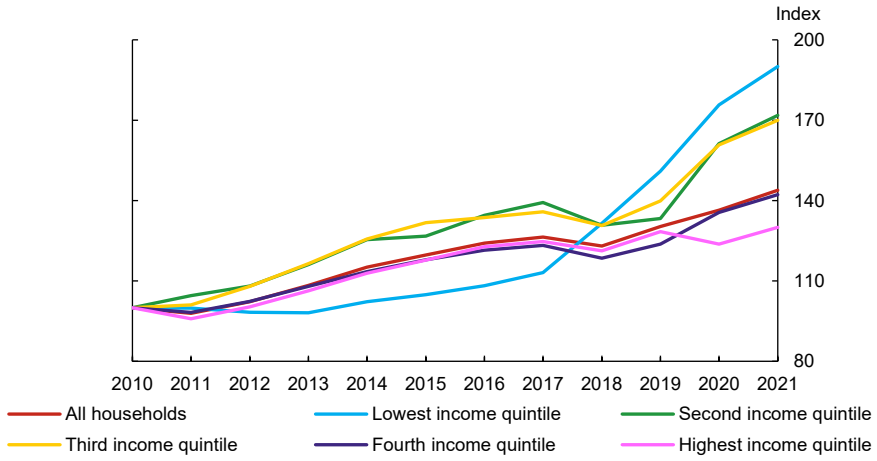
Source: Statistics Canada, Table 36-10-0660-01

Last observation: 2021

If we look at the growth of different components of wealth, we see that both financial assets and real estate have driven the increase in wealth for all income quintiles, with each being roughly equally important drivers for the three lower-income groups (**Chart 11** and **Chart 12**). Households in the lowest income quintile saw the largest increase in financial assets since 2017. Various government support programs targeted to low-income households during the pandemic period undoubtedly explain some of this in more recent years. That said, compositional changes were also important. In particular, an increase in the share of the retirement-age population in the lowest income quintile is a contributing factor to the relatively strong increase in net worth of this group (**Chart 13**). That's because, while income typically goes down with retirement, moving some older households to the lowest income quintile, many of these households hold financial assets and therefore have higher net worth than younger people in the same income quintile.

Chart 11: Growth in financial assets, value per household

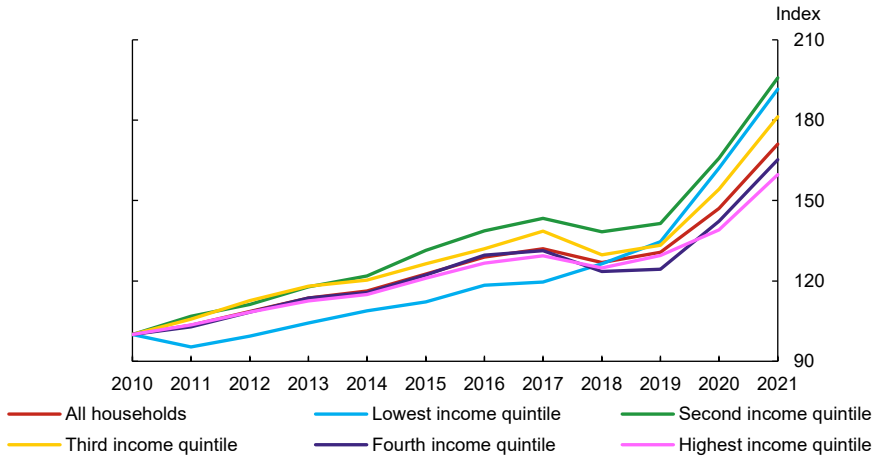
Index: 2010 = 100



Source: Statistics Canada, Table 36-10-0660-01 Last observation: 2021

Chart 12: Growth in real estate, value per household

Index: 2010 = 100

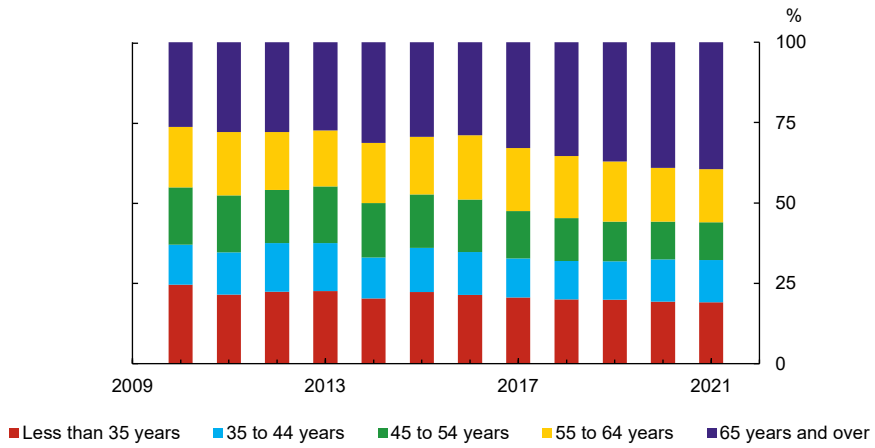


Source: Statistics Canada, Table 36-10-0660-01 Last observation: 2021

The composition of net worth also differs across each income group (**Chart 14**). Real estate and financial assets are the two largest categories of assets. Real estate is the most important asset for people in the lowest income quintile, while financial assets are the most important for those in the highest quintile.

Chart 13: Lowest quintile composition by age

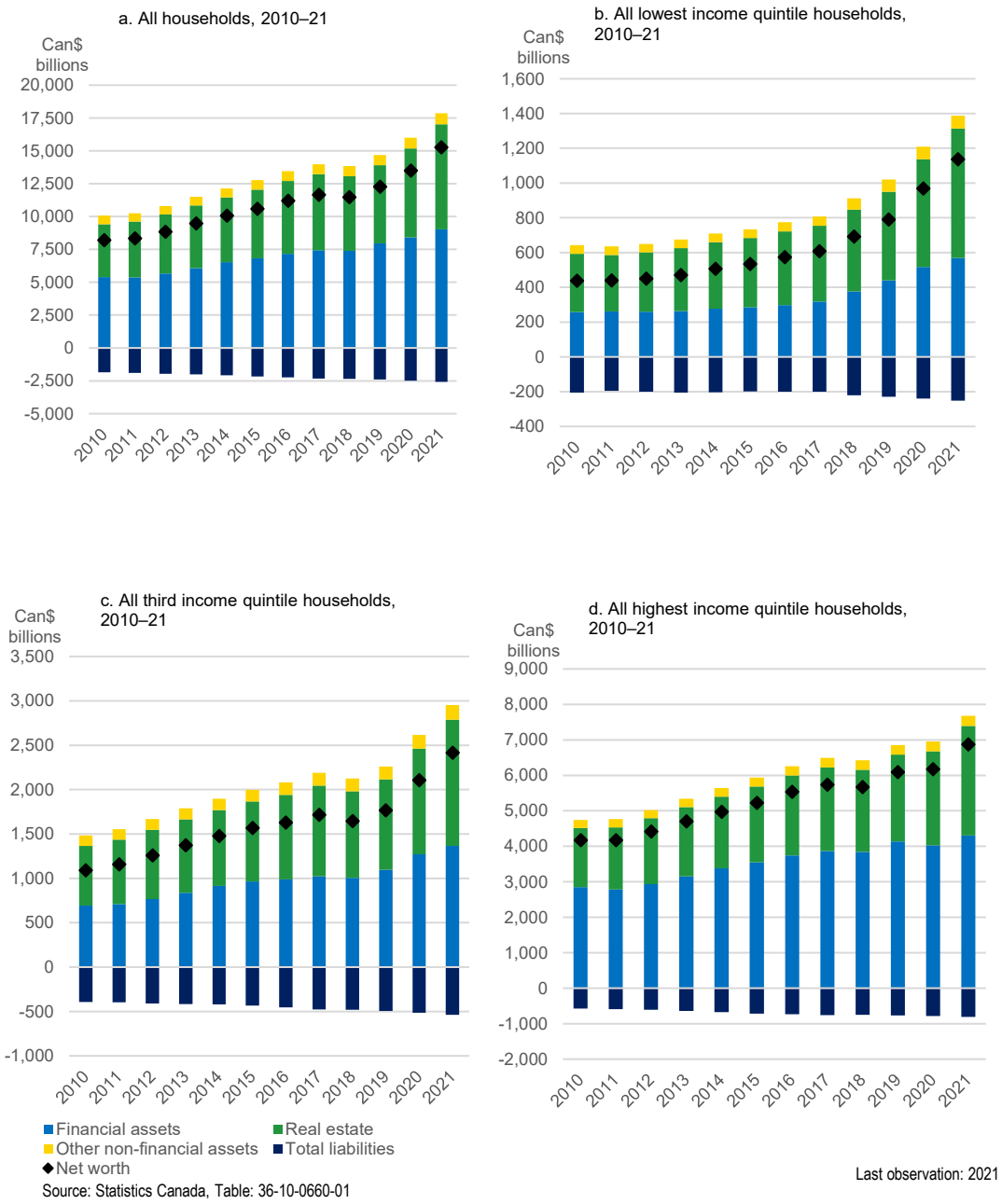
By number of households



Source: Statistics Canada, Table 36-10-0101-01, and Bank of Canada calculations

Last observation: 2021

Chart 14: Net worth, assets and liabilities



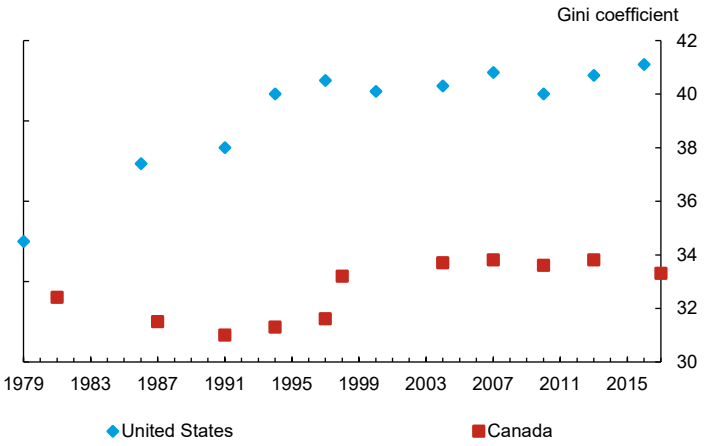
Source: Statistics Canada, Table: 36-10-0660-01

Last observation: 2021

3. Canada compared with the United States

In this section, we compare income inequality in Canada with that in the United States using Gini coefficients calculated by the World Bank.[13] The Gini coefficients for the two countries were relatively close together at the start of the sample in the late-1970s, but since then the gap between the two series has opened up (**Chart 15**). For the United States, most of the increases occurred from the early 1980s to the mid-1990s, a period over which US policy-makers were also battling inflation.[14] For the two decades after that, this measure of income inequality for the United States changes little, similar to the Canadian experience over that period.

Chart 15: Gini coefficients for United States and Canada



Source: World Bank, occasional household survey data

Last observation: 2017

For the next few charts, we use data from Piketty and Saez (2003) for US data, updated in 2018, and from Statistics Canada's Longitudinal Administrative Databank for Canadian data. **Chart 16** shows the income shares for the top 10% income percentile. In both countries, the top 10% hold a staggeringly large percentage of income (including capital gains)—40% in Canada and 50% in the United States by 2018. Excluding capital gains, both countries see a small drop in

[13] These Gini coefficients are not computed on a yearly basis and differ slightly from the Statistics Canada data presented in Chart 4, although the general trend is similar. Statistics Canada uses adjusted household income in its calculations, whereas the World Bank uses unadjusted total household income, which includes government transfers. However, in-kind transfers, such as food stamps in the United States, are not captured, likely biasing the US Gini coefficient upward.

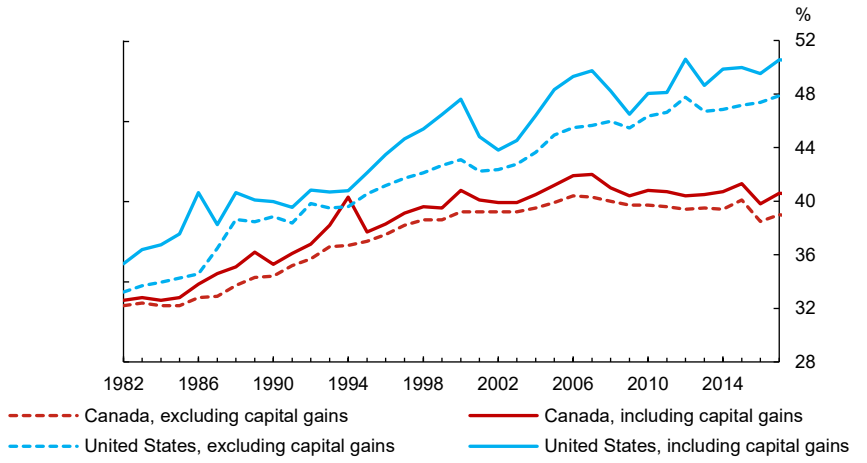
[14] Income data for the United States are based on the US Census Bureau's Current Population Survey. The survey introduced some changes in 1993, including an increase in the top coding for earnings from longest job or business from $299,999 to $999,999. These changes can artificially increase an inequality measure like the Gini coefficient. However, the change in the top coding is estimated to result in an increase of the household income Gini coefficient by only 0.007 (Ryscavage 1995).

the income shares, although the drop is larger for the United States, implying the higher importance of capital gains for top US wealth holders than for their Canadian counterparts.

Looking at the dynamics of the series, the top 10% gained a much greater income share in the United States than in Canada over the 36 years of the sample. The share of the US top 10% increased by about 15 percentage points, while Canada's increased by 8 percentage points (including capital gains).

Chart 16: Canadian and US top 10% income share

Market income



Sources: Statistics Canada, Table 11-10-0055-01, and Piketty and Saez (2003) with 2018 updates

Last observation: 2018

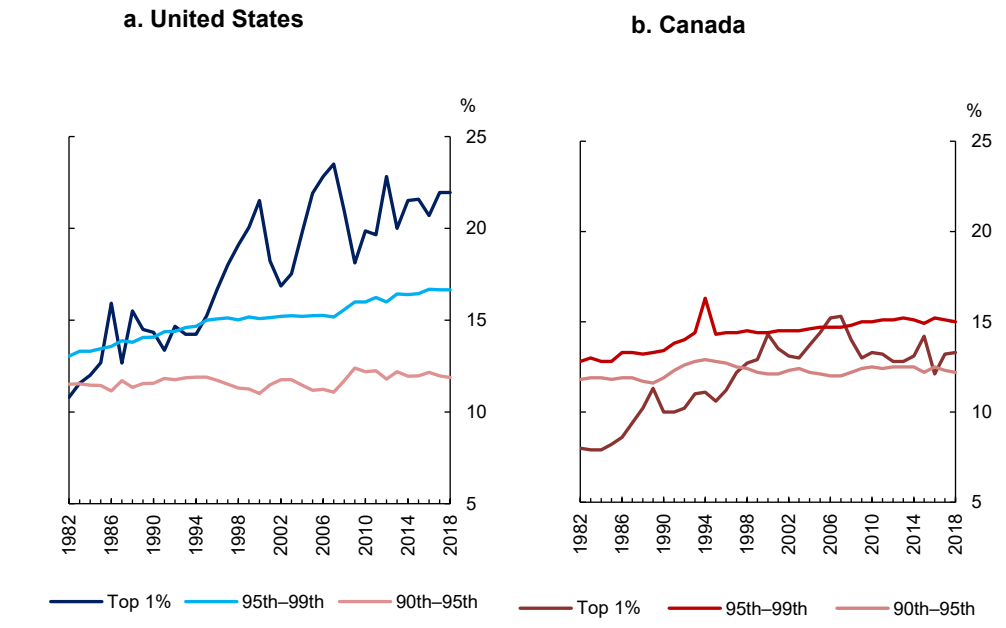
We decompose the top 10% income share into subgroups: above the 99th percentile, between the 95th and 99th percentiles, and between the 90th and 95th percentiles (**Chart 17**). Interestingly, the income shares of the 95th–99th percentiles and the 90th–95th percentiles are similar in both countries. This decomposition allows us to see that the top 1% drives most of the difference in the two countries. The income share of Canada's top 1% is lower or around the same level as the other two groups. In the United States, the share of the top 1% increases dramatically in 1995 and remains about 5 percentage points higher than that of the 95th–99th percentile group.[15] It's also much more volatile, dropping significantly during recessions. Canada's top 1% is also slightly more volatile than the other components of the top 10%, but to a lesser extent.

A divergence in the relative prices for human capital between Canada and the United States may have contributed to the higher path for the US Gini coefficient during the 1980s and 1990s. Analysis of labour earnings decomposed by education, efficiency units supplied and hours worked for the two countries indicates that the price of human capital for university

[15] The Canadian–US comparison within the top 1% income group shows that the gap between the two countries exists for the top 0.1% and 0.01% income groups (Veall 2012; Saez and Veall 2007).

graduates declined for both countries, but more severely for Canada. Also, this price of human capital for high school dropouts declined more in the United States (Bowlus, Robin and Liu 2019). These findings help explain the larger increase in US Gini coefficient relative to that in Canada during the period because high-income educated workers received higher wages and low-income uneducated workers received lower wages in the United States relative to their peers in Canada.

Chart 17: **Decomposition of the top 10% income share**
Market income, including capital gains



Source: Piketty and Saez (2006) updated in 2018 and Statistics Canada Table 11-10-0055-01

Last observation: 2018

4. Drivers of increasing income inequality

The literature identifies numerous drivers of the observed changes in income inequality globally and in Canada, although it is difficult to determine the exact contribution of each since many of these drivers likely interact with one another.

Technological progress is a common factor that has been associated with increased wage inequality in many developed countries (OECD 2011; Wilkins 2018).[16] That is because technological change can make some workers obsolete while augmenting the productivity of others. This drives a wedge between compensation for jobs that benefit from this change and

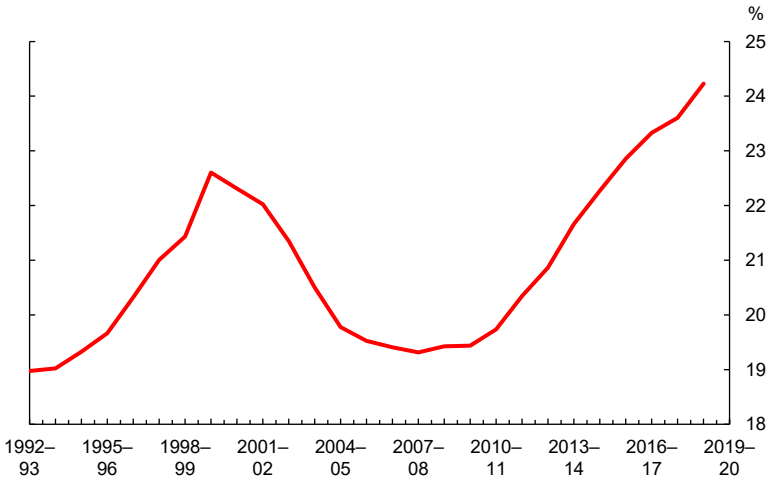
[16] It is important to note that technological progress is a main driver for economic growth. The literature has many works analyzing this. See, for example, Lucas (1988); Romer (1990); Barro (1991); and Sala-i-Martin (1997). This paper highlights another channel through which technological progress can affect the economy, namely its impact on inequality.

those that do not. The literature finds that skills-biased technological changes that complement the use of capital and high-skilled and highly educated workers contribute to the observed increase in the skill premium in the United States (Krusell et al. 2000).

Consistent with these findings, Canadians in the top income group who have science degrees, including computer science, have made substantial income gains within that group (Lemieux and Riddell 2015). Recent data show that the percentage of post-secondary school enrolments in scientific fields increased during the 1990s, declined in the 2000s and has been on an increasing trend since then (**Chart 18**). The impact of the latest trend on income inequality has not been clear in the data, given the relatively stable Gini coefficient for market income over the last two decades (**Chart 2**).

In addition, this technology-driven increase in the skill premium can cause employment polarization, leading to the hollowing out of the middle class in terms of jobs and wages. In Canada, employment and wage patterns consistent with polarization have been observed since 2005; however, the resource boom may have contributed more to this than technological change on its own (Green and Sand 2015).

Chart 18: Percentage of post-secondary enrolments in scientific fields, 1992–2020



Source: Statistics Canada, Table 37-10-0018-01

Last observation: 2020

Increased globalization over the last few decades is another common factor, driven by technological advances, along with an increase in bilateral and multilateral trade agreements (e.g., the Canada-United States Free Trade Agreement in 1989 and the North American Free Trade Agreement in 1994). A wealth of evidence shows that, while globalization has helped lift many out of poverty worldwide, it has had undesirable distributional consequences in income between industries, firms and workers in some countries. For example, the literature finds evidence that trade liberalization led to increased wage inequality between workers at firms

that participate in trade and those at firms that don't participate in trade (Helpman, Muendler and Redding 2017).

In addition, the decline in manufacturing in Canada that we've seen since the early 2000s has taken a disproportionate toll on the employment and wages of men, especially those who have less formal education (Morissette 2020). Both technological progress and globalization contributed to this decline in manufacturing (Mowat Centre 2014). A loss of competitiveness through the appreciation of the Canadian dollar leading to higher labour costs has also been cited as a contributing factor (Macklem 2013).

Growth in top executives' pay has contributed to the increasing inequality by stretching the top end of the income distribution. The literature provides two different arguments for what is driving this growth. On one hand, studies suggest that increased competition for highly skilled chief executive officers (CEOs) together with the increase in the market value of firms can explain the observed growth in CEO pay in the United States since 1980s (Gabaix and Landier 2008; Gabaix, Landier and Sauvagnat 2014; Saez and Veall 2007). On the other hand, the literature argues that this growth is driven by rent-seeking behaviour by corporate executives and not the result of well-functioning competitive markets for talent in the United States and in Canada (Bivens and Mishel 2013; Lemieux and Riddell 2015).

Increases in education, given the importance of technology, have not surprisingly dampened increases in income inequality (OECD 2011). Growth in educational attainment has sizably offset the various forces that have been increasing earnings inequality. Upskilling, which involves workers learning new skills and improving their current ones, has been the main force in reducing wage differences among employees as well as in increasing employment between the mid-1980s and mid-2000s. In addition, the overall increase in the supply of higher-educated workers offsets the increase in inequality associated with technological progress. Hence, the counteracting dynamics of income inequality can be considered the result of the race between education and technology (Tinbergen 1975).[17]

Education can also have different implications for the cross-sectional inequality measures used in this paper and those based on lifetime income. The share of population with a university-equivalent degree has been increasing over time.[18] This suggests that increasingly more younger people have been attending universities and receiving little or no income during their studies in expectation of higher incomes in the future. Current cross-sectional inequality measures would reflect this as increasing inequality, while the measures based on lifetime income would not.

[17] Returns to education have fallen over the past 20 years (Galassi, Kyui and Park 2020). This is likely because the number of educated people in Canada has grown. However, Boudarbat, Lemieux and Riddell (2010) argue that controlling for experience makes a large difference in the wage premium.

[18] See Statistics Canada Table 37-10-0130-01: Educational attainment of the population aged 25 to 64, by age group and sex, Organisation for Economic Co-operation and Development (OECD), Canada, provinces and territories.

That said, some argue that, in Canada, human capital policy may have had only limited effects on income inequality. That's because changes in earnings differentials related to education have not played an important role in increasing inequality, as most of the rise in earnings inequality occurred within education groups, not between them (Foley and Green 2015). Moreover, high-income families are more likely to take advantage of a program like registered education savings plans than low-income families are, making members of high-income families more likely to pursue a higher education than their low-income peers. Finally, as the number of educated workers increase, it's possible that firms choose more production technology fit for highly educated workers, leaving the less-educated with reduced access to good jobs and thus lower wages (Beaudry and Green 2003).

Immigration trends have had implications for income inequality, and these have changed over time**.** During the 1990s, increases in the number of immigrants with low incomes were the main driver behind the *increase* in the national low-income rate (Picot and Hou 2003). During the 2000s, however, the change in the immigrant selection policy toward the highly educated helped *reduce* the low-income rate among immigrants (Hou and Picot 2016). Technological progress coincided with this change in immigration policy, requiring more immigrants with higher levels of education. Although the low-income rates among immigrants declined, the impact on the overall earnings inequality in Canada was small (Warman and Worswick 2015).

Changes in family composition and vulnerable minorities have also influenced inequality. Between 1987 and 2004, the share of single-headed households (single individuals and lone-parent families) in Canada increased from 20% to 25% (OECD 2011). This increase contributed to the increase in household income inequality (Lu, Morissette and Schirle 2011). In addition, vulnerable groups such as Indigenous people, recent immigrants, youths not in school, persons with a disability and unattached older individuals are more likely to be poor as well as have a less formal education and poorer health (Fang and Gunderson 2019). These groups are also more sensitive to economic cycles than their non-vulnerable peers. At the same time, the labour force participation of women had been increasing over the period (**Chart 6**). This shift in the female participation rate exerted an equalizing effect on income inequality between genders (Goldin 2006), although women still earn less than men (**Chart 9**).

The increase in unincorporated self-employment has also been associated with higher income inequality in Canada (OECD 2011). Self-employment rates rose between the 1970s and late 1990s, driven by the increase in self-employed businesses that are unincorporated, without paid help and run by older men and women or prime-age women (Kamhi and Leung 2005). Those self-employed as unincorporated businesses make less money and face higher risk than those self-employed as incorporated businesses and paid employees (LaRochelle-Côté and Uppal 2011). During the global financial crisis, the number of employed workers fell by 2.1% between October 2008 and October 2009 while that of self-employed businesses increased by 4.3% (LaRochelle-Côté 2010). This suggests that some who lost their job during the crisis may have turned to self-employment. The recent literature also stresses the importance of the

overall conditions when businesses start up for their future success (Sedláček and Sterk 2017). When a business is established during a recession, its growth is persistently slower than that of those starting in non-recession periods.

Finally, various **policy and institutional changes** have also affected income inequality. As seen in **Chart 5**, the 1990s recession is associated with a large and persistent increase in inequality. As possible drivers of these dynamics, we look at what led to or deepened the 1990s recession and their implications for inequality:

- The Bank of Canada and the Department of Finance announced the inflation-targeting monetary policy framework in 1991 in response to high and persistent inflation observed during the 1970s and 1980s. Some argue that monetary policy overshot to bring inflation down and thereby caused or deepened the recession (Wilson, Dungan and Murphy 1994). This could have generated structural unemployment with scarring effects, pushing up inequality.
- Fiscal policies were consolidated during the period (Wilson, Dungan and Murphy 1994; Thiessen 2001; Fortin et al. 2012). These consolidations—possibly impacting after-tax income inequality—include federal tax increases, such as for sales, excise and payroll taxes, in reaction to the accumulation of public sector debt as well as provincial tax and transfer systems that became less focused on equality.
- Weaker employment protections (in particular for temporary contracts) may have widened the wage distribution among employed people (OECD 2011).
- Minimum wage and labour unionization can have large impacts on wage inequality (Card and DiNardo 2002). In Canada, increases in the minimum wage relative to the average wage in the 1990s helped women and young workers, thereby reducing what otherwise would have been even higher inequality (Fortin et al. 2012). Labour unions can also help sustain wage rates at the lower end of the distribution. The rate of unionization in Canada has continuously declined since the 1980s, possibly contributing to the observed increase in income inequality.[19]

5. Avenues for further research for central banks

Over the past few decades, central bankers have been paying increasing attention to inequality (Carstens 2021). Despite this growing attention, central banks continue to base the main analysis on aggregate data—such as gross domestic product, inflation, unemployment and sectoral totals—using their workhorse economic models (see Corrigan et al. 2021; Brayton and Tinsley 1996). This analysis is often supplemented with a more detailed assessment of different groups in the economy. However, formal models do not fully account for heterogeneity in the financial conditions and behaviours of different agents in the economy (e.g., households, non-

[19] See Statistics Canada, "Unionization rates are falling" (May 17, 2018).

financial firms and financial firms).[20] This is not out of neglect; rather it is because views diverge on whether heterogeneity in general, and income inequality in particular, matters for the aggregate effects of monetary policy. In this regard, the facts and discussions from the literature presented in this paper serve as relevant background information and shine light on some avenues for further research.

Transmission channels of monetary policy rate actions to the economy when agents are heterogeneous

The literature has made progress on identifying the main transmission channels of monetary policy when heterogeneous households and firms are considered (Kaplan, Moll and Violante 2018; Alves et al. 2022). Some of these channels reveal aggregate implications of monetary policy that are different from those when only a representative agent is considered. For example, the countercyclical nature of idiosyncratic income risk, such as unemployment risk, might interact with precautionary savings motives. This can generate a downward spiral in output through a reduction in demand and the related response in supply (Ravn and Sterk 2020; Gornemann, Kuester and Nakajima 2016). This channel suggests that monetary policy should be more accommodating during recessions to break this spiral. The rise in the Gini coefficient in Canada in the 1980s and early 1990s, when monetary policy was acting to bring inflation down, underscores the importance of studying the economic importance of this channel and the relationship between monetary policy actions and income inequality, if any. Recent work has suggested that certain transmission channels impact the extreme ends of the distribution the most. In particular, the general equilibrium effects of expansionary monetary policy acts through the labour-income channel to reduce unemployment and increases earnings for the lowest-income groups. However, the reduction in inequality is dampened by the direct effects of asset inflation through the capital-income channel, which adds income to the highest-earning groups (Coibion et al. 2017; Kaplan, Moll and Violante 2018; Amberg et al. 2021; Anderson et al. 2021). The relative strengths of these effects differ by country and time horizon. As such, aggregate inequality measures like the Gini coefficient may not reflect a comprehensive picture of the distributional effects of monetary policy.

Implications of unconventional monetary policies for the distribution of income and wealth

Since the global financial crisis and, especially, during the COVID-19 pandemic, many central banks have implemented unconventional monetary policies, e.g., quantitative easing (QE), forward guidance and negative interest rates. There is an emerging consensus that these policies can effectively lower interest rates across the yield curve; however, debates have arisen

[20] Although there has been a lot of progress within the past decade, the body of literature on monetary policy and heterogeneous agents is still at an early stage.

as to how they impact the incomes and wealth of the rich and the poor (Bank for International Settlements 2019). Assessing how these policies affect households with different portfolios of income, assets and debt is an important issue for central bankers. It is also complex, particularly given the need to look at the impact of both the introduction and the withdrawal of these policies on a full range of asset prices, including housing. It is also essential to assess what might have happened without these policies. We know from our brief look at wealth data that housing has been a particularly important source of wealth for middle- and even some lower-income households, but that affordability issues have also increased.

The macroeconomic literature on quantifying the impact of extraordinary monetary policy on inequality and heterogeneity is growing, but more work is needed to guide policy-makers. The literature so far has produced mixed results that depend on the relative importance of the two main channels: the labour market channel where the policy increases employment and wages at the bottom part of the income distribution and the financial market channel where it raises the returns on assets benefiting the middle to top parts of the distribution. Unconventional monetary policy in Japan has been found to have increased income inequality because the country's labour market rigidity reduces the benefit of the labour market channel (e.g., Saiki and Frost 2020). In contrast, Lenza and Slacalek (2018) find the policy in the euro area reduced income inequality through increased employment among low-income households. Studies based on general equilibrium models calibrated to US data also find conflicting results. On one hand, QE has been found to induce higher income inequality, even after an initial reduction in the inequality, because it leads to dispersion in asset holdings and labour supply (Cui and Sterk 2021). On the other hand, a study based on a heterogeneous agent New Keynesian model finds that QE reduced overall income and wealth inequality even though the shares of income and wealth in the top 10% households increased (Lee 2021).

Implications of different monetary policy frameworks for the distribution of income and wealth

We know that different monetary policy frameworks can have diverse distributional implications for the economy. For example, Meh et al. (2010) find inflation-targeting and price-level-targeting frameworks lead to different price-level paths after a transitory inflation shock. Future price levels are permanently higher under inflation targeting—due to its feature of letting the bygones be bygones—than those under price-level targeting, which takes into account past price levels. This difference generates a redistribution of wealth between nominal savers and borrowers that is larger under inflation targeting than it is under price-level targeting. This in turn leads to macroeconomic impacts in consumption and welfare that are also larger under inflation targeting. Similarly, monetary policy under a dual mandate (i.e., price stability and labour market stability) will have general equilibrium implications for different types of households and workers (Bank of Canada 2021). We know from the data presented earlier that growth in income has been uneven for different groups over the past few decades,

for instance, according to age and gender. An avenue for further research would be exploring the extent to which the inflation-targeting framework benefited these different groups, and whether other monetary policy frameworks would do better or worse. If the data were available, it would be important to add other elements of heterogeneity, including groupings based on race.

Distributional implications of macroprudential policies

Two types of macroprudential policies have been implemented across countries to mitigate the risk of the type of economic stress that hits hardest those who can afford it the least:

- Policies to contain potential boom-bust cycles in the housing market (e.g., limits on the ratio of mortgage loan to house value and those on loan-to-income or debt-service ratios). These have direct implications for households that would like to purchase a home, including first-time homebuyers, as well as for those selling a house. This is because these policies affect house prices as well as access to mortgage financing and the opportunity to earn capital gains (or suffer losses). Given that middle-income groups currently have a larger portion of their net worth in housing, and the fact that younger people and lower-income earners are more likely to be constrained by these policies, this question is particularly relevant.
- Policies to reduce systemic risk in the banking sector that can build up over a credit cycle (e.g., countercyclical capital buffers). These have indirect implications for households and businesses through the pricing of credit and deposit products.[21] This may be particularly important for low-income earners and smaller businesses, who are more likely than high-income earners and large corporations to be credit-constrained.

As with the previous research avenues, any empirical analysis would need to consider the benefits of economic and financial stability. At the same time, a clearer and more precise understanding of who gains and who loses would provide important information for macroprudential policy design as well as potential policy coordination with monetary and fiscal authorities.

[21] See Peydró et al. (2020).

Appendix

A: Description of the data used

Longitudinal Administrative Databank (LAD), Statistics Canada, Table 11-10-0055-01

The LAD is constructed from a 20% sample of T1FF forms, which are submitted annually by tax filers in Canada, based on social insurance number. This dataset focuses on income distributions in Canada, divided into percentiles based on total income, which is defined as all income across specific sources with no taxes applied. The publicly available table contains information about select percentiles at the high end. In addition, it provides information on demographics, including gender, marital status and citizenship. The data are available on a yearly basis starting in 1982.

Distribution of Household Economic Accounts (DHEA), Statistics Canada, Table: 36-10-0660-01

The DHEA is constructed from the National Balance Sheets at Statistics Canada together with data from several surveys, including the Survey of Labour and Income Dynamics, the Canadian Income Survey, the Survey of Household Spending and the Survey of Financial Security. It is available yearly from 2010 to 2019, and some aspects of the data are available on a quarterly basis starting in 2020. The DHEA collects information on the wealth, assets and liabilities of the general population. Assets are divided into financial assets and non-financial assets, the latter including real estate. Liabilities are divided into mortgages and other liabilities. Liabilities subtracted from assets then produces net worth. Information is available at the household level grouped by income quintile and age.

Canadian Income Survey (CIS), Statistics Canada, Table 11-10-0134-01 and Table 11-10-0239-01

The CIS is a cross-sectional survey from a subsample of the Labour Force Survey. The Labour Force Survey is a rotational panel wherein households in the panel are surveyed quarterly about labour-related topics. A subsample of these households are then called for further information about personal income, household income and work activities, which are then used to calculate additional statistics such as GINI coefficients.

B: Definitions of the three income measures

Market income

Statistics Canada defines market income as referring to the sum of:

- employment income (wages and salaries, net farm income and net income from non-farm unincorporated business and/or professional practice)
- investment income
- retirement pensions
- superannuation and annuities (including those from registered retirement savings plans and registered retirement income funds)
- other money income

It is equivalent to total income before taxes minus all government transfers and is also referred to as income before transfers and taxes.

Total income

Total income refers to receipts from certain sources, before income taxes and deductions, during a specified reference period. The monetary receipts included are those that tend to be of a regular and recurring nature. Receipts that are included as income are:

- employment income
- income from investment sources
- income from employer and personal pension sources
- other regular cash income, such as child support payments received, spousal support payments (alimony) received and scholarships
- income from government sources

Receipts excluded from this income definition are:

- one-time receipts, such as lottery winnings, gambling winnings, cash inheritances, lump-sum insurance settlements and tax-free savings account or registered retirement savings plan withdrawals
- capital gains
- employers' contributions to registered pension plans, Canada Pension Plan, Québec Pension Plan and Employment Insurance
- voluntary interhousehold transfers, imputed rent, goods and services produced for barter and goods produced for own consumption.

For more information, see Statistics Canada, "Total income," Dictionary, Census of Population, 2016.

After-tax income

After-tax income refers to total income less income taxes of the statistical unit during a specified reference period. Income taxes are the sum of federal and provincial or territorial income taxes, less abatement where applicable. Provincial and territorial income taxes include health care premiums in certain jurisdictions. Abatement reduces the federal income taxes payable by persons residing in Quebec or in certain self-governing Yukon First Nation settlement lands. For more information, see Statistics Canada "After-tax income," Dictionary, Census of Population, 2016.

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