

Reducing the Work Week Through Improved Productivity



by Steven Globerman and Joel Emes

Summary

- Increased leisure time is an important contributor to a higher standard of living for Canadians. Obviously, so is increased monetary income which allows Canadians to buy more goods and services. Higher real (inflation adjusted) workplace compensation is therefore obviously critical to allowing Canadians to enjoy more leisure time without suffering a decline in their material standards of living.
- The key to increasing workplace compensation is improved labour productivity performance. Economic theory and empirical evidence show a tight linkage between labour productivity growth and increased hourly compensation to workers.
- This bulletin illustrates the potential for Canadian workers to enjoy substantially increased leisure time, while maintaining, and even in-

creasing, their total monetary compensation, through improvements in labour productivity.

- Specifically, if labour productivity growth averages 2 percent per year from 2018 to 2030, Canadian workers in 2030 could work a four-day work week year-round while enjoying a higher material standard of living than they enjoyed in 2018.
- How realistic is it to aim for a 2 percent per year increase in labour productivity in Canada? It would about double the productivity growth rate experienced in recent years. However, since labour productivity in Canada's business sector increased at around 2 percent a year from 1961 to 2012 the target is not unrealistic, and the goal of returning to the country's long-run productivity growth performance deserves a prominent place on the policy agendas of the federal and provincial governments.

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Introduction

Increased leisure time is a meaningful contributor to a society's standard of living. However, at any given point, there is an unavoidable tradeoff between the monetary income that individuals earn, which, in turn, provides the means for purchasing goods and services, and the quantity of leisure time that they can consume. Specifically, consuming more leisure time means that an individual will typically earn less monetary income and, therefore, will have less to spend on goods and services. Over time, however, as an individual's hourly earnings increase, he or she will be able to enjoy more leisure time while still being able to purchase the same (or an even larger) basket of goods and services, assuming that the earnings increase exceeds any increase in the cost of living. Improved productivity is the source of increases in labour income. Hence, productivity increases are the key to improving standards of living as manifested in both increased consumption of goods and services and increased leisure.

This bulletin discusses the potential for Canadians to work fewer hours while earning higher real incomes as a consequence of faster productivity growth. This phenomenon has been the case in the past, although a recent slowdown in productivity growth has limited the ability of Canadians to maintain their real standards of living while working fewer hours. The bulletin identifies the specific increase in Canada's future productivity growth rate that would enable Canadians to work 4 days a week rather than the "conventional" 5 days a week, while maintaining their real (i.e., inflation-adjusted) levels of monetary income.

The bulletin begins by providing data on the annual average compensation that Canadians earned from 2000 to 2018 along with the average number of hours they worked annually. In-

flation-adjusted annual average compensation increased by around 13 percent over the period, while average annual hours of work decreased by approximately 4 percent. This combination of higher incomes and fewer hours worked is the consequence of an increase in the average annual compensation per hour worked. The following section considers the tradeoff between higher real incomes and reduced work hours. Specifically, it identifies the sacrifice in compensation that Canadian workers would have needed to accept to have been able to work a 4-day work week by 2018 given the actual increase in real average annual compensation between 2000 and 2018. In fact, the average worker could have chosen to maintain their 2000 compensation level and had 4-day work weeks for more than half the year. Further, those choosing to work eight-hour days could already be at 4-day work weeks all year. We go on to identify the increase in real average annual compensation per hour that would have enabled Canadians to work a 4-day week, while earning real average annual compensation equal to that actually earned in 2018. To do so, real average annual compensation would have had to have increased at about 1.6 times the actual rate of increase between 2000 and 2018. Since theoretically growth in real compensation is closely tied to growth in labour productivity, this is equivalent to saying that the growth in labour productivity would have needed to be 1.6 times the rate it actually was over the 2008 to 2018 period.

We go on to show that if Canada's labour productivity growth rate increases to around 2 percent a year from 2018 to 2030, the average Canadian worker could work a 4-day work week by 2030 and still earn an extra \$900 of annual compensation in inflation-adjusted terms. We also report some empirical evidence supporting the close linkage between the

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Table 1: Average Annual Hours Worked in Canada

Year	Average Annual Hours
2000	1,787
2001	1,774
2002	1,755
2003	1,745
2004	1,755
2005	1,745
2006	1,744
2007	1,744
2008	1,741
2009	1,712
2010	1,715
2011	1,714
2012	1,721
2013	1,716
2014	1,710
2015	1,711
2016	1,706
2017	1,692
2018	1,707

Statistics Canada, 2020d.

growth in labour productivity and the growth in real annual average compensation. We summarize the short-run and long-run behaviour of labour productivity in Canada. While a 2 percent per annum increase in labour productivity is consistent with Canada's long-run experience, it would represent a substantial improvement from productivity growth rates in recent years.

Figure 1: Average Annual Hours Worked in Canada



Statistics Canada, 2020d.

Work hours and incomes of Canadians—recent experience

Average hours of work in Canada have decreased fairly consistently over approximately the past two decades. Table 1 and figure 1 report the average annual hours worked per worker in Canada from 2000 to 2018.¹ The table 1 data show that Canadians worked 80 fewer hours, on average, in 2018 compared to 2000. This is a fairly modest decrease of 4.5 percent over the 18-year sample period. Furthermore, the reduction in average annual hours worked between 2000 and 2018 is not a statistical artifact of an increase in part-time relative to full-time work. Full-time employees accounted for

¹ The annual average of hours worked per job in all categories of jobs.

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Table 2: Average Annual Compensation in Canada

Year	\$ 2018
2000	54,799
2001	54,904
2002	54,362
2003	53,961
2004	54,985
2005	55,890
2006	57,277
2007	58,319
2008	58,724
2009	59,111
2010	58,756
2011	59,117
2012	60,102
2013	61,143
2014	61,839
2015	62,362
2016	60,865
2017	61,171
2018	61,691

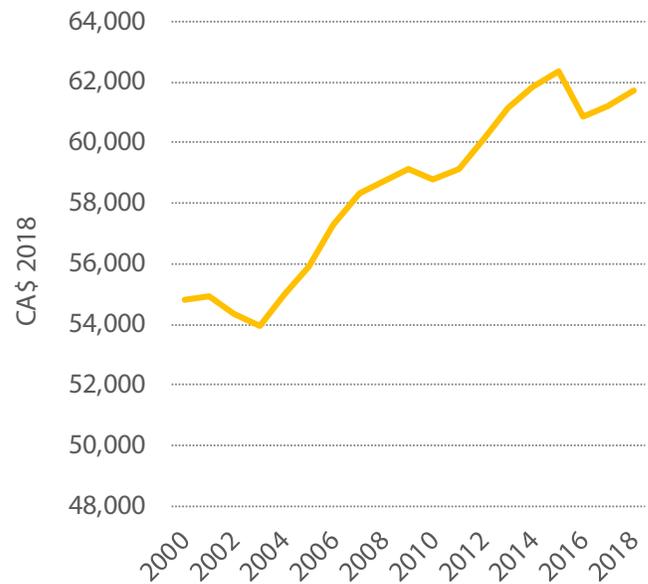
Statistics Canada, 2020d; 2020e.

81.9 percent of total Canadian employment in 2000. This percentage decreased marginally to 81.3 percent in 2018.²

While there was a relatively modest decline in the average annual hours worked between 2000 and 2018, there was a substantially larger increase in average annual compensa-

² The percentage of full-time employees in Canada's work force averaged around 81.2 percent over the full 2000-2018 period (see Statistics Canada, 2020a).

Figure 2: Average Annual Compensation in Canada (\$ 2018)



Statistics Canada, 2020d; 2020e.

tion in constant dollars.³ This is seen in table 2 and figure 2, which report average annual compensation in 2018 constant prices for the years from 2000 to 2018.⁴ The constant dollar annual average compensation is, in fact, lower in 2018 than it was in 2015; however, it was approximately 13 percent higher in 2018 compared to 2000. Hence, Canadian workers, on average, enjoyed a higher material standard

³ Compensation of employees comprises wages and salaries, as well as employers' social contributions, where the latter includes employers' contributions to employee welfare, pensions, workers' compensation, and employment insurance (see Statistics Canada, 2020b).

⁴ Total compensation per hour worked (for all jobs, in 2018 dollars) times average annual hours worked per job in all categories of job.

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Table 3: Average Compensation per hour Worked in Canada

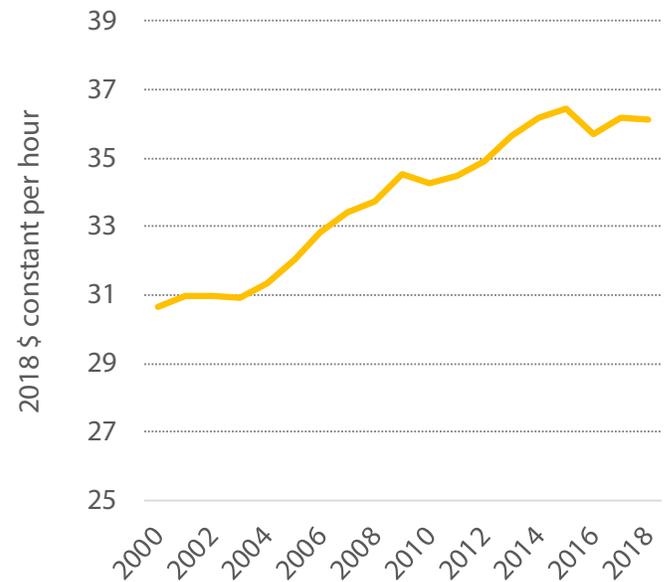
Year	\$ 2018
2000	30.67
2001	30.95
2002	30.98
2003	30.92
2004	31.33
2005	32.03
2006	32.84
2007	33.44
2008	33.73
2009	34.53
2010	34.26
2011	34.49
2012	34.92
2013	35.63
2014	36.16
2015	36.45
2016	35.68
2017	36.15
2018	36.14

Statistics Canada, 2020d; 2020e.

of living in 2018 compared to 2000 while working fewer hours.

Achieving the combination of more leisure time and a higher material standard of living clearly implies that Canadian workers, on average, earned more compensation per hour worked in 2018 than in 2000. The data reported in table 3 document the increase in compensation per hour over the sample period. Specifically, average compensation per hour increased by almost 18 percent between 2000 and 2018. It is worth highlighting that all dollar values in this report are in constant 2018 dollars. This effectively

Figure 3: Average Compensation per hour Worked in Canada (\$ 2018)



Statistics Canada, 2020d; 2020e.

means that the purchasing power of the “average” worker in Canada increased from 2000 to 2018 by almost a fifth for each hour worked.⁵

The data presented to this point suggest that Canadian workers prefer a combination of higher real compensation and more leisure time rather than taking all of their higher average hourly compensation in the form of either increased income or increased leisure time. Indeed, the modest percentage decline in average annual hours of work between 2000 and 2018 suggests that the “income elasticity” of leisure time is substantially smaller than the average income elasticity for goods and services.⁶

⁵ Total compensation per hour worked (for all jobs, in 2018 dollars).

⁶ Income elasticity measures the percentage change in the quantity of any good or service consumed re-

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As long as labour markets are relatively competitive, there is no reason to believe that Canadian workers will wind up with a mix of higher real compensation and increased leisure that is significantly different from their preferred mix as their real hourly compensation increases.⁷ Nevertheless, it is interesting to consider how much more leisure time Canadian workers could have enjoyed in 2018 had they chosen to take all of the benefits of higher real compensation in the form of increased leisure time.

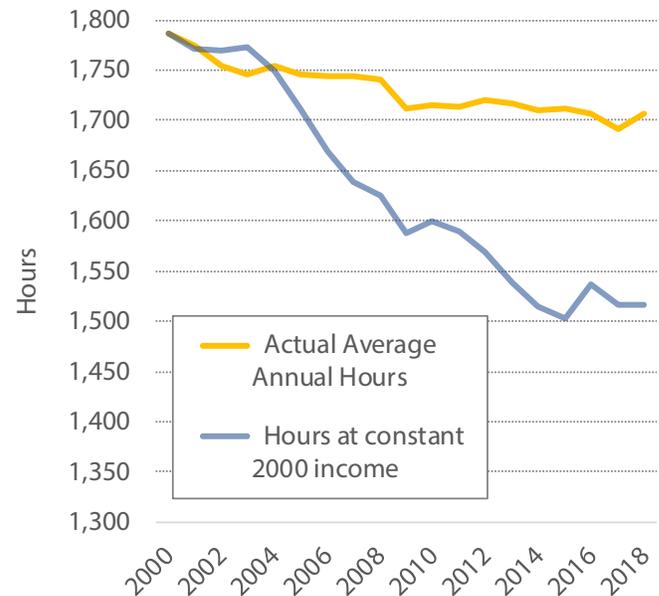
What if Canadians had wanted more leisure?

While certainly conjectural, assume for convenience that productivity improvements would have allowed Canadian workers to earn the observed 2018 average compensation of \$36.14 per hour, even if they worked substantially fewer hours than the 1,707 average annual hours actually worked in 2018. This is equivalent to assuming that increases in labour productivity are independent of the average number of annual hours worked and that increases in labour productivity pass through to increases in average

lated to the percentage change in real income holding relative prices constant. Of course, the relative price of leisure implicitly increased between 2000 and 2018 since the average hourly wage increased. This relative price change likely discouraged some substitution at the margin towards more leisure and away from work.

⁷ A complication that we do not address here is that government intervention, specifically in the form of increased CPP contribution rates, interfere in Canadian workers' decisions about the leisure time/compensation trade-off. Canadian governments have, in effect, made part of this trade-off decision for all Canadian workers by mandating that more of their compensation be devoted to Canada Pension Plan contributions.

Figure 4: Average Number of Hours Worked Annually in Canada



Statistics Canada, 2020d; 2020e.

hourly compensation.⁸ Given this assumption, if Canadian workers cared only about increased leisure time, the average full-time worker could have earned \$54,799 (real annual average compensation in 2000) while working only 1,516 annual hours in 2018.⁹ This is fully 191 fewer hours of work annually than the actual number of hours worked in 2018 by the average worker.

Put simply, if Canadian workers cared only about increasing their leisure time, the average worker could have taken 191 more hours of leisure time in 2018 than they actually took while

⁸ The empirical relationship between changes in productivity and changes in average labour income will be discussed later.

⁹ The number of hours required to earn **the average** 2000 income of \$54,799 at 2018 average compensation is: $\$54,799 / \$36.14 / \text{hour} = 1,516$ hours.

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maintaining the same real income level they enjoyed in 2000 (see figure 4). To put this hypothetical increase in annual hours of leisure time into sharper context, the increase might be translated into days of work per week. Dividing the average annual number of hours worked in Canada by the total number of employed persons yields 36.6 hours per week across all jobs (Statistics Canada, 2020c). Assuming a 36.6-hour work week, a Canadian worker would have worked, on average, 46.6 weeks in 2018.¹⁰ Reducing the total hours to 80 percent of the current total, or 1,366 hours, would equal a one-day-per-week reduction in a five-day work week, or 341 fewer hours worked in a year.

As noted above, at 191 hours per year, Canadian workers on average could have chosen to maintain their 2000 compensation level and enjoyed 4-day work weeks for more than half the year. Further, those choosing to work 8.0-hour days rather than 7.3-hour¹¹ days could have achieved a year-round 4-day work week by 2018. The Canada Labour Code defines standard hours of work as “eight hours in a day and 40 in a week...” (Canada, 2017). The average full-time Canadian worker could therefore have taken increased leisure time in the form of a year-round 4-day work week, since working 4 (eight hour) days per week for 46.6 weeks would equate to almost 1,516 annual hours of work in 2018.¹²

¹⁰ This estimate is simply the average annual hours worked in 2018 (1,707) divided by 36.6.

¹¹ Five days at the average 36.6-hour week works out to 7.32 hours per day.

¹² The precise number of required hours per day of work in a 4-day work week that would result in 1,516 annual work hours is 8.125.

Realizing more leisure time and higher real compensation

The compound average annual growth in compensation per hour worked between 2000 and 2018, which equals 0.92 percent, is clearly inadequate to have allowed Canadian workers to enjoy average annual compensation of \$61,691 in 2018 while working a 4-day week. To realize the \$61,691 average annual compensation while only working 1,516 annual average hours in 2018, the average compensation per hour would have needed to be about \$40.69, or about 13 percent higher than the actual hourly compensation in 2018. In turn, this implies that the average annual compensation per hour would have needed to increase by around 33 percent between 2000 and 2018. To the extent that hourly compensation growth is completely a function of productivity growth, an issue that we will discuss next, labour productivity would also have had to increase by around 33 percent between 2000 and 2018 to give rise to the required \$40.69 average annual hourly compensation.¹³

By way of context, table 4 reports an index of labour productivity for all Canadian industries from 2000 to 2018. Labour productivity is a measure of real output per hour of work, and the index covers both the private and the public sector. In fact, the index of labour productivity was approximately 19 percent higher in 2018 than in 2000. Hence, to have enjoyed a 4-day work week in 2018 while earning real annual compensation that was actually earned in 2018, labour productivity from 2000–2018 would have had to increase at about 1.6 times the realized rate of increase.

¹³ This assumes that the faster growth in productivity would have been “passed through” completely to a faster growth in average annual hourly compensation.

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Table 4: Labour Productivity, All Industries, Chained (2012) Dollars per Hour

Year	Productivity
2000	50.0
2001	50.7
2002	51.6
2003	51.8
2004	52.3
2005	53.5
2006	54.1
2007	54.1
2008	53.8
2009	53.8
2010	54.6
2011	55.6
2012	55.8
2013	56.7
2014	58.1
2015	58.1
2016	58.3
2017	59.5
2018	59.4

Statistics Canada, 2020d.

As will be discussed next, Canada's labour productivity grew by close to 2.0 percent per year between 1961 and 2012. It is therefore interesting to assess the opportunity for Canadian workers to enjoy a 4-day work week in the future if labour productivity grows by 2 percent per year from 2018 to 2030. Assume initially that full-time and full-time-equivalent workers in Canada will work the same number of hours (1,707) in 2030 as they did in 2018. If the assumed 2 percent per annum productivity

growth was passed through to workers in the form of higher average annual hourly compensation, workers would earn \$78,239 in 2030 (in 2018 dollars). Equivalently, they would earn an annual average hourly compensation of \$45.83.

Moving to a 4-day work week would obviously reduce expected average annual compensation in 2030. Decreasing hours worked by 20 percent such that someone at a 40-hour, 5-day-a-week job could move to a 32-hour, 4-day-a-week job would entail 1,366 average annual hours of work in 2030 or a reduction of about 341 annual hours compared to 2018. Hence, the average worker would need to forego \$15,648 in real 2018 dollars ($\$45.83 \times 341$) in order to reduce the work week from 5 to 4 days. The projected annual average compensation in 2030 would therefore be \$62,591 with the associated 4-day work week. It should be noted that this latter average annual real compensation would still be \$900 or 1.5 percent higher than the average annual compensation in 2018.

Whether Canadian workers would prefer to work more than 4 days a week and earn commensurately more in real compensation is an open issue. The main point is that increased real hourly compensation tied to improved productivity offers Canadians a realistic option of working less while earning higher real compensation. The preceding numerical illustration assumed a 2 percent per annum increase in real average hourly compensation tied to a 2 percent per annum increase in labour productivity. As noted above, an annual 2 percent increase in labour productivity is not inconsistent with long-run experience. At issue is whether real compensation growth is consistently tied to labour productivity growth over time.

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Table 5: Indices of Average Annual Compensation per Hour and Labour Productivity

Year	Compensation/ Hour	Labour Productivity
2000	100.0	100.0
2001	100.9	101.4
2002	101.0	103.2
2003	100.8	103.6
2004	102.2	104.6
2005	104.4	107.0
2006	107.1	108.2
2007	109.0	108.2
2008	110.0	107.6
2009	112.6	107.6
2010	111.7	109.2
2011	112.5	111.2
2012	113.9	111.6
2013	116.2	113.4
2014	117.9	116.2
2015	118.9	116.2
2016	116.3	116.6
2017	117.9	119.0
2018	117.9	118.8

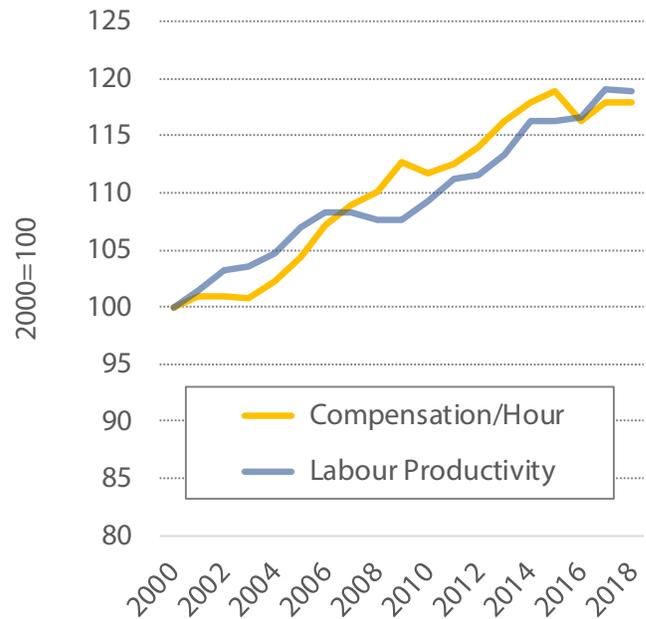
Source: Authors' calculations from data in tables 3 and 4.

Historical productivity performance and the linkage between productivity and real labour income

There has been some recent debate in the economics literature about whether an increasingly smaller share of productivity gains is being passed on to workers with an increasing share being captured by other factors of production.¹⁴

¹⁴ See, for example, Lawrence (2015), Brill, Holman, Morris, Raichoudhary, and Yosif (2017) and Stansbury and Summers (2018).

Figure 5: Indices of Average Annual Compensation per Hour and Labour Productivity



Source: Authors' calculations from data in tables 3 and 4.

It is beyond the scope of this study to weigh in on the debate. Suffice to say that the available evidence for Canada underscores a strong linkage between productivity and wage growth. Most notably, Baldwin, Gu, Macdonald, and Yan (2014) conclude that real hourly labour compensation and labour productivity in Canada are closely related over the relatively long period from 1961 to 2012.

A close relationship between average annual hourly compensation and labour productivity is also suggested by the data reported in table 5 and figure 5. The first column of table 5 provides index values for average annual compensation per hour using data in table 3 with 2000 as a base year (with a value equal to 100), and with each successive year's value calculated as

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the ratio of the average annual hourly compensation in that year to the average annual hourly compensation in 2000. The second column of table 5 reports index values for labour productivity (for all industries in Canada using chained 2012 dollars per hour) with 2000 as the base year and values for subsequent years calculated as the ratio of the given year's value of labour productivity to the value in 2000.¹⁵ The close statistical relationship between the two series in table 5 is underscored by the very high correlation coefficient ($R = 0.949$) between the two indices.

Earlier, we illustrated how a 2 percent per year increase in average hourly compensation would enable Canadian workers to enjoy a somewhat higher real income by 2030 while working only 4 days a week. Given the close link over time between the growth of labour productivity and the growth of real labour income, realizing this outcome implies that labour productivity in Canada would need to grow at around 2 percent per year.

In fact, achieving a 2 percent per annum growth in labour productivity would be a substantial improvement over Canada's recent historical performance. Table 6 reports estimates by Gu and Wilcox (2018) of labour productivity growth rates for Canada's business sector for sub-periods between 1987 and 2016. A 2 percent per annum growth in labour productivity would effectively represent a doubling of the annual growth rate from 2010 to 2016 as reported by Gu and Wilcox (2018), but a more modest approximately 33 percent increase compared to the growth rate from 2010 to 2014.

Table 6: Labour Productivity Growth in Canada's Business Sector

1987 - 2010	2010 - 2014	2010 - 2016
1.30	1.53	1.05

Source: Gu and Wilcox, 2018.

It is important to reiterate that a 2 percent per year increase in labour productivity is broadly consistent with Canada's longer historical experience. Indeed, Baldwin, Gu, Macdonald, and Yan (2014) note that for the entire period from 1961 to 2012, labour productivity in the business sector advanced at a 1.9 percent average annual rate. To be sure, labour productivity grew at a substantially faster rate pre-1980 compared to post-1980. Furthermore, the sub-period from 1988 to 2000 saw the fastest average annual productivity growth rate (around 1.7 percent) post-1979, whereas the average annual growth rate was only about 0.7 percent from 2000 to 2012.

In short, given its recent productivity performance, achieving a 2 percent per annum growth in labour productivity in the years ahead arguably represents a challenging, but potentially achievable, outcome for the Canadian economy. It is beyond the scope of this bulletin to address the potential causes of Canada's recent productivity slowdown or to suggest policies to address the slowdown.¹⁶ Rather, the main point of the bulletin is to highlight the substantial benefits that Canadian workers can realize if the long-run historical productivity

¹⁵ The labour productivity data are from Statistics Canada, 2020d.

¹⁶ Canada is not unique in experiencing a slowdown in labour productivity growth in the past few decades. In particular, Gu and Wilcox (2018) show an even sharper slowdown for the US in recent years.

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growth performance of the Canadian economy can be recaptured.

Concluding comments

Canadian workers obviously want both higher real incomes and increased leisure. The goal of working a 4-day work week while continuing to enjoy substantial increases in real standards of living is both reasonable and realistic. The key to achieving it is for the economy to produce a faster rate of productivity growth in the years ahead than has been realized in recent years. This bulletin illustrates that if Canada's labour productivity growth over approximately the next decade increased from its recent 1 percent per annum value to 2 percent per annum, Canadian workers could, by 2030, enjoy higher real average annual compensation while working only 4 days per week.

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