Brown's Economic Damages Newsletter

September 2020 Volume Seventeen Issue 5

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Shut-down of the Canadian economy: impact of COVID-19 on productivity (Part 3)

By Cara L. Brown, M.A.*

In Part 2 of this series of articles, we focused on the disproportionate economic impacts by industry sector in Canada from COVID. In this issue (Part 3), we discuss the impact of the shut-down from COVID on the "engine of growth" for the economy: productivity. We also update Table 1 (confirmed COVID-19 cases and deaths across Canada)[1] as of **Sept. 30, 2020.**

COVID-related topics in other issues of
Brown's Economic Damages Newsletter:

- Preliminary economic effects of COVID-19 in Canada, and implications for quantum experts (Part 1) – disseminated June 15, 2020
- Economic effect of COVID-19 in Canada: Disproportionate effects on industry sectors (Part 2) - distributed Aug. 4, 2020
- Evaluating efficacy of government COVID-19 subsidies and programs
- Measuring the "benefits" related to COVID "costs": the *Value of a Statistical Life (VSL)* methodology

* Appreciation is extended to Ha Nguyen, M.A, for research assistance.

[1] In **Brown's Economic Damages Newsletter** entitled "Economic effect of COVID-19 in Canada: Disproportionate effects on industry sectors (Part 2)", we provided a summary of confirmed cases and deaths for each province and territory as of July 30, 2020 (p. 3).

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Confirmed cases & deaths from COVID-19 in Canada as of September 30, 2020

In Table 1 below, we update previous statistics on COVID-induced confirmed cases and deaths as of Sept. 30, 2020. Interestingly, the "rate of death" from these confirmed cases has increased little: on June 11, 2020, the "rate of death" across Canada equaled 21 per 100,000 persons.[2] As of Sept. 30, 2020, this statistic equaled 25 per 100,000 persons.

Table 1: Compilation of COVID-19 confirmed cases & deaths, by province and territory in Canada (September 30, 2020)

Canada/Province and Population	Confirmed cases	Deaths
Canada (38 million)	158,758	9,297
Alberta (4.4 million)	18,062	267
British Columbia (5.1 million)	9,138	234
Manitoba (1.4 million)	1,993	20
New Brunswick (0.8 million)	200	2
Newfoundland and Labrador (0.5 million)	274	3
Northwest Territories (0.04 million)	5	0
Nova Scotia (1.0 million)	1,088	65
Nunavut (0.04 million)	0	0
Ontario (14.7 million)	51,710	2,848
Prince Edward Island (0.1 million)	59	0
Quebec (8.5 million)	74,288	5,834
Saskatchewan (1.2 million)	1,913	24
Yukon (0.04 million)	15	0

Source: Government of Canada. *Coronavirus disease (COVID-19): Outbreak update* . Accessed at: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html on October 1, 2020; and Statistics Canada. Table 17-10-0009-01 *Population estimates, quarterly.*

- From July 30 to Sept. 30, 2020, total cases across Canada increased by almost 43,000, but deaths increased by less than 400 (9,297 versus 8,929)
- The number of confirmed cases in Alberta increased by 69% (from 10,716 to 18,062) but the number of deaths increased by only 72 (from 195 to 267)
- Similarly, the number of confirmed cases in BC increased almost three-fold (from 3,591 to 9,138) but the number of deaths increased by only 40 (from 194 to 234)

[2] **Brown's Economic Damages Newsletter** "Preliminary economic effects of COVID-19 in Canada, and implications for quantum experts (Part 1)", June 2020, vol. 17, issue 3 (p. 9).

- As was the case in June of 2020, Ontario and Quebec account for the large majority of confirmed cases (79% of all cases in Canada) and account for an even larger share of deaths (93%)
- Confirmed cases in Quebec and Ontario increased by 26% and 32%, respectively, but the number of deaths increased by only 3% in each province
- Saskatchewan's number of confirmed cases increased by 46%, but the total number of deaths in that province only increased from 18 to 24 from July 30 to Sept. 30, 2020
- The number of confirmed cases in each of the four Atlantic provinces increased marginally, but all Atlantic provinces were able to stop the number of deaths from increasing – only in Nova Scotia did the count for deaths increase (from 64 to 65)

What's wrong with this picture: when COVID shutdown the economy, productivity was given a boost (?)

What is productivity?[3]

Productivity is commonly defined as the ratio between the **output** volume (*Gross Domestic Product*, referred to as GDP[4]) and the **input** volume in the economy (labour from workers and the use of capital[5]). Put a simpler way, "productivity is defined as the average income or output generated in an hour of work in the economy."[6]

When we produce a higher level of "output" (GDP) in the economy with the same or fewer "inputs" (labour and capital), the result is a *growth* in productivity.

Increases in productivity result in enhancements to workers' standard of living in these ways:[7]

1) Increases salaries;
2) Allows businesses to contain costs, which enables them to stay profitable and competitive;
3) Lowers consumer prices, thereby increasing purchasing power;
4) Expands the choice of consumer goods available to purchasers;
5) Provides the base for investment in government policy (for education, health, infrastructure, poverty reduction, social security and environmental improvement); and
6) It is a key determinant of international competitiveness.

This is why productivity is often referred to as the "engine of growth" for the economy.

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[3] An expanded discussion of this economic concept was covered in **Brown's Economic Damages Newsletter,** "The Productivity Rate: What is it, and how is it determined?" February 2012, vol. 9, issue 1.
[4] *Gross Domestic Product* (GDP), as defined by Statistics Canada, is "the unduplicated value of goods and services produced during a period that is available for final domestic consumption, investment or export". Statistics Canada's *National Economic Accounts* record the value of GDP from two perspectives, as income arising from production and as final expenditure on goods and services produced. In real terms (that is, adjusted for price change), GDP is representative of the volume of economic activity in a given period. (Source: Statistics Canada. *National Gross Domestic Product (GDP) by Income and by Expenditure Accounts*).
[5] Capital inputs include land, building, factories and machinery; technological processes; achievement of economies of scale; research and development. Source: Baldwin, J. R., T. Harchaoui, J. Hosein and J. Maynard, "Productivity: Concepts and Trends", *Productivity Growth in Canada* (Minister of Industry: Statistics Canada), catalogue no. 15-204-XIE, 2001.
[6] J. Bivens. *A 'high-pressure economy' can help boost productivity and provide even more 'room to run' for the recovery*. Economic Policy Institute, March 12, 2017.
[7] Baldwin, J. R., T. Harchaoui, J. Hosein and J. Maynard. "Productivity: Concepts and Trends", *Productivity Growth in Canada* (Minister of Industry: Statistics Canada), catalogue no. 15-204-XIE, 2001, p. 13; Gu, W., M. Kaci, J. Maynard and M. Sillamaa, "The Changing Composition of the Canadian Workforce and its Impact on Productivity Growth", *Productivity Growth in Canada* (Minister of Industry: Statistics Canada), catalogue no. 15-204-XIE, 2002, p. 67; OECD, *Measuring Productivity Measurement of Aggregate and Industry-Level Productivity Growth OECD Manual,* 2001, p. 11; Tang, J. and W. Wang, "Sources of aggregate labour productivity growth in Canada and the United States" *Canadian Journal of Economics* May 2004 Vol. 37, No. 2, p. 422; Bank of Canada. *Productivity*. Backgrounders, 2012.

There are two main concepts tracked by economists for measuring productivity:

1) Labour productivity (GDP per hour worked)[8] – **most common metric reported**
2) Real annual wage growth per employee (difference in wages[9] versus prices[10])

In analyzing the trend in labour productivity and real hourly labour compensation over the last 50 years from 1961 to 2012, Baldwin *et al.* (2014) found that most of the increase in labour productivity translated into an increase in real hourly labour compensation.[11]

Measuring the impact on productivity of the COVID shutdown

Using the ratio of "GDP per hour worked" to ascertain how the COVID crisis affected Canada's economy yields a startling result, because although GDP declined (massively), the hours worked by employees in Canada – in aggregate – decreased to a greater extent.[12] As a result, *labour productivity in the Canadian economy rose 9.8%*, the largest quarterly increase recorded since 1981.[13]

Measurement problems associated with counting service sector productivity

The service sector employs 79% of all workers in Canada, compared to goods-producing industries.[14] This is echoed in the contribution to GDP:[15] the service sector generates 71% of Canada's GDP. As noted by the Bank of Canada, "… services will continue to play an important role in increasing potential output and supporting rising real wages" and "rates of growth vary greatly across service industries".[16]

Unlike goods-producing industries, whose output is typically visible and quantifiable, the outputs produced in service jobs are often unobserved and prone to measurement difficulties. Aggregate productivity growth in the services sector has generally lagged behind that of the goods sector.[17] This is because an increase in productivity in the services sector typically results in an improvement in quality rather than quantity.[18] This type of measurement error (and other measurement problems) is not captured when counting GDP.[19]

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[8] A. Murray. "Partial versus Total Factor Productivity Measures: An Assessment of their Strengths and Weaknesses," *International Productivity Monitor*, Centre for the Study of Living Standards, vol. 31, pp. 113-126, Fall 2016; J. R. Baldwin, W. Gu, R. Macdonald and B. Yan. *Productivity: What Is It? How Is It Measured? What Has Canada's Performance Been Over the Period 1961 to 2012?*. Statistics Canada Catalogue No. 15-206-X, September 15, 2014; and H. Schneider. *Surprising surge: Productivity during the Covid-19 crisis*. Geopolitical Intelligence Services, July 3, 2020.
[9] Tracked by Statistics Canada's *Survey of Employment, Payroll and Hours* (SEPH) database, which is disaggregated by province/territory and industry sector.
[10] Measured by Statistics Canada's *Consumer Price Index* (CPI).
[11] "Productivity growth is closely related to growth in our standards of living … real hourly labour compensation and labour productivity are closely related in the long run. Most of the increase in productivity was passed through to an increase in real hourly labour compensation." Source: J. R. Baldwin, W. Gu, R. Macdonald and B. Yan. *Productivity: What Is It? How Is It Measured? What Has Canada's Performance Been Over the Period 1961 to 2012?*. Statistics Canada Catalogue No. 15-206-X, September 15, 2014.
[12] For the purpose of calculating "GDP per hour worked", aggregate hours across all workers are counted. When layoffs occurred from the shutdown induced by COVID, hours worked by the laid off employees fell to zero. This metric does not reflect average hours worked per week by the employees remaining in the workforce.
[13] Statistics Canada. *Labour productivity, hourly compensation and unit labour cost, second quarter 2020*. The Daily, September 2, 2020.
[14] Statistics Canada. Table 14-10-0023-01 - *Labour force characteristics by industry, annual (x 1,000).*
[15] Statistics Canada. Table 36-10-0434-03 - *Gross domestic product (GDP) at basic prices, by industry, annual average (x 1,000,000).* This table uses the "value-added" approach to counting GDP, where Statistics Canada first counts output by industry sector and then subtracts the goods and service used up in the process of generating that output.
[16] D. Maclean. *Lagging Productivity Growth in the Service Sector: Mismeasurement, Mismanagement or Misinformation?*. Bank of Canada, March 1997, pp. 28-29.
[17] D. Maclean. *Lagging Productivity Growth in the Service Sector: Mismeasurement, Mismanagement or Misinformation?*. Bank of Canada, March 1997.
[18] Galarneau, D. and C. Dumas, "About Productivity", *Perspectives in Labour and Income* (Ottawa, Ontario: Statistics Canada), 1993, 5(1).
[19] Many researchers have suggested that an important source of the differential in productivity growth between goods and services is measurement error. These problems include defining service-sector outputs and identifying price versus quality changes, as well as the paucity of data on services (source: D. Maclean. *Lagging Productivity Growth in the Service Sector: Mismeasurement, Mismanagement or Misinformation?*. Bank of Canada, March 1997, p. 10).

Productivity is lower in services-producing industries than in manufacturing industries due in part to their resistance to standardization. In personal and consumer services sectors such as accommodation and food services, amusement and recreation services and miscellaneous services, direct contacts between the consumer and the service provider (those who provide labour inputs) have remained important. Additionally, while finance, insurance and real estate, and communications are typically ranked as "high tech", trade, amusement and recreation, food and accommodation, and other personal services are considered low technology industries. These low-technology sectors rely mainly on unskilled workers, offer part-time and temporary forms of employment, and exhibit low levels of unionization.[20] All above-mentioned factors hinder automation, economies of scale and labour productivity, which in turn hamper productivity growth of these service sectors.[21]

In addition, the ratio of GDP per hour worked ignores the process whereby GDP is created from capital inputs, not just labour productivity.[22] In other words, this specific equation implicitly attributes any change in GDP to hours worked by employees, but ignores capital deepening and the impact of technological advances, which we know have a large impact on GDP. In fact, measurements of these components show that labour contributes the least to GDP when compared to capital deepening and technological advances.[23]

As Statistics Canada explains about how service sector jobs are "counted" as part of GDP:

> Government and non-profit services are generally not provided in exchange for market prices. According to international conventions, the final consumption expenditure of governments and non-profit institutions in nominal terms is *often estimated by the wage and material costs associated with their production.* The volume of their activity is estimated using actual hours worked for the wage component (emphasis added).[24]

The quote above is imperative in understanding the component of GDP accounted for by service-sector jobs. For Canada's system of macroeconomic accounts (which measures GDP), these jobs are *measured by the wages paid* to service-sector employees. So if we have a situation where service sector employees continue to be paid even though they were not working (as an example, see the section below on the use of code 699 by federal government employees shortly after the COVID crisis erupted), the reduction in output of these employees is not reflected in GDP. As a result, the equation for productivity (GDP/hours worked) from the COVID-induced shutdown is over-inflated in the numerator (GDP) and suggests higher productivity than is actually the case.[25]

[20] K. Weiermair. *The Labour Market and the Service Sector*. The Fraser Institute, 1988; A. M. Noack and L. F. Vosko. *Precarious Jobs in Ontario: Mapping Dimensions of Labour Market Insecurity by Workers' Social Location and Context*. Law Commission of Ontario, November 2011; and S. Sorbe, P. Gal, and V. Millot. *Can productivity still grow in service-based economies? Literature overview and preliminary evidence from OECD countries*. Organisation for Economic Co-operation and Development, December 14, 2018.
[21] K. Weiermair. *The Labour Market and the Service Sector*. The Fraser Institute, 1988; and S. Sorbe, P. Gal, and V. Millot. *Can productivity still grow in service-based economies? Literature overview and preliminary evidence from OECD countries*. Organisation for Economic Co-operation and Development, December 14, 2018.
[22] Henrique Schneider. *Surprising surge: Productivity during the Covid-19 crisis*. Geopolitical Intelligence Services, July 3, 2020.
[23] J. Bivens. *A 'high-pressure economy' can help boost productivity and provide even more 'room to run' for the recovery*. Economic Policy Institute, March 12, 2017.
[24] Statistics Canada. *Gross domestic product, income and expenditure first quarter 2020*. The Daily, May 29, 2020.
[25] This outcome is accentuated by the metric on the denominator (hours worked) since data on hours worked by salaried employees from Statistics Canada's *Survey on Employment, Payroll and Hours* (SEPH) shows that there was negligible change from February to June 2020 in virtually all industries. (Figures 2, 3, 4, and 5 below are for hourly-paid employees, not salaried workers.)

Impact of government COVID subsidies on counting GDP

In its latest report released in August 2020, the Department of Finance of the Government of Canada reports that the federal government has spent **$1 trillion** on various governmental programs and subsidies in response to the economic impact of COVID-19.[26] Many of these subsides are transfers from governments to households, non-profit institutions serving households, corporations, other Canadian governments or non-residents, and payment deferrals, which have no effect on GDP, as indicated by Statistics Canada.[27]

Even though the COVID subsidies "have no impact on GDP, in an accounting sense",[28] the government's massive spending in response to the impact of the COVID-19 pandemic will result in a federal deficit[29] of $343 billion for the 2020-21 fiscal year, about six times larger than the $56 billion deficit recorded during the financial crisis in 2009, and *surpassing the combined total of every deficit* between 2008 and 2019.[30] As a share of the economy, the national deficit in 2020-21 amounts to 15% of GDP, the largest on record since 1966.[31] Consensus Economics forecasts that Canada will place third-highest, behind the United States and the United Kingdom, for national deficit relative to economic size.[32]

The never-before-seen size of deficit anticipated for the 2020-21 fiscal year is expected to have a negative impact on productivity growth.[33]

Economic theories explaining the so-called "surge" in productivity during the COVID period

- The larger decline in hours worked for low-productivity sectors (for example, accommodation and food services and arts, entertainment and recreation) that reduced their relative shares in overall productivity growth, resulting in an upward compositional effect on productivity growth[34]
- Economies of scale: compared to small and medium businesses, large enterprises are more likely to survive the financial blowout caused by COVID-19, given their economies of scale.[35] In fact, 32% of the small businesses forced to close down during the mandatory lockdown might never reopen[36]
- The accelerated shift to digital technologies and services that allow telework which alleviates, to a lesser or greater extent, some of the disruptions caused by COVID-19[37]
- Less productive members of the labour force were the first to lose their jobs or asked to shift to part-time work, implying that remaining workers exhibited greater efficiency[38]

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[26] House of Commons of Canada, Department of Finance. Canada's COVID-19 Emergency Response: Bi-Weekly Report on Parts 3, 8, and 18 of Bill C-13, Tenth Report, August 6, 2020.
[27] Statistics Canada. *Recording COVID-19 measures in the national accounts*. Catalogue no. 13-605-X, May 29, 2020.
[28] Statistics Canada, *Recording COVID-19 measures in the national accounts,* released May 29, 2020 (p. 3).
[29] The government budget balance is calculated as the difference between a government's revenues (taxes and proceeds from asset sales) and its expenditures. It is often expressed as a ratio of *Gross Domestic Product* (GDP). If the balance is positive, the government has a surplus (it spends less than it receives). If the balance is negative, the government has a deficit (it spends more than it receives). A country's national debt is the accumulation of all the deficits, plus the interest on debt since Confederation. (Sources: FocusEconomics. *Fiscal Balance (% of GDP)*. Available at: (https://www.focus-economics.com/); and M. Gollom. *What voters need to know about deficits and the debt*. CBC News, October 3, 2019).
[30] Department of Finance Canada. *Economic and Fiscal Snapshot 2020*, July 2020; and Trevor Tombe. *Why Canada might need a temporary COVID-19 tax and repayment fund*. Maclean's, June 8, 2020.
[31] The Parliamentary Budget Officer. *Scenario Analysis Update: COVID-19 Pandemic and Oil Price Shocks*, June 18, 2020; and Global News. *Canada's deficit to hit $330B as coronavirus lands 'permanent' economic impact*. September 29, 2020.
[32] Consensus Economics. *Consensus Forecasts - G7 and Western Europe Survey, June 2020.*
[33] A. Dieppe. *Global Productivity – Trends, Drivers, and Policies*. The World Bank, 2020.
[34] Statistics Canada. *Labour productivity, hourly compensation and unit labour cost, first quarter 2020*. The Daily, June 3, 2020.
[35] Business sectors exclude public administration, health care, and education services.
[36] Canadian Federation of Independent Business. *One third of shuttered SMEs not confident they will ever reopen*, March 31, 2020.
[37] J. Glassman. *The COVID-19 Recovery May Cause Lasting Changes in Technology and Productivity*. J. P. Morgan, June 8, 2020.
[38] Henrique Schneider. *Surprising surge: Productivity during the Covid-19 crisis*. Geopolitical Intelligence Services, July 3, 2020.

Yet the consensus on the impact of digitization on productivity is mixed. Some economists argue that "low productivity is here to stay; recent investments in digitization push labor productivity down because they make capital the main driver of increasing productivity."[39] While many people lauded the shift to using Zoom or Skype to replace on-site meetings, others commented that workers' productivity during COVID "only materialize[s] if employees can frequently check in at an office in order to solve problems" and that spontaneity and planning new projects is difficult in this framework. Added to these downsides are the constant precautions that have become part of daily life: "When mental capacity is taken up by worries about whether or not to touch that door handle or whether or not to believe the results of the latest study on the virus, focusing is difficult."[40]

In June of 2020, the *Canadian Women Economists' Committee* (CWEC) surveyed 267 Canadian economists (172 men and 95 women) on the impact of the COVID-19 pandemic on their productivity. About 41 to 65% of the economists surveyed responded that "increased teaching time", "lack of face-to-face with colleagues", "cancellations of conferences", "stress/mental health", "household responsibilities", and "childcare/homeschooling" negatively impacted their productivity and that "childcare/homeschooling" is the most important barrier to their productivity. With respect to the most important benefit to productivity of remote work, the economists' most common response was "lower commuting time".[41]

Statistics Canada's *Labour Force Survey* reported that 36% of parents with children under 18 years old and 56% of parents with at least one child under six years old, who starting working from home due to COVID-19, are concerned that returning to their usual work location would involve challenges related to childcare because business re-openings in most provinces occurred at a different time than resumption of at-school attendance.[42]

Economic theories as to why productivity actually "slumped" due to COVID

Despite the mathematical outcome that suggests productivity increased, in point of fact most economic indicators demonstrated that economic activity *declined* during the COVID shutdown as demonstrated by lower GDP (output), price deflation, higher unemployment rates,[43] and fewer hours of work (see the section below entitled "Data on hours of work from Statistics Canada's SEPH database"). As I observed in Part 2 of this series, a few industries flourished during this time if they were essential services (health care, PPE manufacturing, finance, real estate and banking) but most were negatively affected. Other writers have summarized the downward impact of COVID-19 on productivity:

- *Weaker investment and trade*: Investment and trade play important roles in promoting productivity growth. As governments work to avoid a reintroduction of the coronavirus and new outbreaks, containment measures such as export restrictions introduced by several countries disrupt global supply chains.[44] Uncertainty about the duration of the pandemic and the global economic landscape that emerges from it may discourage investment.[45] Canada already lags behind the US in terms of productivity growth because our country has little in the way of business sector investment and R&D, and we struggle to get exports to market.

[39] Henrique Schneider. *Surprising surge: Productivity during the Covid-19 crisis*. Geopolitical Intelligence Services, July 3, 2020.
[40] The Economist. *The 90% economy that lockdowns will leave behind*, April 30, 2020.
[41] Canadian Women Economists Committee. *Results of the CWEC/CWEC Survey of Canadian Economists on the Impact of the COVID-19 Pandemic on Productivity*. Accessed at https://www.economics.ca/cpages/cwec-covid-19-survey on August 28, 2020.
[42] Statistics Canada. *Labour Force Survey, July 2020*. The Daily, August 7, 2020.
[43] For a summary of unemployment rates and price changes for the month of August 2020, see page 22 of this newsletter issue.
[44] The Conference Board of Canada. *COVID-19 Global Supply Chain Disruptions*, April 27, 2020.
[45] A. Dieppe. *Global Productivity – Trends, Drivers, and Policies*. The World Bank, 2020; and N. Bloom. *Fluctuations in Uncertainty*. Journal of Economic Perspectives, Vol. 28, No. 2, Spring 2014, pp. 153–176.

- *Erosion of human capital and shifts in labour market*: Education remains a key driver of productivity growth. Steep income losses and disruptions to schooling could increase dropout rates and decrease investments in human capital. The World Bank Group's *2020 Human Capital Index*[46] reports that more than 1 billion persons have been out of school and could lose half a year of schooling due to the impact of the pandemic. Additionally, job detachments and persistent unemployment may cause workers to lose skills and erode human capital.[47]

- *Heavy debt burden*: Productivity is highly vulnerable to financial stress, especially when accompanied by a rapid build-up of debt. With respect to household debts, Statistics Canada reports that debt-to-disposable income ratios[48] increased to 175% in the first three months of 2020, which means that Canadian households owe $1.75 for every dollar they earn in income. The rapid build-up of debt may increase vulnerabilities to financial crises, constrain the government's supports for economic recovery through fiscal and monetary policies, and hamper productivity growth, as advised by the World Bank.[49]

It is hard to argue that just because one economic indicator (hours worked) decreased by more than another (GDP) that this reflects greater productivity on the part of workers. It is more accurate to state that both of these factors were hard-hit by the COVID shutdown, but one was affected to a worse degree than the other.

Next, we discuss the "hours of work" metric and the impact on this variable during the COVID-induced shutdown.

Shirking: what happens when there is no oversight?

There have been some suggestion that workers' ability to "adapt their hours worked to the amount of work they had" and the "reengineering of work processes, more communication and improved management" contributed to the increase in productivity.[50] But these observations are extremely difficult to measure and prove.

For instance, "adapting one's hours of work" to meet job demands is only relevant for people who approach work with a ***task-based*** focus rather than a ***time-based*** focus, and these workers are in the minority. Excepting professionals who are paid according to a "billable hours" or piece-work basis, the self-employed, and individuals with strong labour force attachment, most employees start and end work at regular intervals regardless of what tasks need to be completed – a time-based focus. Adopting a task-based focus requires a commitment to a standard of excellence that trumps the hours required to finish the task. It is more about "getting the work done well" irrespective of hours spent than "getting through the day".

Shirking occurs when workers engage in tasks other than work while working or when workers do not exert effort to complete a given quota.[51]

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[46] The World Bank Group's *2020 Human Capital Index* reports the Human Capital Index (HCI) that measures the human capital that a child born today can expect to attain by her 18th birthday, given the risks of poor health and poor education prevailing in her country. The 2020 update provides HCI scores for 174 countries including Canada. (Source: The World Bank Group. (2020). *The Human Capital Index 2020 Update: Human Capital in the Time of COVID-19*).

[47] There may be prospects for productivity gains for workers who have had to upgrade their IT skills to shift to remote workplaces. (Source: F. di Mauro, and C. Syverson. *The COVID crisis and productivity growth*. Vox CERP Policy Portal, April 16, 2020).

[48] In Canada, household disposable income is defined, as recommended by the international standard, as the sum of all incomes received by households residing in Canada, where earnings include compensation of employees, net mixed income, and net property income. (Source: Statistics Canada. *Reconciling Canadian-U.S. measures of household disposable income and household debt*. Catalogue 13-605-X. Minister of Industry, 2015).

[49] A. Dieppe. *Global Productivity – Trends, Drivers, and Policies*. The World Bank, 2020.

[50] Henrique Schneider. *Surprising surge: Productivity during the Covid-19 crisis*. Geopolitical Intelligence Services, July 3, 2020.

[51] Daniel S. Hamermesh. *Shirking or Productive Schmoozing: Wages and the Allocation of Time at Work*. National Bureau Of Economic Research, December 1988; and Russell Engel. *Why Work When You Can Shirk?: Worker Productivity in an Experimental Setting*. Journal of Applied Business and Economics, Vol. 11 (2), 2010.

In a study entitled "Why Work When You Can Shirk?: Worker Productivity in an Experimental Setting", Russel Engel found that shirking behaviours have the potential to be extremely costly to firms in terms of productivity loss. The author reports that **when the monitoring level is zero, less than 17% of workers meet or exceed a given quota.** As the monitoring level increases, shirking behavior is more likely to be punished. To avoid this punishment, workers have to exert effort to meet performance expectations set by their employer. Engel shows that monitoring can curtail shirking behaviours.[52]

High wages can help reduce shirking when workers' effort is not perfectly observed, particularly with teleworking. Shapiro and Stiglitz,[53] who developed the well-known Shapiro-Stiglitz efficiency-wage model that plays an important role in employment theory, found that workers with wages above market-clearing levels, the wages at which the supply of labour is equal to the demand for labour,[54] will work at an effort level which involves no shirking as high wages raise the value of unemployment and increase workers' fear of job loss due to shirking.

Telework implies giving up some control over workers that might provide workers with more opportunities to shirk their job responsibilities, as argued by the *Organization for Economic Co-operation and Development* (OECD). To explain this, the OECD states that "as control over workers is often exerted through face-to-face interactions and physical presence, telework can hinder managerial oversight and aggravate principal-agent problems such as shirking".[55]

The opposite of shirking: who does the right thing when no one is looking?

The "right thing" in this context pertains to fulfilling hours of work that one is contracted to do in exchange for compensation.

From observing behaviors of 182 student-subjects participating in a real-task laboratory experiment, Dickinson and Villeval found that only 25% of the participants performed at the desired output level or even above this level when they were not monitored due to their interests in their tasks, integrity or commitment to moral principles.[56]

Nagin et al.'s study indicated that the employees who responded quickly to reductions in monitoring (by quickly and sharply increasing the rate at which they engage in malfeasance) tended to be those who perceived the employer as being unfair and uncaring.[57]

Using regression analysis on data from the Center for Survey Research and Analysis' (CSRA) national telephone survey in 2000, Minkler found that moral motivation is the most important reason explaining why workers fulfill agreements to work hard.[58] The author indicates that the result is consistent with findings from the literature on moral

[52] Russell Engel. *Why Work When You Can Shirk?: Worker Productivity in an Experimental Setting*. Journal of Applied Business and Economics, Vol. 11 (2), 2010.
[53] C. Shapiro and J. E. Stiglitz. *Equilibrium Unemployment as a Worker Discipline Device*. American Economic Review, Vol. 74, No. 3. (June 1984), pp. 433-444.
[54] Cornell University's *Market Clearing Wage and Efficiency Wage*. Accessed on October 1, 2020 at: blogs.cornell.edu/info2040/2015/10/20/market-clearing-wage-and-efficiency-wage/.
[55] Organisation for Economic Co-operation and Development. *Productivity gains from teleworking in the post COVID-19 era: How can public policies make it happen?*, September 7, 2020.
[56] Dickinson, D., Villeval, M.C. (2008). *Does Monitoring Decrease Work Effort? The Complementarity Between Agency and Crowding-Out Theories.* Games and Economic Behavior, 63, 56-76.
[57] Nagin, D. et al. (2002). *Monitoring, Motivation and Management: The Determinants of Opportunistic Behavior in a Field Experiment.* American Economic Review, 92 (4), pp. 850-73.
[58] Minkler, Lanse, (2004). *Shirking and Motivations in Firms: Survey Evidence on Worker Attitudes.* International Journal of Industrial Organization, *22*, pp. 863-84.

motivation[59] that suggests workers may work hard without supervision if they see doing so as a moral duty, and workers' efforts increase with increases in moral motivation. The author further indicates that the survey conducted by the CSRA showed that *of the workers who fulfilled their contracts without monitoring,* 83% stated that they are "very likely" to work hard even when they are not monitored by their employer because they think "it is the morally right thing to do". (This does not imply that 83% of workers possessed the requisite moral motivation to complete work without monitoring – only that of those who did the work without monitoring, 83% were motivated for moral reasons).

These findings imply that without oversight or monitoring, labour productivity is dependent on the worker's internal (unenforced) code of conduct. Conversely, if that code of conduct is missing, labour productivity cannot be achieved without strict employer oversight and monitoring. Shifting to workplaces that prohibit such oversight and monitoring implies *lower* productivity going forward, rather than a "surge" in productivity.

The "remote work" movement inspired by COVID

A recent survey completed by ADP Canada and Maru/Blue found that "45 percent of working Canadians surveyed say they would prefer to work remotely at least three days a week and more than ¼ would prefer to work flex hours". This survey also claimed that "remote work did not have a significant impact on productivity, quality of work and hours of work".[60] With respect, this survey response is likely influenced by "socialization" factors and other filters because it contradicts the consensus in the literature that less oversight and monitoring leads to *fewer* hours of work or *lower* productivity. Examples of "socialization factors" include:

- Workers may not admit to themselves that they work fewer hours when working remotely, particularly if they strongly prefer to continue working remotely and feel pressure to justify the change in workplace location;
- Pressure may exist to maintain the notion of efficiency when workers are witness to their colleagues' claims that they have become more productive working remotely;
- There is no upside for any survey respondent to concede that they are working fewer hours when there is less monitoring and oversight;
- Analysis of survey data suggests that recall of time-based data (such as hours of work) is influenced by how long the respondent "feels" the activity lasted. For instance, time assigned to undesirable tasks is often represented as taking more time than it actually did.

Most of us are aware that shifting workplaces to remote locations entails coping with many more distractions. Consider a quote from a CBC News article:

> "I'm pretty happy working from home, being able to squeeze in a workout, catch up with a friend or run an errand…in general, I just feel like I'm taking better care of myself. I'm eating more consistent meals…I feel like I'm focused more on my health and wellness because [I] have more control over that in [my] own space".

Although this interviewee was ostensibly talking about working from home, everything this interviewee described about remote work had to do with not working. A new trend in this direction will not boost labour productivity.

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[59] Dowell, R., R. Goldfarb, and W. Griffith. (1998). *Economic Man as a Moral Individual*, Economic Inquiry 36, 645-53; Minkler, L., and T. Miceli. (2004). *Lying, Integrity, and Cooperation*. *Review of Social Economy*, 62, 27-50; and Sen, A. (1978). *Rational Fools: A Critique of the Behavioral Foundations of Economic Theory*, in H. Haris, Ed., Scientific Models and Men (London: Oxford University Press).

[60] ADP Canada. "The Future of Work is Flexible: ADP Canada Study." Sept. 2, 2020; CBC News, "Office work could be changed forever by COVID-19. Here's why that matters" Sept. 7, 2020.

The shift to home-based work during COVID-19 has been glamourized in the media and fueled the debate about where workers would *rather* work: the office or at home. In fact, when they released the results of their survey, ADP Canada phrased this debate as follows: "…employers have an opportunity to embrace flexible work options beyond the pandemic." Interestingly, ADP Canada described this as an "opportunity" as opposed to the reality that this is an added obligation with extra costs that did not exist prior to COVID and may not be recouped. Additionally, employers who already pay for space no longer utilized at the workplace face redundant fixed costs.

What is missing in this debate is that employers have the right to compel workers to return to the workplace if that was their place of work before COVID – without justification or explanation. Alleging that the employer's workplace is unsafe (from COVID) has been attempted but in "virtually every jurisdiction in Canada, inspectors have ruled workplaces safe in almost every case", which means this excuse is not accepted. Nor can employees refuse to return to work because they are older or believe they bear a special risk because of their or their family's health circumstances and degree of auto-immune vulnerability.[61]

Of course, this only pertains to the share of organizations where remote work is possible. Jobs that require interpersonal interaction or on-site personnel do not have the choice of altering their "workplace" location, such as occupations in sales and service which require face-to-face interactions. Statistics Canada's publication entitled *Canadian Perspectives Survey Series 1: Impacts of COVID-19* indicated that those who were able to initially switch to home-based work were much more likely to have a Bachelor's degree (or higher) than those who continued to work outside the home and those who were absent from work.[62] We address the "rise of telework" in the next section.

The rise of telework

The lockdown prevented Canadians from working as they normally would. Statistics Canada's *Labour Force Survey* reports that approximately 4.7 million Canadians who do not usually work from home did so during the week of March 22 to 28 and by June 2020, approximately 35% of working Canadians expects to continue working from home if or when possible.[63]

The possibility of working remotely is not available to everyone. Overall, less than 40% of Canadians are in jobs that can be done from home, as reported by Deng and his co-authors.[64] High-income earners are more likely than low-income earners to hold jobs that can be done from home.[65] Figure 1 compares the percentage capacity for telework by industry sector in Canada.

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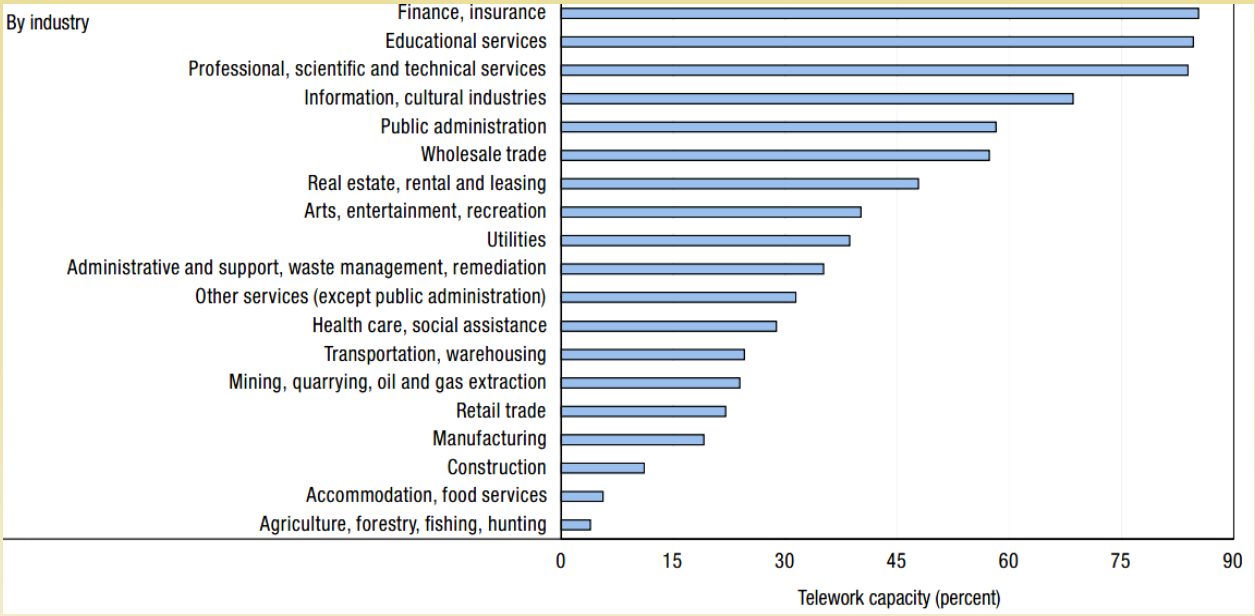
[61] H. Levitt. *Howard Levitt: Why employees can't refuse to return to work because they fear an unsafe workplace*. Financial Post, September 4, 2020.
[62] Statistics Canada, The Daily April 17, 2020.
[63] Statistics Canada. *Canadian Perspectives Survey Series 1: COVID-19 and working from home, 2020*. The Daily, April 17, 2020; and Statistics Canada. *Canadian Perspectives Survey Series 3: Resuming economic and social activities during COVID-19*. The Daily, July 8, 2020.
[64] Z. Deng, D. Messacar, and R. Morissette. *Running the economy remotely: Potential for working from home during and after COVID-19*. STATCAN COVID-19: Data to Insights for a Better Canada, no. 00026. Statistics Canada Catalogue no. 45280001, May 28, 2020.
[65] D. Messacar, R. Morissette and Z. Deng. *Inequality in the feasibility of working from home during and after COVID-19*. STATCAN COVID-19: Data to Insights for a Better Canada, no. 00026. Statistics Canada Catalogue no. 45280001, June 24, 2020.

Figure 1: Telework Capacity in 2019[66]



Telework is most common in knowledge-intensive services such as professional and information and communication technology (ICT) services, and least common in manufacturing and less knowledge-intensive industries, such as wholesale/retail trades, accommodation and food services, agriculture and transportation. High-skilled and high-paying occupations have a greater potential for telework compared to that of low- and medium-skilled and lower-paying occupations. For example, Table 2 (see Deng *et al.* (2020),[67] Chart 1) shows that, in 2019, about 84% of jobs in finance and insurance, educational services and professional, or scientific and technical services in Canada can feasibly perform work from home, whereas only 6% of jobs in accommodation and food services and 4% of those in agriculture, forestry and hunting have the ability to telework. A similar trend was observed during the period from February to April of 2020: more workers shifted to working from home on a large scale in professional, scientific and technical services (75%), finance, insurance and real estate (67%) and public administration (63%). In contrast, less than 10% of jobs in accommodation and food services industries were able to work from home.[68]

Deng and his co-authors also note that telework capacity varies by province. Among all provinces, Ontario has the highest percentage of workers (almost 65%) in industries that can work from home. Meanwhile, provinces with relatively large shares of workers in resource-based sectors such as mining, oil and gas extraction (centered in Alberta, Saskatchewan and Newfoundland and Labrador), and in the agricultural industry (in Manitoba and Prince Edward Island) have low telework capacity.[69]

Next we see an example of how workers not only stopped working at the onset of COVID, but were paid their full salary while doing so.

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[66] Deng, D. Messacar, and R. Morissette. *Running the economy remotely: Potential for working from home during and after COVID-19*. STATCAN COVID-19: Data to Insights for a Better Canada, no. 00026. Statistics Canada Catalogue no. 45280001, May 28, 2020, Chart 1, p. 2.
[67] Z. Deng, D. Messacar, and R. Morissette. *Running the economy remotely: Potential for working from home during and after COVID-19*. STATCAN COVID-19: Data to Insights for a Better Canada, no. 00026. Statistics Canada Catalogue no. 45280001, May 28, 2020.
[68] Z. Deng, D. Messacar, and R. Morissette. *Running the economy remotely: Potential for working from home during and after COVID-19*. STATCAN COVID-19: Data to Insights for a Better Canada, no. 00026. Statistics Canada Catalogue no. 45280001, May 28, 2020; and Statistics Canada. *Labour Force Survey, April 2020*. The Daily, May 8, 2020.
[69] Z. Deng, D. Messacar, and R. Morissette. *Running the economy remotely: Potential for working from home during and after COVID-19*. STATCAN COVID-19: Data to Insights for a Better Canada, no. 00026. Statistics Canada Catalogue no. 45280001, May 28, 2020.

Use of code 699, "Other leave with pay"

Data released by the Treasury Board of Canada Secretariat (TBS) on June 16, 2020 show a total of **76,804** federal employees took "Other leave with pay" (code 699) during the COVID-19 lockdown period between March 15 and May 31, 2020, representing 27% of all federal public workers. The use of code 699 resulted in an estimated cost of **$439 million**.[70] However, TBS was only able to report 62 of 88 federal public service organizations (employing 70% of all federal public servants). Using data on the use of pay code 699 from these 62 organizations, the Parliamentary Budget of Officer (PBO) extrapolates that the total cost incurred from the government's policy of allowing employees from all of 88 federal public service organizations to use pay code 699 for leave related to the COVID-19 pandemic has reached **$632 million** between March 15 and May 31, 2020.[71] The top five federal organizations in terms of code 699 leave expenditure included the *Canada Revenue Agency* ($311 million covering 40,057 employees), *Correctional Service Canada* ($33.9 million covering 8,350 employees), *Canada Border Services Agency* ($15.4 million, covering 4,226 employees), *Employment and Social Development Canada* ($14.6 million covering 6,047 employees), and *Statistics Canada* ($13.9 million covering 3,181 employees).

As per information provided on the *Canadian Association of Professional Employees* (CAPE) website,[72] in situations where a manager determines that working remotely is not at all possible, non-critical federal employees will be eligible for "other leave with pay" (code 699). An *Updated Guidance on Other Leave With Pay (Code 699)* released by the federal government on July 15, 2020 indicates the following:

> As a part of the exceptional measures implemented during the COVID-19 response, the Agency updated its provisions on the use of Other Leave With Pay (Code 699). These leave provisions are intended to support the health and safety of our employees and communities by decreasing the transmission of the virus.
>
> *This guidance will remain in effect until non-critical business is authorized to resume, or as otherwise indicated by the Agency*. This may occur at different times across the country, in accordance with instructions from public health authorities (emphasis added).
>
> Across the federal public service, leave code 699 is used to track the hours employees are not able to work due to COVID-19. Direction on the use of leave code 699 has been evolving as various situations and questions have emerged. To provide clarity on how the leave code 699 applies to employees impacted by COVID-19, Other Leave With Pay (Code 699) is permitted when an employee is in any of the following situations:
>
> **COVID Illness**
>
> - Where an employee has tested positive for COVID-19 or displays symptoms of COVID-19.
> - Where an employee is at high risk for severe illness or living with someone who is at high risk for severe illness and is unable to work remotely.
> - Where an employee is required by a public health official to quarantine (self-isolate) and is unable to work remotely.

[70] Treasury Board of Canada Secretariat's *Follow-Up To The House Of Commons Standing Committee On Government Operations And Estimates*, June 16, 2020; and CBC News. *More than a quarter of federal public servants granted special paid leave during pandemic*, July 22, 2020.
[71] Parliamentary Budget of Officer. *Public Services Use of Paid Leave for Reasons Related to COVID-19*, July 24, 2020.
[72] As per information contained on CAPE website (www.acep-cape.ca/en/).

COVID Family care

- For daycare closures where no alternative arrangement is available.

COVID Technology

- For limitation of an employee's technology, including Virtual Private Network (VPN) access or lack of work equipment/tools to perform their duties from home.

COVID Work Limitation

- Due to the employing department/agency's limited work time due to Business Continuity plans being restricted to critical employees only.
- For any physical limitation not allowing employees to do their work on-site and they are unable to perform their duties from home.

COVID Other

- There are other circumstances directly related to COVID-19 preventing the employee from reporting to work.

In many countries including Canada, public sector workers are a "privileged group" with employment from collective agreement that result in higher wages and benefits than their private sector counterparts.[73] As reported by The *Public Service Alliance of Canada* (PSAC) whose many members work for federal government departments and agencies, most PSAC collective agreements with the federal government have a provision to access paid leave "for other reasons" in the event that an employee is unable to perform his/her duties due to reasons that are not directly attributable to him/her.[74]

Roughly 250,000 federal public servants were working remotely during the COVID-19 lockdown and many of them are expected to continue working remotely for the foreseeable future.[75] Thousands of these federal employees are not actually working because their internet servers could not handle more than "essential" government services, as reported by the National Post,[76] and therefore, are eligible for Code 699 because they experienced limitations on technology to access or lack of work equipment/tools to perform their duties from home.

Below, we investigate hours of work data for Canada and various industries from February to June 2020.

Data on hours of work from Statistics Canada's SEPH database

Brown Economic uses Statistics Canada's data from the *Survey of Employment, Payroll and Hours* **(SEPH)** on a daily basis in its work preparing income loss assessments in civil litigation.[77]

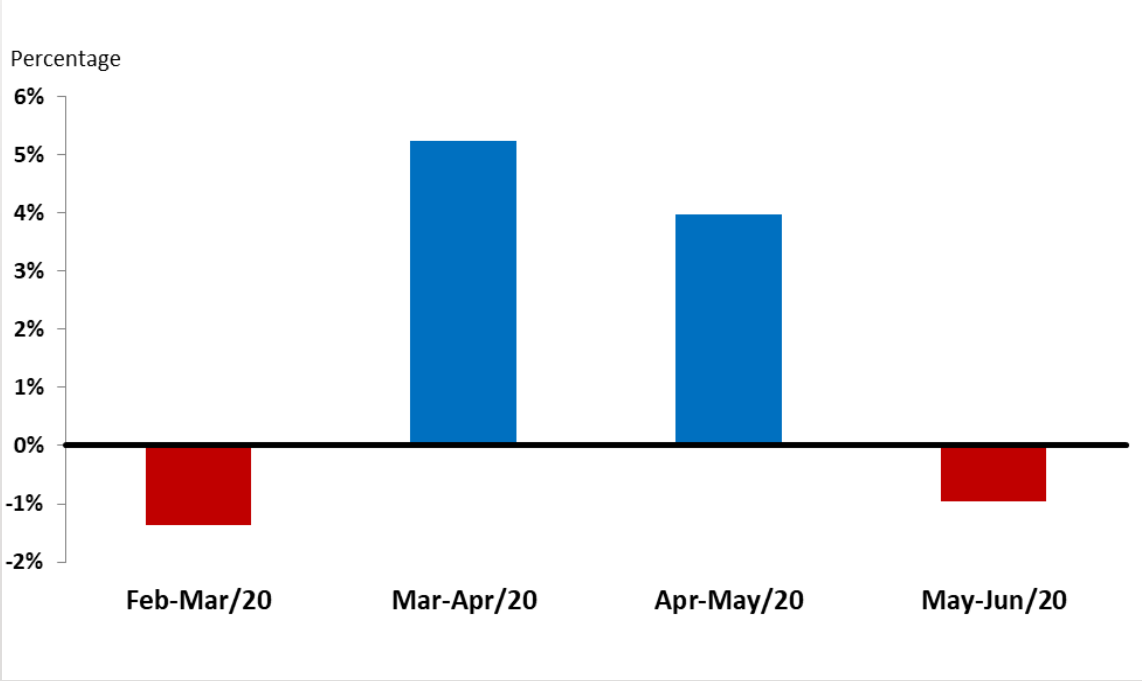
[73] Z. Hasnain. *What about public sector wage bill cuts to finance coronavirus response?*. The World Bank Group, April 6, 2020.
[74] PSAC does not provide a precise definition of "not directly attributable" but they occasionally list examples for the use of leave with pay. These would include weather and road conditions, strikes or lock-outs. (Source: Public Service Alliance of Canada. *"Special leave" with pay Snowstorms/ inclement weather*. Accessed at http://psac-ncr.com/special-leave-pay-snowstormsinclement-weather on October 8, 2020).
[75] L. Berthiaume. *Feds lay out guidelines for public servants' return to workplaces*. The Globe and Mail, June 22, 2020.
[76] C. Nardi. *Thousands of federal employees to receive paid vacation since they can't work from home*. National Post, March 17, 2020.
[77] Brown Economic purchases the complete results from the SEPH data each month from Statistics Canada, which encompasses all 398 NAICS industry codes for each province and territory.

In Part 2 of this newsletter series, we included several graphs which vividly demonstrated that **average weekly wages** declined by a considerable margin in almost all industries from February to March 2020 (Figures 1 through 7 in Part 2) due to the COVID-induced shutdown of the economy.

For this issue (Part 3), we have obtained **hours of work** data from Statistics Canada's *Survey of Employment, Payroll and Hours* **(SEPH),** the only source which publishes hours of work for both salaried employees and **hourly-paid workers**[78] for 398 minor and major industry sector categories.

In Figure 2 below, we see that the broad grouping including all industry sectors obscures the impact of the COVID-induced shutdown. In Figure 2, hours of work decreased by only 1% from February to March 2020, then rebounded by 5% from March to April 2020, increased by another 4% from April to May of 2020, then decreased slightly from May to June 2020. (A decline in average hours worked is represented by the **red** bars, whereas an increase in the average hours worked is represented by the **blue** bars). The negligible declines in March 2020 and June 2020 occur in part because the workers whose hours had been reduced to zero (i.e., they were laid off) are not counted by the SEPH data, since they are no longer working.

Figure 2: Change in Average Weekly Hours for Hourly-paid Employees across All Industries, February to June 2020, Canada



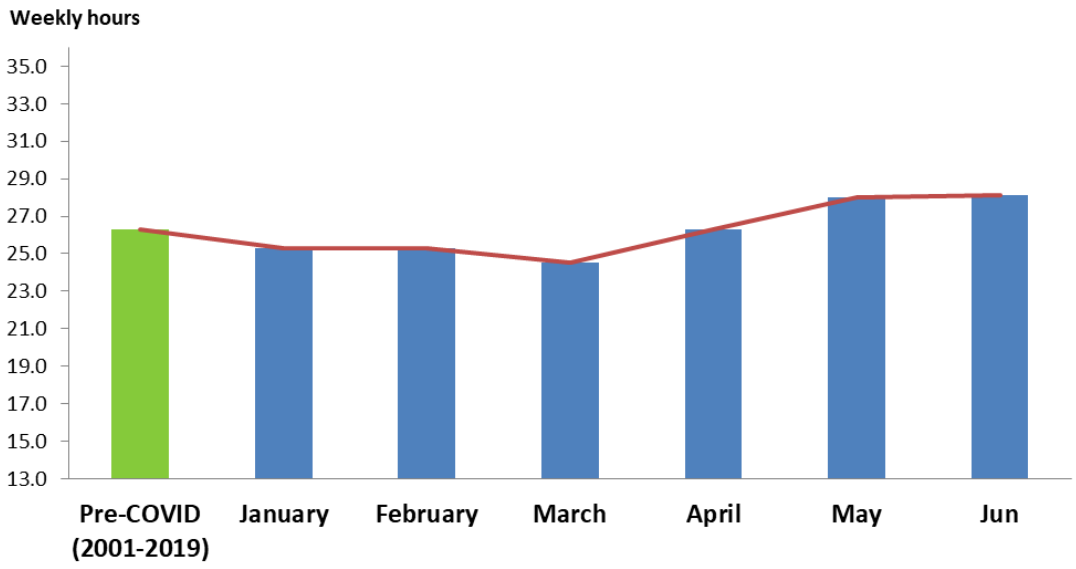
[78] We do not present information about hours of work for salaried employees during the months of February to June 2020 as virtually all industry sectors showed negligible (or no) change. This is due in large part to the SEPH's use of employer records for salaried employees' hours.

In Figures 3, 4 and 5, we map the monthly hours worked for the industries displaying the largest change in hours worked (by hourly paid employees) since February 2020. In each of these figures, the first **green** bar in the graphs shows the average hours worked per week before COVID (averaged from 2001 to 2019). The remaining **blue** bars in each graph depict average hours of work in each month from January to June 2020.

Figures 3, 4 and 5 demonstrate the following:

- In **retail trade** and **accommodation and services** (Figures 3 and 4), pre-COVID weekly hours of work averaged 25 and 23, respectively. This tells us that hourly-paid workers in these industries do not work on a full-time basis
- In both **retail trade** and **accommodation and services** (Figures 3 and 4), average weekly hours decreased in March of 2020, but not by a large margin. Hours of work then rebounded in April, May and June 2020.
- In the **educational services** sector (Figure 5), average hours of work equaled 20, again reflecting a part-time workweek. Given this finding, and that this data is for hourly-paid workers and does not include salaried workers, we assume it omits regular "teaching jobs" and reflects instead industry codes for hourly-paid employees in computer training schools, professional and management development training, fine arts schools, language schools, athletic instruction, and educational support services.[79]
- The **educational services** sector (Figure 5) shows the most massive drop in hours worked compared to pre-COVID levels. From an average 20-hour workweek, these employees' hours declined to 13 per week in January, February and March 2020, rebounded somewhat in April and May of 2020, and by June of 2020 they reached the pre-COVID level.

Figure 3: Average Weekly Hours for Hourly-paid Employees in the Retail Trade Sector (Covers 2.2 million Canadians), January to June 2020, Canada



[79] These industry sectors are represented by NAICS codes 6114, 6116, and 6117.

Figure 4: Average Weekly Hours for Hourly-paid Employees in Accommodation and Food Services
(Covers 1.2 million Canadians), *January to June 2020, Canada*

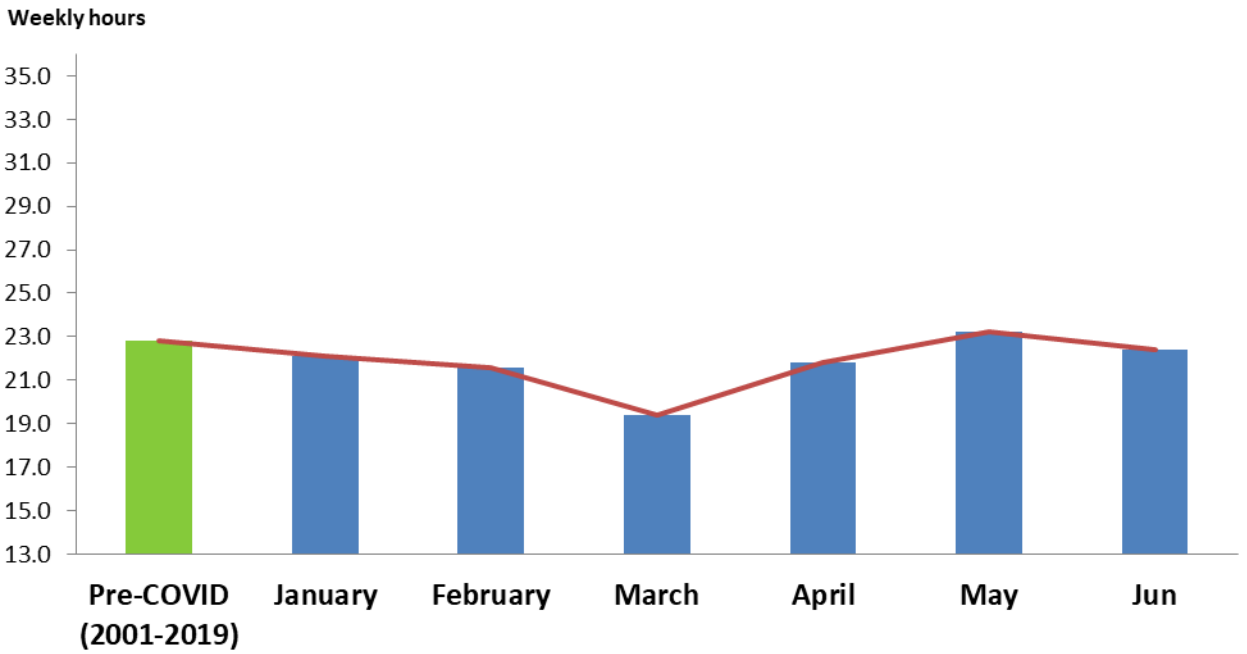
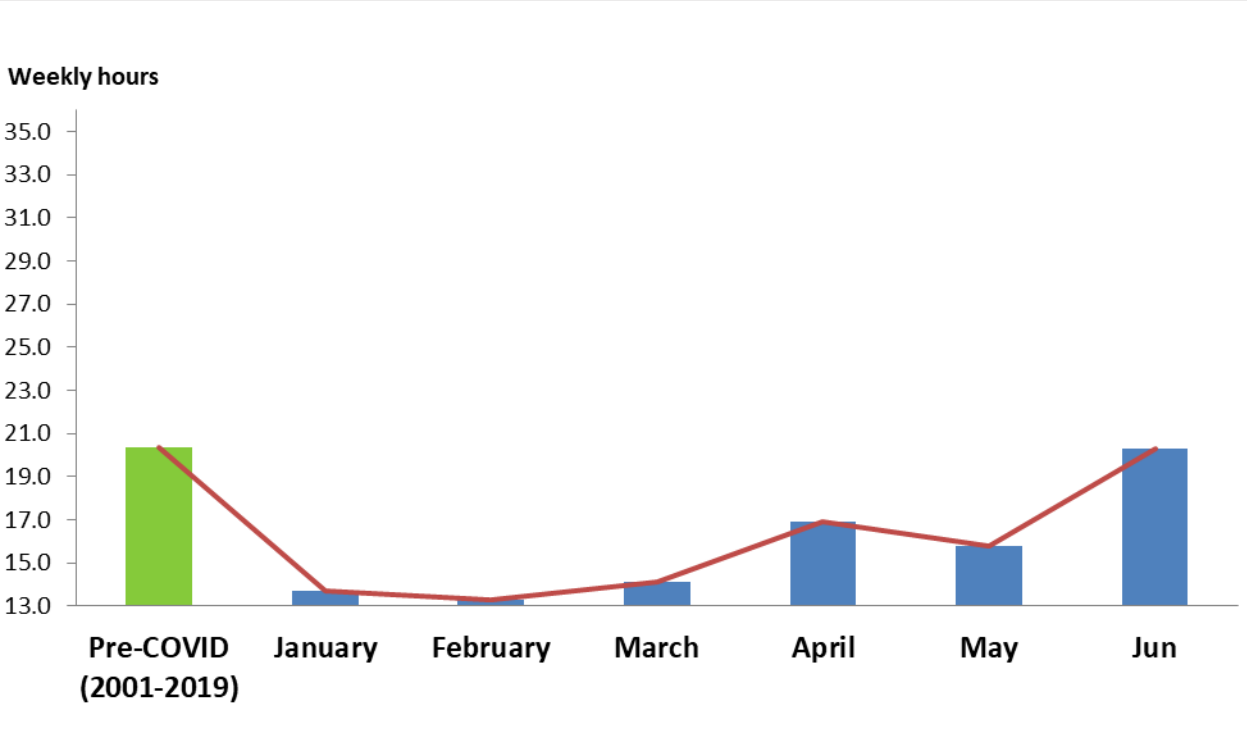


Figure 5: Average Weekly Hours for Hourly-paid Employees in Educational Services
(Covers 1.4 million Canadians), *January to June 2020, Canada*



Forecasts of productivity growth in Canada

Productivity growth in the Canadian economy has been considerably slower in the post-2000 period than in the pre-2000 period, as indicated by the *Centre for the Study of Living Standards* (CSLS).[80] Canada's productivity ranking has declined from 3rd place among OECD countries in 1960 to 17th place over the past two decades.[81] Baldwin *et al.*[82] (2014) found that the deterioration in labour productivity in the post-2000 period primarily resulted from the decline in multi-factor productivity (MFP).[83] In measuring the contribution of each of these effects on the growth in labour productivity from 1961 to 2012 in Canada, Statistics Canada concluded that the 1.9% yearly increase in labour productivity growth that occurred during this period resulted from a 1.0% increase in capital intensity; 0.4% increase in higher skill levels of workers; and a 0.5% increase in multifactor productivity (MFP). Similarly, the CSLS calculated using data from 1997 to 2017 in Canada that of the 1.4% average annual rate of labour productivity growth for the business sector, 0.9% resulted from contributions of capital services intensity; 0.3% resulted from an increase in "labour productivity"; and 0.2% from MFP growth.[84]

As noted by Timothy Lane, the Deputy Governor of the Bank of Canada, productivity growth has been historically pro-cyclical, rising in boom periods and falling in recessions:

> … productivity growth tends to vary over the cycle, declining in the downturn and then rising during the recovery as labour is more fully utilized … *The [2008-09] recession may also have more persistent implications for productivity growth*. First, investment has fallen off sharply, which in turn reduces the growth of capital per worker – even as labour is shed. And, because capital investment often embodies new technology, reduced investment will dampen MFP growth. Second, investment in research and development is likely to suffer even more in the downturn. Third, as I noted earlier, the ongoing process of sectoral adjustment and reallocation of resources dampens productivity growth during the adjustment process. The adjustments now occurring in several sectors of the Canadian economy, including automobiles and forest products, are a particularly important example. *Both physical capital and human capital – in the form of industry-specific and firm-specific skills – are also inevitably lost in such an adjustment* (emphasis added).[85]

Similarly, CSLS notes that:[86]

> … productivity growth is very cyclical in the short term because of lags in the adjustment of labour input to fluctuations in output. Productivity can soar in years of strong growth such as 1976 and 1999 and turn negative in years of recession such as 2008 and 2009.

[80] A. Sharpe and J. Tsang. *The Stylized Facts About Slower Productivity Growth in Canada*. Centre for the Study of Living Standards, June 1-3, 2018.
[81] Timothy Lane, Deputy Governor of the Bank of Canada. *The Canadian Economy Beyond the Recession.* Bank of Canada, August 25, 2009.
[82] J. R. Baldwin, W. Gu, R. Macdonald and B. Yan. *Productivity: What Is It? How Is It Measured? What Has Canada's Performance Been Over the Period 1961 to 2012?*. Statistics Canada Catalogue no. 15-206-X, September 15, 2014, p. 10.
[83] Multi-factor productivity is defined as "output per unit of combined capital and labour", which is a broader definition than labour productivity (output per unit of labour). MFP is believed to capture increases in output (GDP) due to increases in efficiency, where efficiency is defined broadly to include changes in plant size, organizational change, and technological change. (Source: Gu, Kaci, Maynard and Sillamaa, "The Changing Composition of the Canadian Workforce and its Impact on Productivity Growth" in *Productivity Growth in Canada* (Minister of Industry: Statistics Canada), catalogue no. 15-204-XIE, 2002).
[84] Sharpe, A., and Tsang, J. *A Detailed Analysis of Newfoundland and Labrador's Productivity Performance, 1997-2018*. Centre for the Study of Living Standards, September 2019, p. 112.
[85] Timothy Lane, Deputy Governor of the Bank of Canada. *The Canadian Economy Beyond the Recession.* Bank of Canada, August 25, 2009.
[86] A. Sharpe and J. Tsang. *The Stylized Facts About Slower Productivity Growth in Canada*. Centre for the Study of Living Standards, June 1-3, 2018.

Results from the Bank of Canada's *Business Outlook Survey* (Summer 2020) show that business sentiment is strongly negative in all sectors due to impacts from the COVID-19 pandemic and the drop in oil prices. Nearly half of all businesses reported a significant decline in their sales in the past 12 months and the majority of firms reported that they are operating below capacity. Because of weak demand related to the pandemic, expectations for input and output price growth as well as for inflation are down considerably compared to the results from the last survey (Winter 2019-20 – pre-pandemic period). The majority of businesses intend to cut their investment spending significantly due to reasons related to the pandemic. The survey also shows that tightening credit unions and less favorable terms and conditions were widespread across sectors. Bivens wrote (pre-COVID) that a combination of these factors (weak sales, capacity pressures, downward price pressures, and tightened credit unions) eventually results in weak productivity growth.[87]

The Chief Actuary of the *Canada Pension Plan* (CPP) forecasts 1% per year for productivity as of 2025 when estimating the pool of money required to fund CPP claims for the following 70 years.[88] This forecast is for the Canadian economy, and obscures differences in productivity growth by industry sector.

Forecasts of productivity growth by industry sector

In Table 2 below, we show the forecasts utilized in Brown Economic's income loss assessments for the productivity increase to apply to workers' incomes in the future loss period,[89] which vary according to industry sector.[90] These forecasts are based on a combination of industry-sector data from the *Centre for the Study of Living Standards* (CSLS) and the *Long Term Outlook for the Canadian Economy: NATIONAL PROJECTION THROUGH 2050* prepared by the University of Toronto's *Policy and Economic Analysis Program* (PEAP) in August of 2020.

Table 2 shows that productivity increases vary by industry sector, ranging from 0.20% to 1.75% per year. For the total economy (aggregate of all industry sectors), we include productivity increases of 1.30% per year from 2024 onward. For 2021, 2022 and 2023, we use staggered rates of 0.00%, 0.50% and 0.80%, respectively, to reflect the anticipated impact of COVID-19 and consistent with PEAP's forecasts in these years.

[87] J. Bivens. *A 'high-pressure economy' can help boost productivity and provide even more 'room to run' for the recovery*. Economic Policy Institute, March 12, 2017.
[88] Office of the Superintendent of Financial Institutions Canada's *Actuarial Report on the Canada Pension Plan as at 31 December 2018*. The 2018 actuarial report is the most recent one released by the Office of the Superintendent of Financial Institutions Canada. It was made available on Dec. 10, 2019.
[89] In the past loss period (date of incident to date of valuation/trial), productivity is accounted for in the use of Statistics Canada's *Survey of Employment, Payroll and Hours* (SEPH), which is reported by industry sector and province.
[90] For a discussion on how and why productivity growth varies by industry sector, see C.L. Brown, **Damages: Estimating Pecuniary Loss** (Toronto, Ontario: Canada Law Book, a Thomson Reuters business), chapter 3, section **3.3.b.ii Sources of Data to Measure Productivity Increases;** section **3.3.b.ii(1) How and Why Does Productivity Vary?;** section **3.3.b.ii(2) Applying Productivity Increases to People's Wages;** and section **3.3.c Factors Affecting Productivity Growth.**

Table 2: Forecasts of productivity growth by industry sector

Sector	NAICS Code[1]	Productivity Forecast
Total Economy	-	1.30
Agriculture, forestry, fishing & hunting,	11	1.50
Mining & oil & gas extraction,	21	1.00
Utilities (and electrical power)	22	1.25
Construction	23	0.50
Manufacturing	31-33	1.00
Wholesale trade	41	1.00
Retail trade	44-45	0.90
Transportation & warehousing	48-49	1.00
Information & cultural industries	51	0.75
Finance, Insurance, Real Estate & Management of Companies	52, 53, 55	1.75
Professional, scientific & technical services	54	0.75
Administrative and support, waste manag. and remediation srvcs.	56	0.50
Educational services	61	
Provincial Government	61	0.20
Local Government	61	0.20
Private	61	0.20
Health care & social assistance	62	0.50
Provincial Government Hospital & Social Services	62	0.75
Private	62	0.50
Arts, entertainment & recreation	71	0.50
Accommodation & food services	72	0.75
Other services (except public admin.)	81	Use "Total Economy"
Public admin. - All levels of government	91	1.00
Federal - Defence	9111	1.25
Federal - Civil	9112-9119	1.00
Provincial	912	Use "Public Admin" (NAICS 91)
Municipal	913	0.75

Sources: Based on historical trends and forecasts (as published in the Canadian Institute of Actuaries' *Report on Canadian Economic Statistics 1924 – 2019 Final Release* , August 2020, Document 220118; Centre for the Study of Living Standards' *A Detailed Analysis of Newfoundland and Labrador's Productivity Performance, 1997-2018* , CSLS Research Report 2019-06, September 2019; Centre for the Study of Living Standards' *Economic Projections for Canada and the Provinces 2017-2038: An Update* , August 2018; Centre for the Study of Living Standards' *Estimates of Labour, Capital and Multifactor Productivity by Province and Industry, 1997-2010* , March 7, 2012; Centre for the Study of Living Standards' *Productivity: Key to Economic Success* , March 1998; Statistics Canada's Table: 36-10-0480-01 (formerly CANSIM 383-0033), *Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts* ; and Office of the Parliamentary Budget Officer's *PBO and Finance Canada Long-term Projection Comparison* , January 17, 2019).

[1] Statistics Canada *North American Industry Classification System (NAICS) - Canada* , 2017, Catalogue no. 12-501-X.

Consumer Price Index

Unemployment Rate

From August 2019 to August 2020* (rates of inflation)		For the month of August 2020	
Canada**	0.1%	Canada:	10.2%
Vancouver:	-0.2%	Vancouver:	12.8%
Toronto:	-0.4%	Toronto:	13.9%
Ottawa:	0.9%	Ottawa:	9.5%
Montréal:	0.4%	Montréal:	11.8%
Edmonton:	0.6%	Edmonton:	13.6%
Calgary:	0.6%	Calgary:	14.4%
Halifax:	-0.4%	Halifax:	10.1%
St. John's, NF:	-0.4%	St. John's, NF:	15.1%
Saint John, NB:	-0.3%	Saint John, NB:	9.7%
Charlottetown (PEI):	-0.3%	Charlottetown (PEI):	10.7%
* Using month-over-month indices. Source: Statistics Canada			
** 12 month rolling average up to August 2020 is 1.1% (see table above).			

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Updating Non-Pecuniary Awards for Inflation (Aug. 2020, Canada)

Year of Accident/ Year of Settlement or Trial	"Inflationary" Factors*	Non-Pecuniary Damages - Sample Awards $10,000	$25,000	$50,000	$75,000	$100,000
August 2019-August 2020	1.011	$10,115	$25,287	$50,574	$75,861	$101,147
Avg. 2018-August 2020	1.024	$10,244	$25,609	$51,218	$76,827	$102,437
Avg. 2017-August 2020	1.048	$10,475	$26,188	$52,377	$78,565	$104,754
Avg. 2016-August 2020	1.064	$10,643	$26,607	$53,213	$79,820	$106,426
Avg. 2015-August 2020	1.079	$10,795	$26,987	$53,974	$80,961	$107,948
Avg. 2014-August 2020	1.092	$10,916	$27,291	$54,582	$81,873	$109,164
Avg. 2013-August 2020	1.112	$11,124	$27,811	$55,622	$83,433	$111,244
Avg. 2012-August 2020	1.123	$11,229	$28,072	$56,143	$84,215	$112,286
Avg. 2011-August 2020	1.140	$11,399	$28,498	$56,996	$85,493	$113,991
Avg. 2010-August 2020	1.173	$11,731	$29,327	$58,655	$87,982	$117,309
Avg. 2009-August 2020	1.194	$11,940	$29,850	$59,700	$89,550	$119,401
Avg. 2008-August 2020	1.200	$11,997	$29,992	$59,983	$89,975	$119,967
Avg. 2007-August 2020	1.226	$12,259	$30,648	$61,297	$91,945	$122,593
Avg. 2006-August 2020	1.252	$12,521	$31,303	$62,605	$93,908	$125,211
Avg. 2005-August 2020	1.277	$12,772	$31,929	$63,858	$95,787	$127,715
Avg. 2004-August 2020	1.305	$13,055	$32,637	$65,273	$97,910	$130,547
Avg. 2003-August 2020	1.330	$13,297	$33,243	$66,487	$99,730	$132,973
Avg. 2002-August 2020	1.366	$13,664	$34,161	$68,322	$102,483	$136,644
Avg. 2001-August 2020	1.397	$13,973	$34,933	$69,866	$104,799	$139,732
Avg. 2000-August 2020	1.432	$14,325	$35,812	$71,624	$107,436	$143,248
Avg. 1999-August 2020	1.472	$14,715	$36,788	$73,576	$110,363	$147,151
Avg. 1998-August 2020	1.497	$14,970	$37,425	$74,849	$112,274	$149,699
Avg. 1997-August 2020	1.512	$15,119	$37,797	$75,595	$113,392	$151,190
Avg. 1996-August 2020	1.536	$15,364	$38,409	$76,819	$115,228	$153,638
Avg. 1995-August 2020	1.561	$15,606	$39,015	$78,030	$117,045	$156,059
Avg. 1994-August 2020	1.594	$15,941	$39,852	$79,705	$119,557	$159,410
Avg. 1993-August 2020	1.597	$15,967	$39,918	$79,835	$119,753	$159,670
Avg. 1992-August 2020	1.627	$16,265	$40,664	$81,327	$121,991	$162,655
Avg. 1991-August 2020	1.651	$16,507	$41,268	$82,536	$123,804	$165,072
Avg. 1990-August 2020	1.744	$17,436	$43,590	$87,181	$130,771	$174,362
Avg. 1989-August 2020	1.827	$18,271	$45,677	$91,355	$137,032	$182,709
Avg. 1988-August 2020	1.918	$19,182	$47,954	$95,908	$143,861	$191,815
Avg. 1987-August 2020	**1.995**	$19,952	$49,880	**$99,759**	$149,639	$199,518
Avg. 1986-August 2020	2.082	$20,821	$52,053	$104,107	$156,160	$208,214
Avg. 1985-August 2020	2.169	$21,694	$54,235	$108,471	$162,706	$216,942
Avg. 1984-August 2020	2.255	$22,554	$56,384	$112,768	$169,152	$225,536
Avg. 1983-August 2020	2.352	$23,524	$58,811	$117,622	$176,433	$235,244
Avg. 1982-August 2020	2.491	$24,905	$62,263	$124,526	$186,789	$249,052
Avg. 1981-August 2020	2.759	$27,585	$68,963	$137,927	$206,890	$275,853
Avg. 1980-August 2020	3.103	$31,031	$77,578	$155,156	$232,733	$310,311
Avg. 1979-August 2020	3.417	$34,175	$85,436	$170,873	$256,309	$341,746
Jan. 1978-August 2020	**3.893**	$38,926	$97,315	$194,630	$291,944	**$389,259**

$99,759= $50,000 x 1.995 represents the dollar equivalent in August 2020 of $50,000 based on inflation increases since 1987. Similarly, $389,259 (=$100,000 x 3.893) represents the dollar equivalent in August 2020 of $100,000 in 1978 based on inflationary increases since the month of January 1978.

* Source: Statistics Canada, Consumer Price Index, monthly CPI release, rolling average (except for Jan. 1978).

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