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Well-being and sustainability

Experimental Sub-annual Distributions of Household Economic Accounts – Experience from Statistics Canada

Prepared by Statistics Canada*

Summary

This paper focuses on the development of new experimental sub-annual distributional results by Statistics Canada. While in the past sub-annual distributional macroeconomic accounts were not a priority for a statistical agency since most distributional results indicate that household economic conditions are slow changing, the Covid-19 pandemic brought about such immediate and unprecedented impacts on the economic well-being of households that it was necessary to construct sub-annual distribution estimates. These data aim to provide insights into the impact of the Covid-19 pandemic on household economic well-being, and to what extent government support measures have mitigated these impacts for various segments of the population. The paper discusses the data sources, methods and assumptions used to derive sub-annual estimates. The main findings for the first three quarters of 2020 as well as some of the data limitations are also discussed.

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I. Introduction

1. Over the past several years Statistics Canada has put a lot of effort into building distributional dimensions into household macroeconomic indicators in order to enrich the understanding of economic developments and provide assessment of vulnerabilities of specific groups and the resulting implications for economic well-being and financial stability. The agency has developed a set of Distributions of Household Economic Accounts (DHEA) which provide estimates of income, consumption, saving and wealth distributed by a number of dimensions, including equivalized income quintile, age, generation, housing tenure, housing composition and region. Annual distributions of household income, consumption and saving are available from 1999 to 2019, while estimates for wealth are available from 2010 to 2019.

2. The annual DHEA developed by Statistics Canada provide important information on disparities among households. However, the Covid-19 pandemic has had profound effects on the economic and financial stability of households that policy makers are in search of more timely information to help them address these new challenges. While perhaps in the past sub-annual distributional macroeconomic accounts did not seem necessary or worth the investment for a statistical agency, since most distributional results indicate that household economic conditions are slow changing, the pandemic brought about such immediate and unprecedented impacts on the economic well-being of households that it was necessary to construct sub-annual DHEAs.

3. On March 1, 2021 Statistics Canada released for the first time, sub-annual DHEAs, which provide experimental estimates of income, consumption, saving and wealth by various household distributions for the first three quarters of 2020. One of the main goals of these sub-annual DHEAs was to provide insight into how the pandemic and the associated government support measures have affected the economic well-being of different groups of households in Canada.

4. As with all data, these experimental sub-annual DHEA are not without their limitations. For the most part these experimental data rely on the same concepts and methods as the annual DHEA. However, in order to produce the DHEA on a sub-annual basis new data sources were used and assumptions were made. The following paper provides an overview of the new sources and estimation assumptions used to produce the sub-annual DHEA as well as some of the main findings for the first three quarters of 2020.

II. Deriving sub-annual Distributions of Household Economic Accounts

5. Statistics Canada used for the most part the same concepts, methods and data sources from the annual Distributions of Household Economic Accounts (DHEA) to produce the sub-annual estimates. However, in an effort to estimate the impact of the Covid-19 pandemic on the economic well-being and financial stability of households in Canada, the sub-annual DHEA held constant the demographic and socio-economic conditions of the previous year when estimating changes in income, consumption, saving and wealth throughout the first three quarters of 2020. It is therefore assumed that all households remained in their same distributional category (e.g. age, income quintile, household composition etc.) as they did in 2019.

6. This assumption was made for two reasons. First, the full spectrum of micro data used to estimate household distributions for the DHEA are not available for 2020 or on a sub-annual basis. Second, by holding constant the demographic characteristics of 2019, it was possible to estimate changes in various household economic indicators without intersecting changes from switching distributional groups. This approach can help enrich the analysis of which households have been most affected by the Covid-19 pandemic, the associated economic restrictions and government support measures.

7. As with the annual DHEA, the sub-annual estimates relied on the Social Policy Simulation Database and Model (SPSD/M) to distribute aggregate estimates of Household

Disposable Income and many of its sub-components to household groups. The sub-annual DHEA used a new SPSD/M glass box model which was developed by Statistics Canada in 2020 to help understand the impact of government Covid-19 economic relief measures.

8. The experimental sub-annual DHEA used version 3.0 of the SPSD/M glass box model released by Statistics Canada in October 2020. This SPSD glass box model incorporated all of the government provided Covid-19 economic relief measures up to the end of September 2020 as well as a labour adjustment module, which using data from the Labour Force Survey (LFS), transformed employment and labour income from annual to weekly variables. Modifications were made to version 3.0 of the SPSD/M glass box model to further align employment by industry and employment by wage group with trends from the LFS up to September 2020. An overtime module was also added in order to allocate supplementary wages based on additional hours worked by industry and wage group.

9. Microdata on the Canadian Emergency Response Benefit (CERB)¹, one of the main government provided Covid-19 support measures to households, was used to allocate payments of CERB to individuals. This allocation was done at the person level by age and by region prior to rolling up to the household level.

10. Sub-aggregate data purchased from one of the main consumer credit rating agencies in Canada was used to estimate sub-annual changes in household liabilities. Quarterly data on outstanding debt balances by type of credit product (mortgage, credit card, car loan etc.) for various groups of households (e.g. age of household head, household composition, and household tenure) were used to distribute the quarterly national household balance sheet account.

11. Finally, in some cases there was no sub-annual microdata available to distribute aggregate household indicators. This was the case for Household Final Consumption Expenditure and household assets in the balance sheet. In these cases quarterly growth rates from the aggregate indicator were applied proportionally to all household distributions. In a few cases adjustments were made to the sub-annual distributions using proxies from other variables, as was done for real estate assets by age using growth in mortgage liabilities.

12. The experimental sub-annual DHEA developed by Statistics Canada are not without their limitations. Scarcity of timely microdata on various household economic indicators such as consumption expenditure meant that notable assumptions had to be made. However, despite the drawbacks, the experimental DHEA have helped enrich the analysis about the economic impacts on households from the Covid-19 pandemic and the associated government relief measures. By holding constant the demographic characteristics of 2019 these data reveal that the Covid-19 pandemic has not affected all households in the same way.

III. Lessons learned and moving forward

13. The development of sub-annual Distributions of Household Economic Accounts (DHEA) has been an important learning process for Statistics Canada. Achieving a balance between the need for timely information to help guide public policy and producing high quality data was top of mind throughout the process.

14. The development of the sub-annual DHEA amplified the scarcity of timely sub-annual household microdata. In order to compile distributions on a quarterly basis we had to rely less on our traditional survey and administrative data sources, as these were either not available on a sub-annual basis or were only available with significant time lags. Instead we exploited available microsimulation models to derive distributions for employment based income variables and purchased data from a private enterprise to track changes in household liabilities.

¹ The Canada Emergency Response Benefit (CERB) was a government provided financial support to employed and self-employed Canadians who were directly affected by COVID-19. Applicants received \$2,000 CAD for a 4-week period (the same as \$500 CAD a week), between March 15 and September 26, 2020.

15. The reliance on such limited information meant we had to make broader assumptions about household's economic and financial conditions. To mitigate this, we took extra effort to consult with a wide range of colleagues from various subject matter areas to help quality assure and evaluate our assumptions and results. This consultation process was very impactful as it led us to modify assumptions used to determine individuals' employment status and thus their sources of income. The internal consultations also helped build stronger connections between people working on micro versus macro data programs. Given that the DHEA are a bridge between the micro and macro data, these working relationships are critical and require strong collaboration and communication.

16. Another lesson learned by compiling sub-annual DHEA was that we need to provide clear communication with external data users and policy makers as to the concepts of distributional accounts and their differences with various micro data on economic conditions of individuals and households. For example, most of the sub-annual microdata available and used in the compilation of the sub-annual DHEA, such as the Labour Force Survey and some administrative data on government Covid-19 support measures, pertained to individuals, not households. Therefore, the compiled DHEA estimates did not necessarily provide the same distributional outcome as suggested by microdata that many users were expecting. We took steps to reassure our data users that the micro data they were relying on was a major input into the DHEA results, while explaining some of the reasons, such as the difference between the individual and household concept and the use of equivalized income quintiles, for the sometimes different or unexpected results. In the end we learned that going forward we will need to put more effort into communicating to our users the various conceptual and measurement differences between micro and macroeconomic data.

17. Ultimately, the information obtained from the sub-annual DHEA as well as the feedback that we received from data users, proved that the effort was worthwhile. The experimental results illustrated that the Covid-19 pandemic had differing impacts on the economic well-being of households and that their conditions changed notably within the year. As a result, Statistics Canada intends to continue producing sub-annual DHEA for the foreseeable future. This information will be critical for understanding the impacts and potential inequalities of the pandemic and the economic recovery on households. The experimental DHEA estimates will be updated and released to the fourth quarter of 2020 in the spring of 2021 and thereafter will follow a set quarterly cycle. Over time as new microdata become available, the assumptions used to produce the estimates will be reviewed and refined.

IV. Experimental results for the first three quarters of 2020

18. On March 1, 2021 Statistics Canada released for the first time, sub-annual DHEAs, which provide experimental estimates of income, consumption, saving and wealth by various household distributions for the first three quarters of 2020. One of the main goals of these sub-annual DHEAs was to provide insight into how the pandemic and the associated government support measures have affected the economic well-being of different groups of households in Canada. The remainder of this paper highlights the main findings from these experimental estimates.

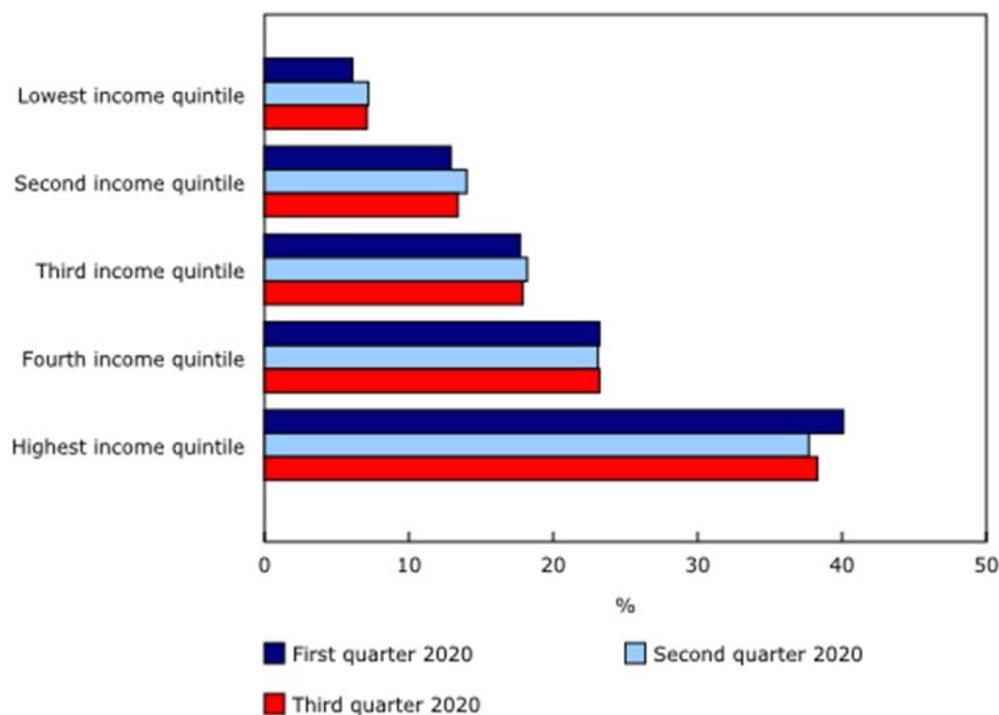
V. Gap between lowest- and highest-income households declines in 2020

19. Although the everyday experiences of particular households may have differed, on average, the gap in household disposable income between the lowest- and highest-income earners declined in 2020. Households in the lowest income quintile increased their share of disposable income from 6.1% in the first quarter to a high of 7.2% in the second quarter of 2020, while those in the highest income quintile decreased their share from 40.1% to 37.7% over the same period.

20. Changes in income distribution were led by strong growth in current transfers received by the lowest-income households as the value of government COVID-19 support measures exceeded losses in wages and salaries and self-employment income.

Figure 1

Distribution of household disposable income by income quintile, first to third quarter 2020



VI. Stronger rebound in disposable income for lower-income and younger households

21. In the early months of 2020, because of volatility in financial markets and as the emergence of COVID-19 cases led to various restrictions in economic activity across the country, disposable income declined for all households in Canada. Led by significant increases in government support measures, household disposable income rebounded in the second quarter, with the largest gains for the lowest-income earners (+33.6%) and youngest households (+20.1%).

22. Hypothetically, if the federal government had not introduced its support measures to counteract the negative impacts of the pandemic, overall household disposable income would have fallen by 3.6% in the second quarter. The largest declines would have occurred for middle- and lower-income earners, as well as younger households.

23. As the economy began to recover in the third quarter of 2020, relatively muted gains in disposable income occurred for higher-income earners (+5.5%) and workers aged 55 to 64 (+6.1%), while lower-income earners and younger households held onto gains achieved earlier in the second quarter.

Figure 2

Change in average household disposable income by income quintile, first to third quarter 2020

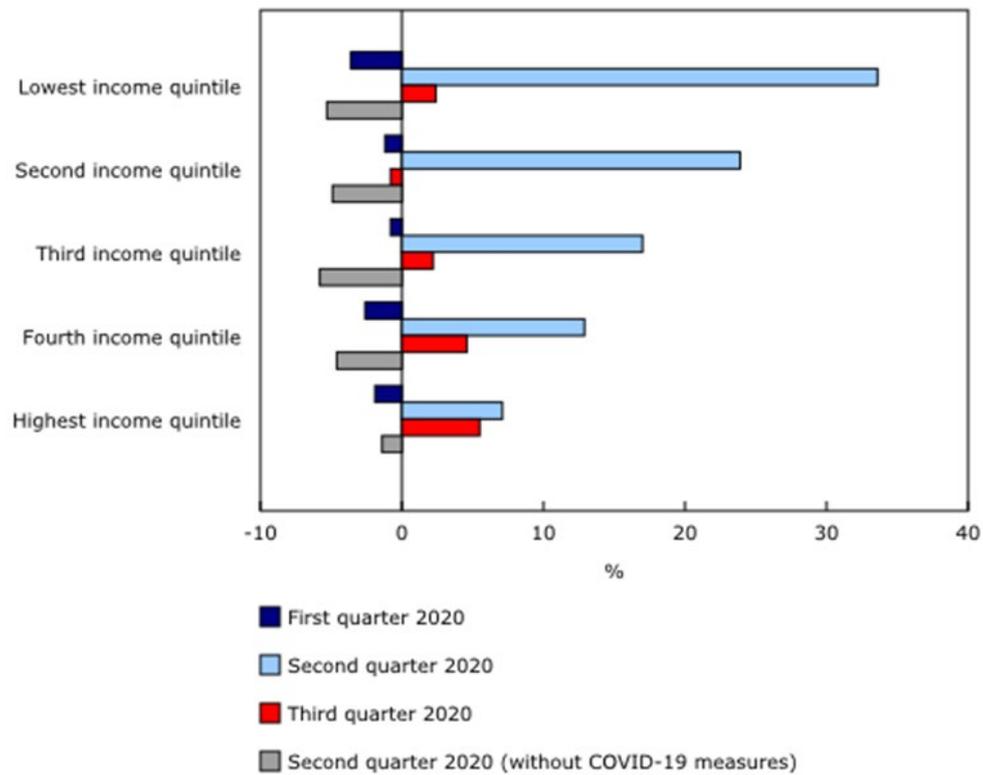
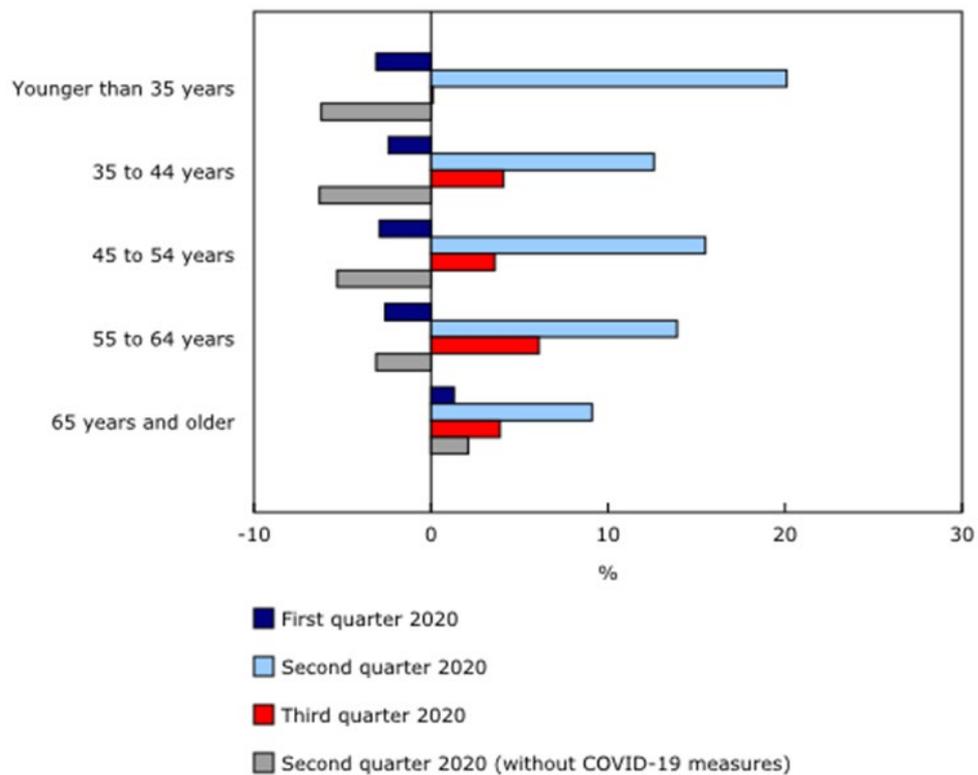


Figure 3
Change in average household disposable income by age group of major income earner, first to third quarter 2020



VII. Lowest-income and youngest households experience largest decline in wages and salaries

24. As the pandemic began to unfold in Canada, compensation of employees, of which wages and salaries are the biggest component, fell the most in the first quarter of 2020 for lower-income earners (-3.7% for the lowest income quintile and -2.3% for the second income quintile) and the youngest households (-1.6%). As more economic restrictions were implemented to combat the spread of the virus, wages and salaries declined for all households in the second quarter, with lower-income households recording the steepest losses. As economic restrictions were loosened in many parts of the country throughout the summer, wages and salaries rebounded in the third quarter, with notable gains for all households. Despite these improvements, wages and salaries did not return to their first-quarter level for many households, except those with a major income earner younger than 35 or aged 55 or older.

25. Mixed income, earned through self-employment, declined for all households in both the first and the second quarters of 2020, with the largest cumulative declines occurring for the lowest-income households (-31.9%), as well as those with a major income earner aged 55 to 64 (-17.2%). As with wages and salaries, self-employment income rebounded sharply in the third quarter as economic activity recovered. The same households that saw the biggest declines in self-employment income in the first two quarters recorded the largest gains in the third quarter.

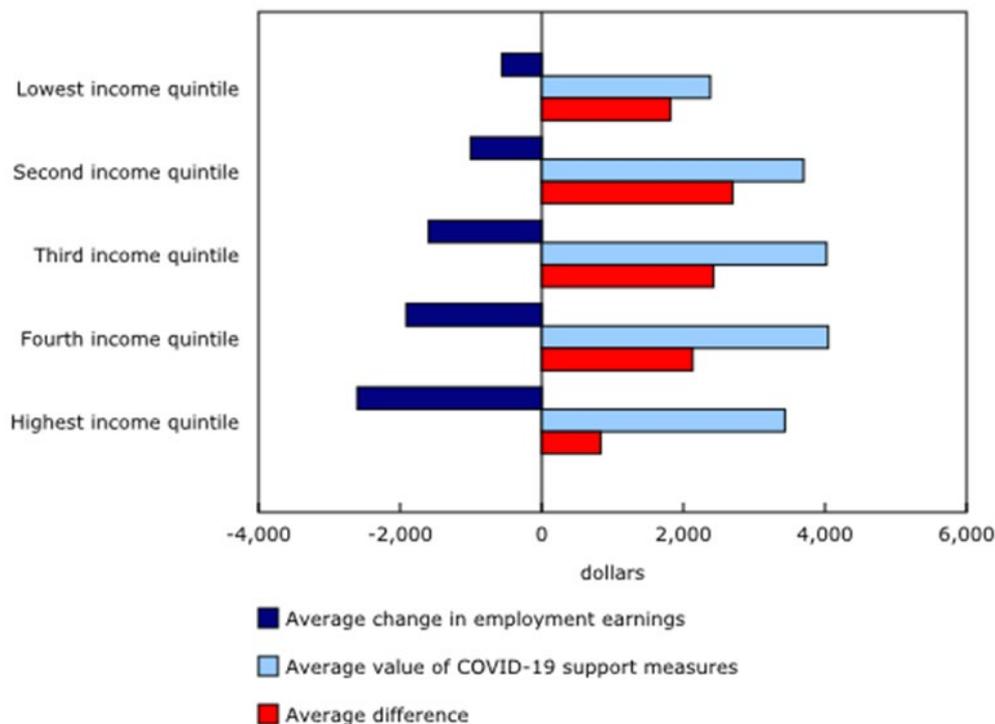
VIII. The value of COVID-19 support measures exceeds losses in wages and salaries and self-employment income

26. The introduction of various COVID-19 support measures led to an unprecedented increase in current transfers (+57.6%) to all households in the second quarter of 2020. Although households did experience notable declines both in wages and salaries and in self-employment income in the second quarter, the value of COVID-19 support measures provided by governments more than compensated for those losses. The difference between the value of COVID-19 support measures and decreased wages and salaries and self-employment income in the second quarter was most pronounced for middle-income households, as on average they gained roughly \$2,500² more than they lost. On average, young and middle-aged households gained around \$3,000 more through COVID-19 support measures than they lost in wages and salaries and self-employment income in the second quarter.

27. As lockdowns were eased and people returned to work in the third quarter, the value of government COVID-19 support measures declined for all households. Still, households received on average between \$1,000 and \$2,600 through COVID-19 support measures in the third quarter of 2020.

² The dollar values quoted in this text are expressed in nominal CAD. As of April 6 2021 the CAD to USD exchange rate was \$0.80 and the CAD to € was \$0.67.

Figure 4
Average change in employment earnings compared with the value of COVID-19 support measures, by income quintile, second quarter 2020



IX. COVID-19 support measures have largest impact on lower-income and younger households

28. Although a larger proportion of the total value of government COVID-19 support measures went to middle- and upper-income earners and middle-aged households, the impact of the benefits was greater for lower-income and younger households. Over the first three quarters of 2020, the value of government COVID-19 support measures represented 16.4% of disposable income for the lowest-income earners and 11.3% for the youngest households, compared with 4.3% for the highest-income earners and 4.2% for the oldest households.

X. Households increase their net saving in 2020

29. Households experienced unprecedented gains in net saving in 2020 because of a combination of higher disposable income, driven by the introduction of COVID-19 support measures, and lower consumer spending as a result of lockdowns that limited economic activity. While all households increased their net saving in the second quarter, the improvement did not carry through to the third quarter for the lowest-income households. Middle-income earners saw some of the biggest improvements, as they moved from a net dissaving to a net saving position—the first time that this has been observed for middle-income earners in the DHEA estimates, which date back to 1999.

XI. Lowest-income and youngest households see largest gains in wealth

30. Similar to the trends in net saving, households increased their wealth in 2020 despite negative economic pressures introduced by the pandemic. Relative to 2019, household net worth grew by 5.2% up to the third quarter of 2020, reaching an average of \$786,000 per household.

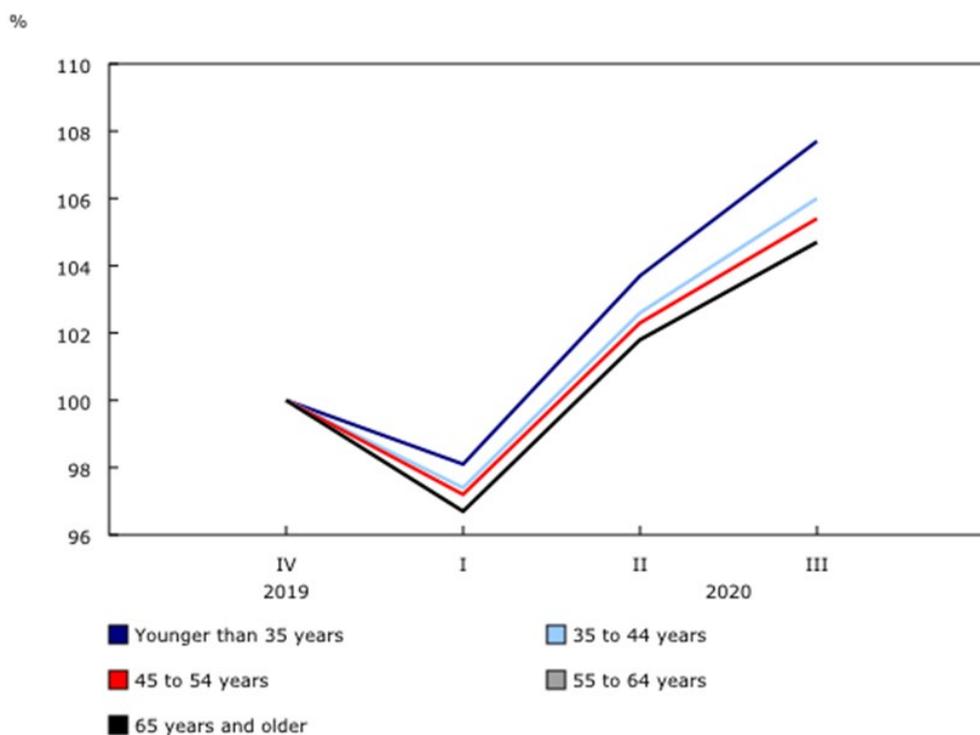
31. However, households did not benefit equally from the overall increase in net worth. Wealth for households in the lowest quintile of disposable income grew more than for other households, up 6.3% as of the third quarter of 2020 relative to 2019, compared with 4.8% for those in the highest income quintile. Gains in net worth for the lowest-income households occurred as increases in the value of their real estate holdings outweighed increases in the value of mortgage debt acquisitions, while they reduced their non-mortgage debt balances more than higher-income households.

32. Meanwhile, fluctuations in wealth for the highest-income earners were driven more by volatility in financial markets, as they held more in investment funds relative to lower-income earners. The highest 20% of income earners accounted for 55% of the \$470 billion reduction in the value of financial assets that occurred in the first quarter of 2020 relative to the end of 2019. Similarly, along with a recovery in financial markets, the highest-income earners accounted for more than half of the subsequent \$677 billion increase in financial asset values as of the end of the third quarter of 2020.

33. The trends in net worth also varied by age. Although households with a major income earner younger than 35 held the least wealth of any age group as of the third quarter of 2020, at \$220,200, compared with almost \$1.3 million for those with a major income earner aged 55 to 64, they increased their average net worth by more than older households. Driven by gains in value in the acquisition of real estate and consumer goods—such as cars, appliances and electronics—that outpaced growth in debt obligations, households with a major income earner younger than 35 grew their net worth by 7.7%, while net worth for those with a major income earner aged 55 or older grew by 4.7%.

Figure 6

Quarterly change in net worth by age group of household major income earner, indexed to fourth quarter 2019



XII. Low lending rates facilitate home buying for lower-income and younger households

34. Although the pandemic greatly reduced job security for many households in 2020, lower-income earners and younger households acquired mortgage debt at a faster pace than other households as they were encouraged by dramatically reduced mortgage lending rates offered by financial institutions. While mortgage lending rates dropped to historic lows,

falling to about 2% by the end of the third quarter, average mortgage debt for the lowest-income households increased 5.4% from the end of 2019, while households with a major income earner younger than 35 increased their mortgage debt by 5.8%.

35. Even though lower-income earners (+7.7%) and younger households (+7.9%) increased their mortgage liabilities by more than other households, they were also less leveraged as real estate values grew at an even faster pace. From the end of 2019 to the third quarter of 2020, the ratio of mortgage debt to real estate assets decreased from 32.9% to 32.2% for the lowest-income earners, and from 51.7% to 50.7% for the youngest age group.

36. Meanwhile, because of relatively limited real estate acquisitions for higher-income earners and older age groups, their ratio of mortgage debt to real estate assets remained unchanged, at around 20.0% for those in the highest income quintile, about 19.0% for those aged 55 to 64 years, and close to 7.0% for those aged 65 years and older.

XIII. Lower-income households limit balances on credit cards and non-mortgage loans

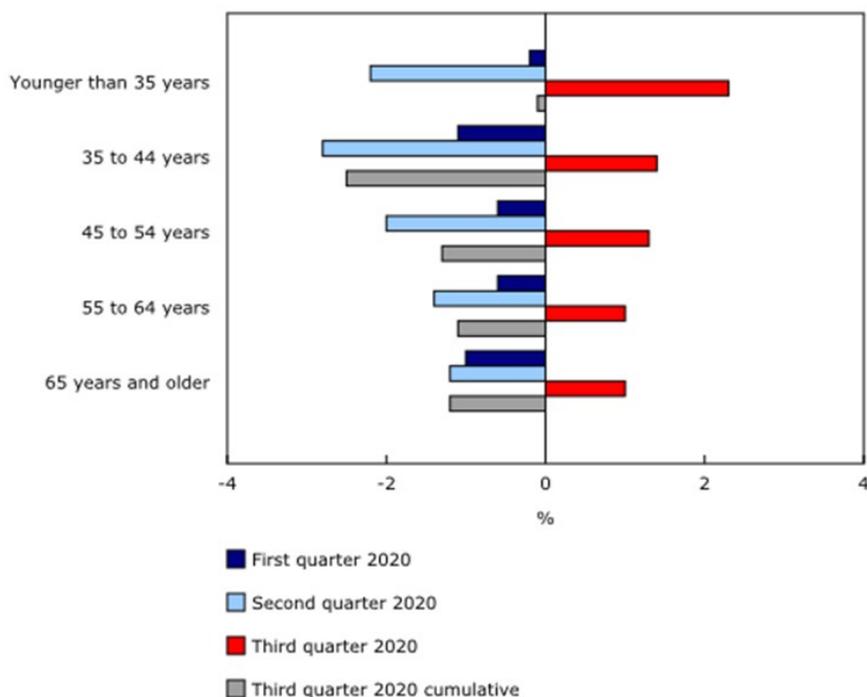
37. Non-mortgage debt—credit card balances, car loans, etc.—fluctuated more than mortgage debt over time, as it decreased for households in each income quintile with the onset of the pandemic in the first half of the year, and then grew in the third quarter as lockdown measures were eased. Over the entire period, households in the lowest income quintile restricted their non-mortgage debt acquisitions more than other households. From the end of 2019 to the third quarter of 2020, average non-mortgage debt decreased by 1.8% for households in the lowest income quintile, compared with a reduction of 1.0% for those in the highest income quintile.

XIV. Younger households limit non-mortgage borrowing despite acquiring more consumer goods

38. Households with a major income earner younger than 45 tended to reduce their credit card and non-mortgage loan balances in the first half of 2020 and limited their borrowing to purchase consumer goods in the third quarter as restrictions on retail operations eased. Although the value of consumer goods held by those younger than 35 increased by 4.9% in the third quarter, the highest growth of any age group, most of these purchases were financed through savings or debt consolidation rather than through additional borrowing; their non-mortgage debt grew by 2.3% in that same quarter. The total value of consumer goods held by those younger than 35 was up 4.7% as of the third quarter of 2020 compared with 2019, while non-mortgage debt remained unchanged over that period.

Figure 7

Average non-mortgage debt by age group of household major income earner, quarterly and cumulative change up to third quarter 2020



XV. Large shifts in debt-to-income ratios for lower-income and younger households

39. The debt-to-income ratio fluctuated greatly throughout 2020, especially for lower-income earners and younger workers. Along with reductions in income attributable to the onset of the pandemic, households in the lowest income quintile increased their ratio from 289.5% at the end of 2019 to 301.8% by the first quarter of 2020. Their ratio dropped to 227.0% in the second quarter as governments introduced support measures for those who lost their jobs or had a reduction in work hours. As business shutdowns eased in the third quarter, the debt-to-income ratio for the lowest-income earners stabilized as they regained employment or increased their hours of work. In contrast with other households, the debt-to-income ratio for those in the second income quintile grew by 4.7 percentage points, reaching 182.2% in the third quarter, because of a combination of increased mortgage debt and reductions in government benefits that outweighed gains in employment income.

40. While the debt-to-income ratio for younger and core-age workers benefited from the introduction of a range of government benefits in the second quarter of 2020 to mitigate the economic impacts of the pandemic, ratio reductions for those aged 55 and older were driven by a combination of reduced debt and moderate growth in disposable income.

41. In contrast with other age groups, households with a major income earner younger than 35 increased their debt-to-income ratio in the latter half of 2020, rising from 186.7% in the second quarter to 191.8% in the third quarter. Similar to lower-income earners, the youngest households increased their debt-to-income ratio in the third quarter as increased mortgage acquisitions outweighed income gains. Despite recent increases in the debt-to-income ratio for lower-income and younger households, their ratios remained far below those that existed prior to the pandemic.

42. As the economy continues to evolve in response to the challenges introduced by the pandemic, future DHEA releases will shed further light on the state of household economic well-being, including developments in the trends for income, consumption, saving and wealth.

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