Accounting for the Decline of Canada's Real GDP Per Capita since Mid-2022

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Abstract

Real GDP per capita has been falling in Canada since mid-2022, while the number of non-permanent residents has been rising sharply. This article discusses how these two developments are linked. The paper identifies six factors currently influencing real GDP per capita: (1) labour productivity; (2) average hours worked per job; (3) the employment rate of the working-age population; (4) the ratio of the working-age population to the permanent resident population (where working-age includes NPRs in that age class); (5) the share of permanent residents in the total population; and (6) the relative rate of growth of the government and non-profit sectors compared to that of the business sector. The relative importance of each of these factors is assessed via a multiplicative decomposition and the analysis indicates the share of permanent residents in the total population is currently the single most important factor.

Real gross domestic product (GDP) per capita (or real domestic income per capita), defined as GDP with inflation removed and divided by the total population, is an important indicator of changes in Canadians' well-being through time.[2]

The track of GDP per capita over the last 77 years reveals a strong upward trend, with the index more than tripling over the entire period (Chart 1). The upward trend is interrupted occasionally and these disruptions are closely related to the business cycle (the C.D. Howe Institute's dates for Canadian recessions are shaded).

As shown in Chart 1, Canada's GDP per capita followed the path of its U.S. counterpart fairly closely until the recession of 1990-1992, when it fell behind. It has not closed the resulting gap, but did continue along a path parallel to the United States until around 2015 when Canada experienced a mini-recession related to falling world energy prices (evident but not shaded in Chart 1). From that

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2 GDP is not the whole story, of course. Well-being is also affected by other factors, notably externalities such as pollution, the availability of leisure time, income distribution, life expectancy and the degree of social harmony. But these additional factors are not the subject addressed here.

Chart 1: Real GDP per capita in Canada and United States, Quarterly Index, 1947 Q1 to 2024 Q1, Seasonally Adjusted
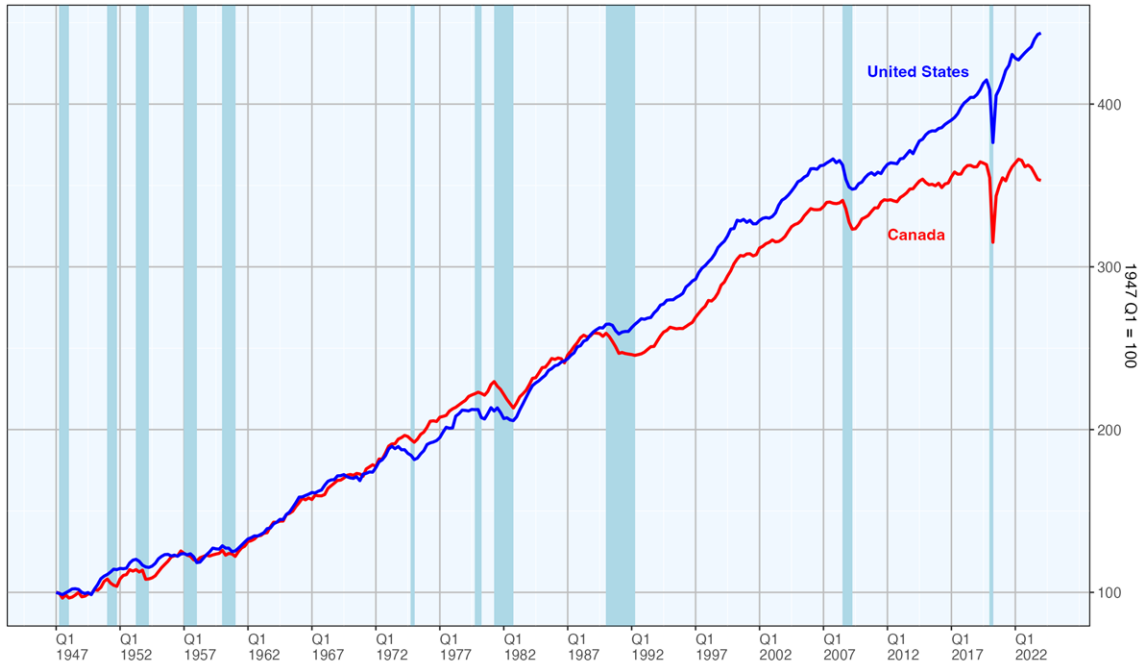
Note: Statistics Canada's official GDP time series covers the period from the first quarter of 1961 to date and is calculated based on the 2008 international standard System of National Accounts. To extend this time series back to 1947 Q1, Statistics Canada's historical estimates based on the 1968 international standard System of National Accounts were linked. The estimates from 1961 to date are therefore a quarterly chained Fisher volume index while those for the period prior to 1961 are an infrequently chained Laspeyres index.
Source: Statistics Canada vectors v87224024, v62305752 and v1 and author's calculations. U.S. Bureau of Economic Analysis NIPA table 7.1.
Shaded areas are recessions.

point on, the gap began to widen further and quite considerably as Canada's productivity growth slowed while U.S. productivity grew more quickly.

The focus of this article is on the most recent four years shown in the chart, which were impacted by the COVID-19 pandemic and its aftermath. GDP per capita plunged in early 2020 when the economy was put on lockdown, affecting both production and spending as everyone sought to minimize the spread of infection. But the economy rebounded quickly as people and businesses found adjustments that allowed for an opening up of activities while still countering the virus' spread.

By 2022, real GDP and inflation were surging. Real GDP grew at a 3.9 per cent

average annual rate in the first two quarters of that year while the CPI rose at a 9.0 per cent rate on the same basis. Many other countries faced a similar situation. Central banks around the world, including the Bank of Canada, raised interest rates to slow their economies down. Canada's GDP growth did indeed slow, growing on average at an annual rate of just 0.9 per cent in the following seven quarters to 2024 Q1. The labour market, which had attained record low unemployment rates and high job vacancy rates in 2022, loosened considerably (Chart 2). Unemployment rates edged up slightly in the United States as well, but American GDP growth, after also slowing in mid-2022, resumed its extraordinary strength with 2.2 per cent average

Chart 2: Canadian Unemployment and Job Vacancy Rates, Monthly, October 2015 to April 2024, Seasonally Adjusted
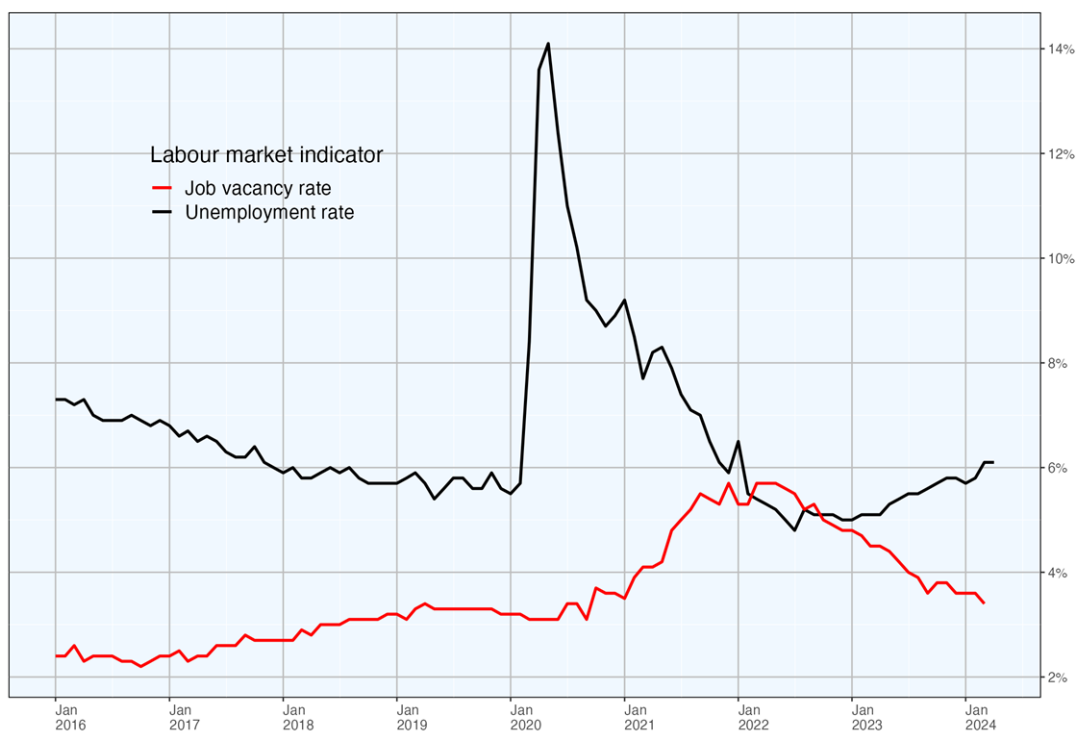
Source: Statistics Canada vectors v2062815 and v1446283289. Job vacancy statistics begin in October 2015.

quarterly growth at an annual rate between 2022 Q2 and 2024 Q1.

So why has GDP per capita been falling in Canada for several quarters? Unlike in previous episodes where Canada's GDP per capita has decreased substantially, this time modest economic growth continues. There is no apparent recession. What explains the difference and what policy action can be taken to turn this declining trend around without at the same time allowing a resurgence of inflation? These are the questions addressed in this article.

Population Growth and Non-permanent Residents

An unusual aspect of Canada's economy today, relative to the last 50 years, is the high rate of population growth (Chart 3).

Population normally grows at a slow and fairly predictable rate. It increased 1.1 per cent a year on average in the half-century from 1972 to 2021 with a standard deviation of 0.2 per cent. Since mid-2022, however, it has risen much more rapidly: 2.1 per cent in 2022 and 3.2 per cent in 2023. This indicates that unlike in the previous postwar episodes where weak or falling GDP explained most of the drop in GDP per capita, this time unusually rapid population growth is a major factor as well. The denominator is as much a factor as the numerator in explaining developments this time around.

Why has the population risen so rapidly since mid-2022? It is not because of more rapid birth rates or falling death rates. Nor is it because of substantially higher rates of immigration which, following a pandemic-

Chart 3: Canadian Population Growth, Annual Percentage Change, 1947 to 2023
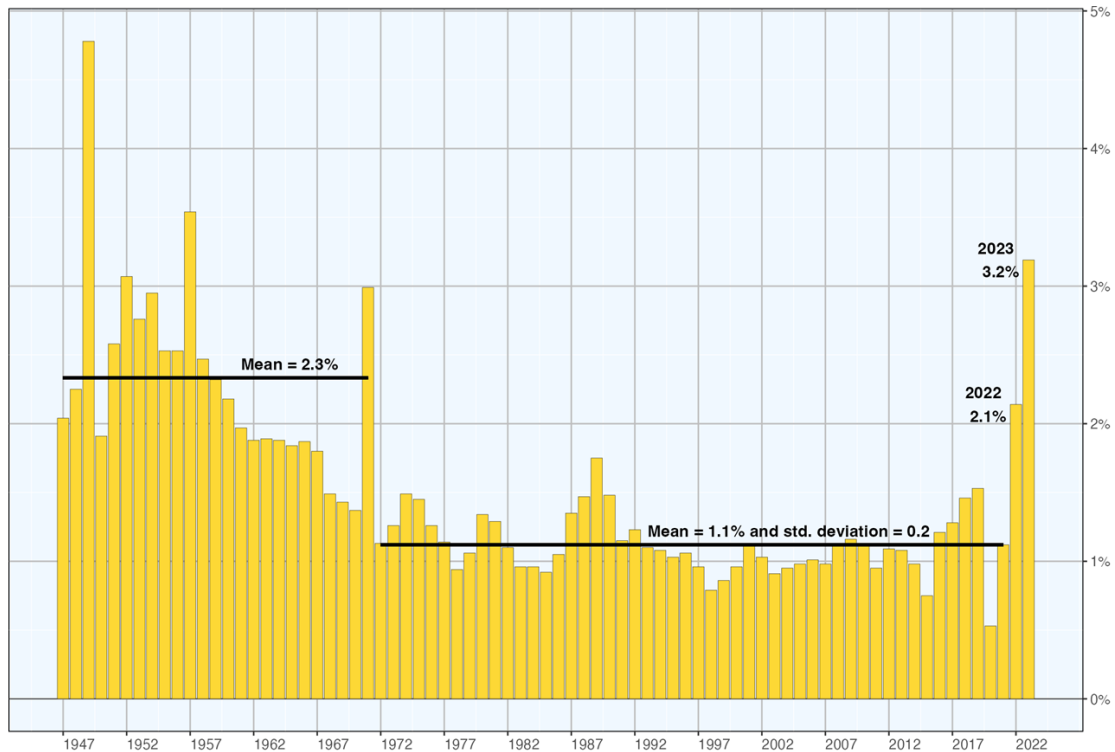
Note: Annual population is measured as the value on October 1 of each year. Source: Statistics Canada Vector v1.

related decrease to 185 thousand in 2020, were 406 thousand in 2021, 438 thousand in 2022 and 472 thousand in 2023. It is, rather, because of a huge inflow of non-permanent residents (NPRs).

The percentage of NPRs in the Canadian population crept up gradually between 1971 and 2016, rising from under 1 per cent to a little over 2 per cent (Chart 4). It then rose more quickly from 2016 to 2023, in particular in 2022 and 2023.It climbed to around 3.5 per cent of the total population where it plateaued during pandemic-related restrictions on cross-border travel. In 2022, however, the share of NPRs resumed its upward climb at an even faster pace, bringing the number of non-permanent residents in Canada to 6.5 per cent of the population by January 2024, some 2.7 million people. That is a

large number, equivalent to more than double the total population in each of five of Canada's ten provinces

The composition of Canada's NPR population has shifted over the last two and a half years (Chart 5). Study permit holders accounted for a substantial share of the increase but the largest share was attributable to temporary work permit holders.

Asylum claimants were 12 per cent of NPRs in the most recent quarter and 60 per cent of them had work permits. Aside from asylum claimants, students accounted for 38 per cent of all NPRs and about a third of them had work permits (as well as study permits). People with work permits only (who were neither asylum claimants nor students) accounted for 46 per cent of NPRs and the remainder were family mem-

Chart 4: Non-permanent Residents as a Percentage of the Population, Quarterly, 1971 Q3 to 2023 Q4, not seasonally adjusted

Note: Calculated by decumulating net non-permanent-resident inflows starting from Statistics Canada's published value for the stock of non-permanent residents at the end of 2023 Q4. Source: Statistics Canada tables 17-10-0121-01 and 17-10-0040-01.

Chart 5: Types of Non-Permanent Residents, Quarterly, 2021 to 2024 Q1
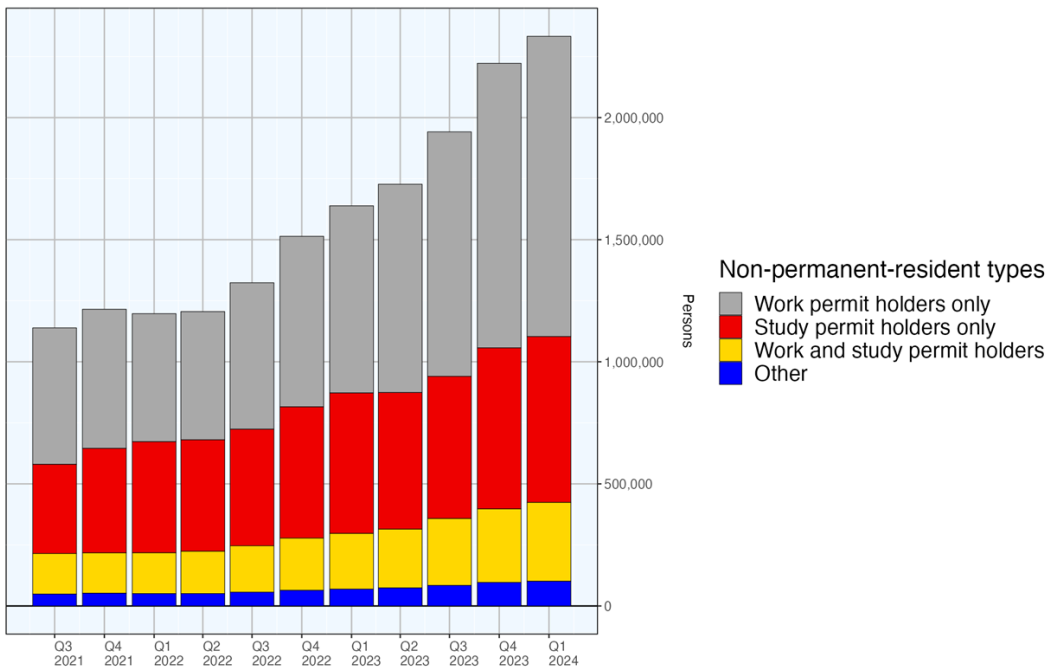
Note: The non-permanent resident types are mutually exclusive. The estimates here are for the first day of the quarter.
Numbers of asylum claimaints with study permits only and asylum claimants with work and study permits are very small.
Source: Statistics Canada Table 17-10-0121-01. The data in this Statistics Canada table begin in 2021 Q3.

bers and special cases, mostly without work permits. All told, about 65 per cent of NPRs had some kind of work permit, although based on census data for 2021, their labour force participation rate was substantially lower than 100 per cent (Tuey and Bastien, 2023).

The key question then is: What contribution to GDP is being made by the NPRs? If the recent influx of NPRs is causing the population to grow by 3.2 per cent a year instead of the 1.1 per cent or so seen in prior years, why is GDP growth not keeping up with this jump in population?

This is a question that cannot be answered with precision. We simply do not, at present, have the detailed statistical information about NPRs and their role in the economy that would permit a definitive analysis. But we have sufficient information to surmise their relative contribution to GDP is substantially less than that of the rest of the population (Canadian-born residents and immigrants).

Last year Statistics Canada released a study of the socio-economic characteristics of the NPR population using data for 2020 drawn from the 2021 Census of Population (Tuey and Bastien 2023). NPRs were found to be younger on average than the PR population. Of those who had jobs, more worked part-time and those who worked full-time in many cases worked less than a full year since some work permits have hours-per-week limitations and are for fixed-length work periods. According to

the study, 92 per cent resided in census metropolitan areas and 60 per cent lived in Ontario or British Columbia.[3]

Unfortunately, the Statistics Canada study contains no information about the earnings of NPRs.[4] However, it does reveal the top ten occupations for NPRs were low-wage occupations. They are:

- Nurse aides, orderlies and patient service associates;
- Light duty cleaners;
- Material handlers;
- Labourers in food and beverage processing;
- Transport truck drivers;
- Food counter attendants, kitchen helpers and related support occupations;
- Delivery service drivers and door-to-door distributors;
- Retail salespersons and visual merchandisers;
- Security guards and related security service occupations; and
- Other customer and information services representatives.

The information in the Statistics Canada study implies the overall impact of NPRs on GDP per capita is quite different from that of Canada's PRs. Their average productivity level is likely significantly lower because NPRs tend to work primarily in occupations paying relatively low wages per hour worked. In addition, it seems they tend to work fewer hours per annum than PRs. The per capita GDP contribution of NPRs looks to be substantially smaller

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3 Of Canada's total population, 38.9 per cent lived in Ontario and 13.8 per cent lived in British Columbia as of July 1, 2023. The percentage of the total population who lived in census metropolitan areas was 74.4.

4 The census requested earnings information from respondents, but the Tuey and Bastien study did not report any earnings information for non-permanent residents.

than that of PRs.

The relevance of the findings from the Statistics Canada study for what occurred in 2022 and 2023 must be qualified though, because it was based on census data for the pandemic year 2020. The results may be less applicable to the post-pandemic years 2022 and 2023 when the number of NPRs was so much bigger and when some important government policies vis-a-vis NPRs had changed.

Within the Temporary Foreign Worker Program, the federal government, in April 2022, increased the cap on the proportion of low-wage temporary foreign workers businesses could hire from 10 per cent to 20 per cent for all low-wage employers. Moreover, for low-wage employers in certain specific sectors it raised the cap to 30 per cent. These measures were in response to calls from businesses saying they were experiencing unskilled labour shortages (Employment and Social Development Canada, 2022 and 2023).

The government also adjusted its policies within the International Student Program. In 2022, it announced a number of measures intended to address the perceived shortage of unskilled labour, including extensions of the time period during which foreign students could remain in Canada after graduation and the temporary lifting of the 20-hour-per-week cap on the number of hours that eligible post-secondary students are allowed to work off-campus while class is in session (Immigration, Refugees and Citizenship Canada, 2022 a, b & c).

The unskilled labour shortage proved short-lived as the job vacancy rate began to drop in mid-2022 and the unemployment rate started moving up (Chart 2). In late 2023 and early 2024, the government took steps to unwind the policy changes relating to foreign student visas. In March 2024 it announced it would also cut back on the number of temporary foreign workers allowed in Canada and would do so gradually, over a three year period, aiming for an NPR-to-population ratio of 5 per cent by the end of 2026 (Immigration, Refugees and Citizenship Canada, 2024 a & b).

How NPRs Affect GDP and GDP per Capita

Working-age population growth can be expected to increase real GDP, though by how much will depend on the education and skill mix of the additional labour supply, and on how those people are employed. If the added labour supply is highly qualified but is employed in jobs requiring only low-level skills, the impact on GDP and productivity will clearly be lower. The 2021 census study stated that in 2020, NPRs were generally employed in jobs demanding education and skills below those they actually possessed (Tuey and Bastien, 2023).

We cannot know what real GDP growth would have looked like in 2022 and 2023 if there had been no NPR surge in those years, but it would probably have been weaker, especially in 2023. A rough 'back of the envelope' calculation, assuming a constant NPR employment rate of 65 per cent and average earnings of $25,000 per NPR, indicates total NPR earnings rose from about $21 billion in 2021 to $24 billion

in 2022 and \$35 billion in 2023.[5] An \$11 billion differential impact on GDP growth in 2023 would have been equivalent to just under 0.4 per cent of GDP. Statistics Canada reports an actual real GDP growth rate in that year of 1.5 per cent, so a rough estimate implies it would have been closer to 1 per cent without the NPR surge.

However, during the same period, real GDP per capita declined almost 2 per cent. This is because the relative increase in population greatly exceeded its relative impact on real GDP.

GDP per capita can be regarded as the population-weighted average of per capita production attributable to PRs and NPRs. As just mentioned, there are reasons to believe the latter is smaller than the former. As the weight of NPRs in the total population rose from around 3.5 per cent in 2020-2021 to 6.5 per cent by the end of 2023, this exerted a downward pull on the overall GDP-to-population ratio. There are, of course, other factors affecting GDP per capita in addition to the size and composition of the population. We explore these next.

Accounting for Changes in Real GDP per Capita

This article uses a multiplicative decomposition method to investigate the impact of factors affecting GDP per capita, in which real GDP per capita is defined to be the product of six important drivers, as follows:

$$\frac{GDP}{N} = \frac{GDP_b}{H_b} \cdot \frac{H_b}{J_b} \cdot \frac{J_b}{N_w} \cdot \frac{N_w}{N_p} \cdot \frac{N_p}{N} \cdot \frac{GDP}{GDP_b} \tag{1}$$

where:
- GDP = real total gross domestic product;
- N = total population;
- GDPb = real business sector gross domestic product;
- Hb = total hours worked in the business sector;
- Jb = number of jobs in the business sector;
- Nw = working-age population;[6]
- Np = permanent-resident population.

This decomposition framework is used below to analyze recent developments, us-

5 The minimum hourly wage in Canada varies by province and territory and the population-weighted average was \$15.88 in 2023. However, the considerable majority of NPRs appear to work in Ontario and British Columbia where the minimum wages are \$16.55 and \$16.75 respectively. In addition, some NPRs might receive more than the minimum wage. Assuming NPRs earn \$17 an hour on average, work 32.5 hours a week (30 per cent of permit-holders have study permits only and work part-time) and are employed for 50 weeks in the year would imply earnings of \$27,625. However, many NPRs are unlikely to work 50 weeks in the year and indeed some remain in Canada less than a year, so this crude estimate was reduced to \$25,000. In contrast, Statistics Canada's Survey of Employment, Payrolls and Hours indicated that average earnings of all employees were \$63,013 in December 2023. The crude estimate of \$25,000 a year for NPRs may be too low, but the point is simply that NPRs, on average, must surely have earned much less than PRs.

6 In this article the working-age population is defined as the portion of the Labour Force Survey target population consisting of persons between 15 and 64 years of age. The Labour Force Survey target population, in turn, consists of all persons 15 years of age or older, not living in the territories, First Nations people living on reserves. not in the military and not living in prisons or other live-in institutions. Accordingly the working-age population as defined here excludes persons over 65 years of age and older, most of whom are either fully retired or work part-time.

7 Lest there be any confusion, there is no hypothesis testing here. The six factors in the GDP per capita decomposition are chosen simply because they are believed to be important influencers. The decomposition reveals

ing quarterly statistics.[7]

The factors in equation (1) are measured using indexes scaled so the calendar average in 2017 = 100. This is also the practice followed by Statistics Canada in its table 36-10-0206-01, from which some of these time series are drawn.

The analysis is focused on the first difference of the logarithm of real GDP per capita, which implies an additive rather than a multiplicative relationship as in equation (2):

$$\Delta \ln \left(\frac{GDP}{N} \right) = \Delta \ln \left(\frac{GDP_b}{H_b} \right) + \Delta \ln \left(\frac{H_b}{J_b} \right)$$
$$+ \Delta \ln \left(\frac{J_b}{N_w} \right) + \Delta \ln \left(\frac{N_w}{N_p} \right)$$
$$+ \Delta \ln \left(\frac{N_p}{N} \right)$$
$$+ \Delta \ln \left(\frac{GDP}{GDP_b} \right)$$

(2)

To a close approximation, the first difference of the logarithm, when multiplied by 100, is equal to the percentage change when the relative changes are small.

The decomposition starts from the fact that GDP per capita is a ratio, with GDP in the numerator and population in the denominator. This ratio can be expressed as a product of other ratios that are thought to be important in explaining changes in GDP per capita, with the proviso that the numerators of the additional ratios must be the same as the denominators in other ratios, so they cancel out.

Empirically, as will be discussed further below, the most important driver is business sector labour productivity which dominates the others over the long run.[8] The other five macroeconomic drivers considered in this article, while they have been important over relatively short periods of time, in specific circumstances, have not changed greatly over longer stretches of time. Productivity, however, has trended up strongly over the long run, increasing more than three-fold since the Second World War. The pace and composition of non-human capital formation, human capital upgrading, knowledge accumulation and technical change all help explain growth in labour productivity over time and have an outsized effect on GDP per capita.

Why the emphasis on labour productivity in the business sector rather than for the total economy? Simply because we have no good way to measure the productivity of the non-business sector. Its output is not sold in the market and, therefore, does not have a well-defined value. We know what it costs, but not what it is worth. Statistics Canada's measure of labour productivity change in the non-business sector is the deflated value of inputs - because there is no measure of the market value of outputs - divided by the number of hours worked in the sector. But if the total deflated value of inputs rises more rapidly than the value of hours worked in the non-business sector this does not imply that productivity is rising in any meaningful sense. Statistics

their relative importance over time.

8 Statistics Canada, in its labour productivity statistics Tables 36-10-0206 and 36-10-0207, works with the concept of jobs rather than persons employed and that is also the approach adopted here. One person employed can of course have more than one job.

Canada and most other national statistical agencies adopt the convention of measuring the numerator, conceptually the real value of its output, as the value of its inputs simply because they have no better way to do it. No doubt there is true productivity change in the non-business sector, but in the absence of market-based output values it cannot really be measured.

One of the other factors that can have an influence, though typically over shorter periods of time, is average hours worked per business sector job. If the working population works longer or shorter hours, this will have a corresponding impact on real GDP per capita. But unlike labour productivity, which has proven over a long period of time to trend upward indefinitely, there are limits on the average number of hours a person employed can work in a given time period. Short-term fluctuations in average hours worked per job can sometimes affect GDP per capita significantly as they did, for example, in the early months of the COVID-19 pandemic, but they are unlikely to be a consistent driving force over an extended period.

Another factor is the number of business sector jobs expressed as a ratio to the working-age population.[9] This driver is similar to the previous factor, but rather than focusing on the amount of work done in the average job it focuses on the number of jobs themselves, as a ratio to all available people of working age. Occasionally

this ratio can trend up or down over an extended period, as it did gradually during the second half of the twentieth century as more and more women entered the labour force. But as with average hours worked per business sector job, there are limits to the percentage of the working-age population that can work. In the twenty-first century this driver is characterized mostly by short-term fluctuations, notably those associated with the business cycle.

Another component of the decomposition is the ratio of the working-age population to the permanent-resident population. The working-age population is defined here as the number of Canadian residents between 15 and 64 years of age as estimated in the Labour Force Survey. Until recently this large cohort had been declining significantly relative to the total permanent resident population due to the aging of the baby boom cohorts into the 65 and over age category which has much higher retirement rates than younger age groups. However, the huge increase in the NPR population in the last two years, consisting mostly of people of working age, has raised the numerator and reversed that trend for the time being.

The next factor influencing GDP per capita is the ratio of the permanent resident population (citizens and immigrants) to the total population. This ratio had been very high and trending down only mildly for many years, but starting around

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9 It could be argued that a better formulation would be the number of business sector jobs expressed as a ratio to the total population, since some of those 65 and over are also employed. However relatively few seniors are employed — just 14.5 per cent in May 2024 using seasonally adjusted Labour Force Survey statistics — and of those who are employed, 45 per cent worked in part-time jobs. Identifying the impact of aging of the baby boom cohorts into retirement age, which has the effect of reducing the working-age population (15-64 years of age as conventionally defined) is an important objective here so this alternative approach is not taken.

2016 and especially after 2021 it has been decreasing more rapidly. (This, of course, is the counterpart to the rise in the NPR share seen in Chart 4). The drop in this ratio has an important impact on GDP per capita because as noted previously there are strong reasons to believe the average real GDP associated with a typical PR is considerably greater than that of a typical NPR. [10]

Finally, the remaining driver of GDP per capita in this decomposition is the ratio of all-economy GDP to business-sector GDP. The gap between the two consists of three parts: government sector value added, non-profit sector value added and imputed rents on owner-occupied dwellings.[11] While, as alluded to earlier, these are excluded from the productivity concept considered in this analysis, they nevertheless are included in total GDP which, after dividing by the total population, is the variable that is in focus in this article.

To the extent these non-business-sector elements are growing more or less rapidly than business sector GDP, total GDP per capita will also tend to grow at a higher or lower rate compared to the business sector than would otherwise be the case. For example, all of these non-business-sector components except for non-profit institutions kept growing during the recession of 2008-2009 while business sector output de-creased and was slow to recover in 2009 and 2010. Thus, the ratio of total to business-sector GDP increased in late 2008 and early 2009. It remained fairly stable around this higher level until the pandemic struck in 2020. After the extreme volatility in the first half of 2020, the ratio moved again to a higher level. In the four years period between March 2020 and March 2024, total real GDP rose 13.2 per cent, business sector GDP 12.6 per cent, public administration GDP 14.5 per cent, health and social welfare GDP 18.5 per cent, education GDP 16.8 per cent, non-profit institutions GDP 15.7 per cent and imputed rent 10.3 per cent. In other words, one might say that the growth of total real GDP per capita has been somewhat 'propped up' since the pandemic began with disproportionately strong growth in the non-business sector.

Statistical Results

The decomposition analysis described above shows that the six investigated variables have followed different paths over time (Chart 6). The vertical axis scale is the same on all six charts and it is the slope of each line that indicates how large its effect is on GDP per capita, in both the short and the longer-term. Labour productivity's relative change (Percentage change)

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10 A full general equilibrium analysis would be very useful here, with a well-specified model, estimated parameters and a good statistical portrait of the types of work done by NPRs and their remuneration. This is however beyond the scope of this article and in any case would probably not be feasible given the limited available data.

11 Imputed rents on owner-occupied dwellings are included in the GDP concept, by all countries, mainly so there will not be swings in GDP due simply to shifts in household preference with regard to housing ownership/rental. If I rent my house to you while you rent yours to me there will be no change in GDP compared to the case where we just live in our own houses.

Chart 6: GDP per Capita Decomposition Components, Quarterly Indexes with 2017 = 1, 1997 Q1 to 2024 Q1, Seasonally Adjusted
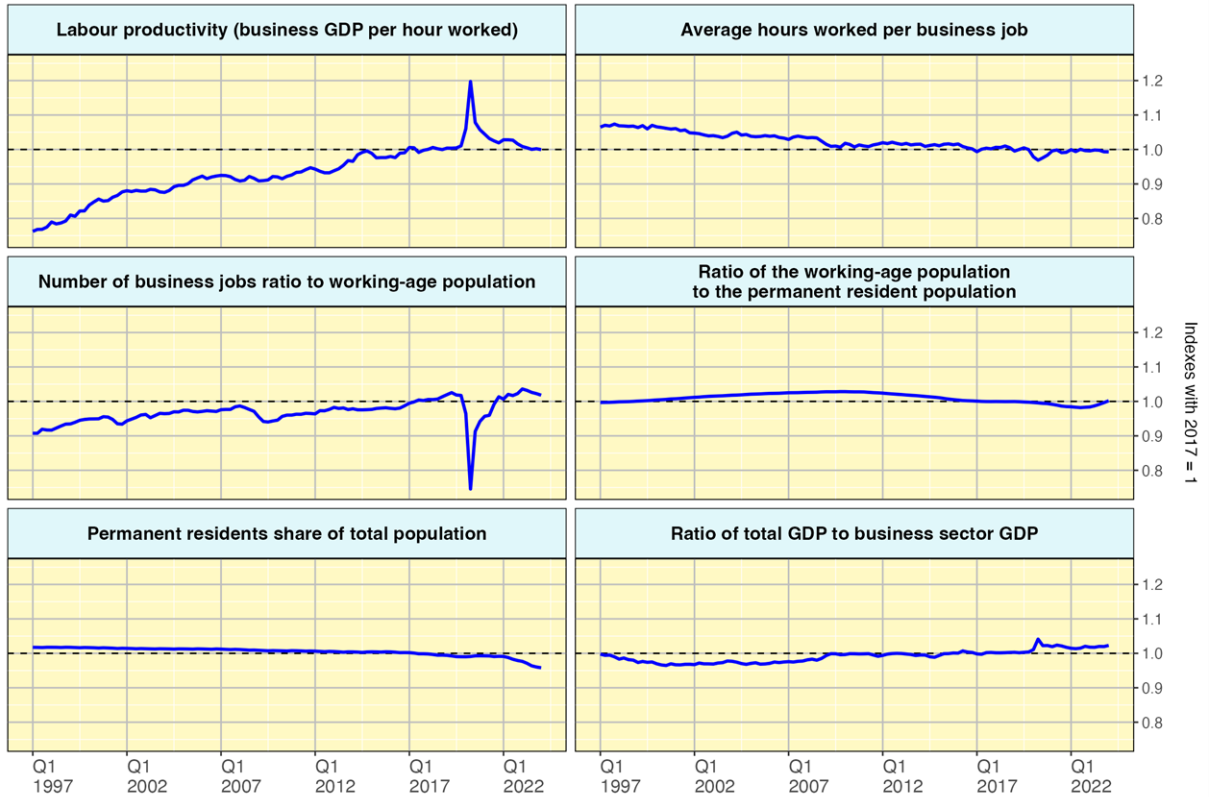
Source: Statistics Canada vectors v1, v29850346, v65201210, v1409154, v21580997, v1409155, v1409156
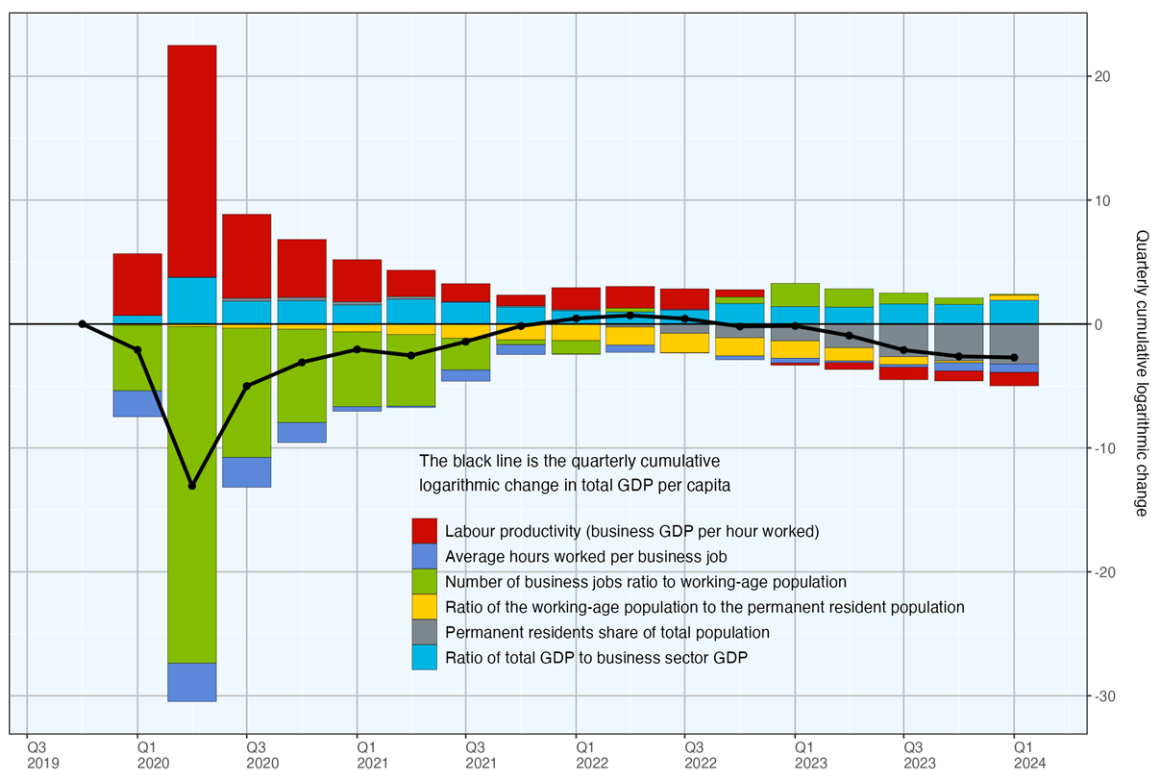
over the 26-year period has been much greater than the others and it is clearly the main driver of GDP per capita in the long run. It has been on a decline for the last few years though, and has hardly changed at all, on a net basis, since 2017.[12]

Average hours worked per job have been on a gradual trend decline over the full period, though they have been fairly stable in the years following the pandemic. The number of business sector jobs relative

to the total working-age population (15-64) (the employment rate) plunged when the pandemic began but recovered quite quickly thereafter and is now past its previous peak. The ratio of the working-age population to the permanent resident population started trending down around 2010 and continued doing so until 2022 when the surge of NPRs, the majority of whom are of working age, began. The number of permanent residents expressed as a ratio to the

Chart 7: GDP per Capita and Its Determinants, Quarterly Cumulative Logarithmic Change, 2019 Q1 to 2024 Q1, Seasonally Adjusted

The black line is the quarterly cumulative logarithmic change in total GDP per capita

- ■ Labour productivity (business GDP per hour worked)
- ■ Average hours worked per business job
- ■ Number of business jobs ratio to working-age population
- ■ Ratio of the working-age population to the permanent resident population
- ■ Permanent residents share of total population
- ■ Ratio of total GDP to business sector GDP

Source: Statistics Canada vectors v1, v29850346, v65201210, v1409154, v21580997, v1409155, v1409156

total population had been trending down gradually until recently. The numbers for 2022 and 2023 show a much sharper drop, due to the recent jump in the number of NPRs. Finally, since non-business sector economic activity has been growing more rapidly than business activity in the years since the pandemic, the ratio of total to business sector real GDP has increased.

Tracking the Drivers of Real GDP per Capita

The cumulative change in the real-GDP-to-population ratio since the fourth quarter of 2019 followed a down, up and then down again path over the last four years. Chart 7 decomposes these changes into our factors of interest and the statistics shown in the figure are reported in the appendix.[13]

GDP per capita (the black line) plummeted in the first half of 2020 when the economy was 'locked down' to limit the virus spread. Thereafter it began a gradual rebound as various steps were taken to limit that spread. The early 2020 drop and the

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13 In Chart 7, starting from the 4th quarter of 2019, some of the following quarters show increases and others decreases. This chart does not show those increases and decreases directly (although it could be drawn that way as an alternative). Rather, for each quarter the chart shows the cumulative sum of all the changes, positive and negative, up to that particular quarter. It shows, for example, that in 2021 Q4 GDP per capita was finally back to the point where it was in 2019 Q4, and it shows this was due to the fact that increases in labour productivity and the ratio of total GDP to business GDP (relative to 2019 Q4) fully offset the continued cumulative decline in the other four components (again, relative to 2019 Q4).

next few recovery quarters were almost entirely accounted for by changes in the employment rate (the green bars - the number of business sector jobs ratio to working-age population) and average hours worked per business sector job (dark blue). Labour productivity (red) jumped initially and this change was almost all due to temporary compositional changes rather than innovations in the production process. Businesses laid off or reduced the working hours of their less-skilled, lower-wage employees while 'hoarding' their more highly-qualified and difficult-to-replace staff in anticipation that the pandemic disruption would be temporary.

In addition, the pandemic affected disproportionately the public-facing industries such as food services and accommodation where lower-skilled jobs tend to be predominant. Since the denominator of the labour productivity ratio does not distinguish how skilled and experienced the employed people are, on average, measured productivity increases simply by having a lower number of low-skilled workers. In effect, the productivity boost can be attributed to the temporary rise in average labour quality. In the subsequent quarters the cumulative change in labour productivity fell back down as economic activity recovered and businesses re-employed lower-skilled employees. During these pandemic quarters the ratio of total to business-sector GDP increased and the remaining identified drivers had little impact.

By mid-2022 the economy was booming and GDP per capita had risen slightly above its pre-pandemic level. The main reasons were that by this time, the cumulative change in the employment rate had turned positive and that of labour productivity remained positive. However, by then the baby-boomer retirement phase-in was well under way, [14] serving to reduce the working-age share of the PR workforce (yellow bars) and offsetting some of the impact of the higher employment rate and productivity improvement (Statistics Canada, 2022).

The most recent few quarters, however, reveal the current weaker picture. The pandemic is largely in the past, but the cumulative change in GDP per capita has been moving down, slowly at first and then more rapidly, although the path levelled out in the most recent quarter. The employment rate and the total-economy-to-business-sector GDP ratio are continuing to make positive contributions, but the falling PR share of the population (equivalently the rising share of the NPR population) has become the largest downward driver of GDP per capita. As was discussed earlier in the article, there are strong reasons to believe the average productivity of NPRs, given the low-wage jobs most are working in, is much lower than that of the PR population. Their productivity contribution is lower and their weight in the overall population has been rising sharply, both factors contributing to declining overall Canadian GDP per capita. Decreasing labour productivity, the falling working-age

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14 The postwar baby boom peaked in the mid 1950s after which birth rates began a gradual decline. Babies born in the late 1940s and 1950s, now adults, have been retiring since around 2010 and the numbers that are doing so have been increasing.

share of the population and declining average hours worked are additional negative factors.

Summing up: Why GDP per Capita is Dropping

Canada has recently experienced a number of quarters of shrinking real GDP per capita. If it occurred during a recession, one would attribute the fall to a shrinking economy. But the economy is not in recession. Real GDP growth remains positive and unemployment is still low, although rising. The drop in GDP per capita is, rather, accounted for by:

- the diminishing share of the most experienced labour force cohort due to ongoing baby-boomer retirements;
- decreasing labour productivity, a complex and high-priority longer-term problem with no simple or immediate solution in sight, although in the short term it is related to the next driver; and
- a burgeoning NPR population, a factor for which relatively quick fixes are fortunately available, but which require difficult political decisions and imply a short-term dampening effect on GDP growth.

Conclusion

Canada's real GDP per capita is on a downward track and this should be a matter of concern for all Canadians. GDP continues to grow at well below its long-term potential rate because productivity is flagging. Canada's population is rising too rapidly, beyond the economy's annual absorptive capacity, and its PR-NPR mix is greatly distorted. The problem is compounded by the fact that Canada's most experienced workers, its seniors, are reaching normal retirement age at a more rapid rate as the baby boom generation enters old age, although this factor is mitigated by a rising median retirement age.

The immediate cause of this situation is the stunning increase in NPRs that came in 2022 and 2023. It was quite unexpected and has upset the forecasts and planning of policymakers at many levels. Although the spurt of NPRs did provide a kind of demand stimulus to GDP that helped avoid even weaker growth in 2023, the stimulus was small because the productivity and associated incomes of the jobs NPRs are filling are quite low. Part of the problem is that the filling of these jobs by additional NPRs has disincentivized business investment and thereby reduced Canada's overall labour productivity growth. The large influx of temporary foreign workers to fill low-wage jobs also served to limit Canada's unskilled PRs from realizing the opportunities and income benefits that would normally have come during the strong economic conditions of 2022, additional income that would have helped sustain consumer spending in 2023.

The government should set annual population growth targets, explain why those specific targets were chosen and use the various tools at its disposal to hit the targets. Recent statements by federal ministers indicate significant movement in this direction. Explicit landed immigration targets have been announced and largely implemented in this way for many years. Now an explicit three-year target for NPRs has also been set for the first time. This practice should continue at least until the ac-

knowledged excessive proportion of NPRs in the population has been reduced below the announced five per cent target. Further, the ways in which these targets are achieved also matters. Most importantly, an accompanying goal should be to upgrade the average knowledge, skills and experience of Canada's labour force as these targets are pursued. This implies minimal transitions of low-skilled NPRs to PR status and greater inflows of highly-skilled immigrants. This is a key part of the solution to Canada's chronic productivity challenge.

While the government's NPR reduction plan will have a short-term dampening effect on GDP growth and will cause financial problems for schools and businesses that had quickly become accustomed to the benefits accruing to them from the NPR surge, the policy changes that made this sudden bonanza possible were ill-advised, if well-intentioned, and must be reversed.

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Table A1: GDP per Capita and its Determinants, Quarterly Cumulative Log change, 2019Q4-2024Q1

Date	GDP per capita	Labour prod. (business GDP per hour worked)	Average hours worked per business job	Number of business jobs to working-age population	Ratio of the working-age population to the permanent resident population	Permanent residents share of total population	Ratio of total GDP business sector GDP
2019 Q4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020 Q1	-2.09	4.99	-2.11	-5.27	-0.1	-0.01	0.69
2020 Q2	-13.07	18.69	-3.1	-27.17	-0.20	0.06	3.74
2020 Q3	-5.01	6.78	-2.40	-10.43	-0.34	0.24	1.84
2020 Q4	-3.09	4.68	-1.61	-7.54	-0.41	0.27	1.88
2021 Q1	-2.05	3.41	-0.38	-6.04	-0.62	0.24	1.55
2021 Q2	-2.54	2.13	-0.12	-5.77	-0.85	0.22	2.00
2021 Q3	-1.42	1.45	-0.90	-2.57	-1.13	0.04	1.76
2021 Q4	-0.16	0.87	-0.79	-0.39	-1.28	0.11	1.36
2022 Q1	0.45	1.76	-0.03	-1.08	-1.33	0.08	1.08
2022 Q2	0.70	1.76	-0.59	0.31	-1.46	-0.24	0.97
2022 Q3	0.43	1.66	0.07	-0.03	-1.56	-0.75	1.11
2022 Q4	-0.19	0.59	-0.31	0.53	-1.46	-1.11	1.65
2023 Q1	-0.15	-0.19	-0.39	1.88	-1.38	-1.37	1.40
2023 Q2	-0.93	-0.56	-0.13	1.47	-1.05	-1.92	1.37
2023 Q3	-2.10	-1.02	-0.20	0.88	-0.62	-2.65	1.62
2023 Q4	-2.61	-0.83	-0.65	0.53	-0.12	-3.00	1.58
2024 Q1	-2.70	-1.10	-0.67	0.08	0.49	-3.29	1.91