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TRENDS IN LOW-WAGE EMPLOYMENT IN CANADA: INCIDENCE, GAP AND INTENSITY, 1997-2014

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Abstract

This paper introduces two new concepts to the debate on job quality: the low-wage gap and low-wage intensity. These two measures provide information on the depth and severity of low wages. Using Labour Force Survey microdata, we discuss trends in these two measures, along with trends in the incidence of low wages over the 1997-2014 period. For example, in 2014, 27.6 per cent of all employees aged 20 to 64 years earned less than two-thirds of median hourly wages for full-time workers aged 20 to 64 years (or $16.01 per hour), our low-wage cutoff. In this same year, the low-wage gap was 21.0 per cent, which means that the average low-wage employee earned approximately 79.0 per cent of the low-wage cutoff (or $12.66 per hour). Consequently, low-wage intensity, defined as the product of the incidence and the gap (scaled by 100) was 5.8. This is down from an intensity of 6.3 in 1997, which was the result of a slightly higher incidence (27.9 per cent) and a higher gap (22.7 per cent). This paper also provides these results by gender, age, educational attainment, industry, occupation, employment status and province. These detailed results help identify which groups face the highest rates, greatest depths, and largest intensities of low-wage employment in Canada. Furthermore, this paper explores the implications of a $15 minimum wage on the low-wage gap in 2014. Finally, to provide a brief sensitivity analysis, we discuss (1) the results for low-wage employment in Canada using a different cutoff (two-thirds mean hourly wages for full-time employees aged 25 to 54 years) and (2) comparisons of our results to those of CIBC's Employment Quality Index and the OECD's low-pay data.

Trends in Low-Wage Employment in Canada: Incidence, Gap and Intensity, 1997-2014

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Executive Summary

A number of commentators have argued that job quality in Canada has been declining in recent years. However, job quality is difficult to measure because it is composed of many different aspects, including interpersonal relationships, job content, job difficulty, pensions, promotions, hours of work, and pay. These different dimensions of job quality will likely not move in the same direction, making aggregate indices difficult to interpret. Furthermore, creating an aggregate index for job quality necessitates value judgments concerning the weights that need to be attached to different components of job quality. For this reason, we chose to focus on only one dimension of job quality: hourly pay. It is arguable that this component is one of the most important components of job quality because an individual's labour market earnings are in many cases extremely closely related to their living standards.

We attempt to answer the following questions: how has the incidence of low-wage jobs changed over the 1997-2014 period? How do the incidences of low-wage jobs vary by gender, age, educational attainment, occupation, industry, and employment status? How does the incidence of low-wage jobs vary at the provincial level?

In addition to providing new detailed estimates on low-wage jobs, this report also seeks to introduce two new concepts for measuring low-wage employment, a crucial dimension of job quality. First, we produce estimates of the low-wage gap, which can be intuitively understood to measure the depth of low-wage jobs. It is defined as the difference between average hourly earnings for low-wage individuals and the low-wage cutoff as a proportion of the low-wage cutoff. Second, we generate estimates of low-wage intensity, which is an aggregate index that captures movements in both the incidence of low-wage jobs and the low-wage gap. The intensity of low wages is defined as the product of the low-wage gap and the incidence of low wages, scaled up by 100. To our knowledge, this is the first study to produce estimates of these measures.

Methodology

The estimates that we provide in this paper for the incidence of low-wage jobs, the low-wage gap and the intensity of low wages were created using the Labour Force Survey (LFS) Public Use Microdata Files (PUMF) for the years 1997-2014 inclusive. Briefly, our methodology is as follows. We define low wages as any hourly earnings that fall below two-thirds of median hourly wages for full-time workers aged 20 to 64 years, where full-time is defined as 35 hours or more. This is referred to as the cutoff (or the benchmark). Using this definition, we create a binary low-wage flag, which allows us to calculate the incidence of low-wage jobs for all

employees aged 20 to 64 years and for a variety of different subgroups. Furthermore, this low-wage flag allows us to calculate the low-wage gap. With estimates of both the incidence of low wages and the low-wage gap, we subsequently generate estimates of the intensity of low wages.

Highlights: Low-Wage Landscape in 2014

Slightly more than one in four employees aged 20 to 64 years were considered low-wage in 2014. Furthermore, the hourly wages for this one person were, on average, approximately one half of median hourly wages.

Females had a low-wage incidence that was 1.5 times higher than that of males. In contrast, the low-wage gaps for women and for men were more alike.

Young workers and middle-aged/older workers had a similar dynamic: young worker low-wage incidence was approximately 2.5 times higher than middle-aged worker low-wage incidence and older worker low-wage incidence, while the low-wage gaps for these three groups were much more comparable.

Similar to the observations for gender and age, part-time workers faced a low-wage incidence that was nearly 2.5 times higher than that faced by full-time workers, but their low-wage gap was closer to that of full-time workers.

In contrast, there was a large variation in both the incidence and the gap across occupations and industries.

This suggests that in general, both personal characteristics and job characteristics are important in determining the incidence of low-wage jobs, while job characteristics matter a lot more than personal characteristics in determining the low-wage gap. We also find that personal characteristics do not seem to matter in determining the trend of the incidence and the gap over time, while job characteristics can matter, as short- and long-term movements in certain occupations and industries did not mimic the overall aggregate trends.

Low-Wage Trends

For all employees aged 20 to 64 years, the incidence of low-wage jobs in 2014 was 27.6 per cent, down 0.3 percentage points from 27.9 per cent in 1997 (Table 1). The low-wage gap also declined during this period, from 22.7 per cent in 1997 to 21.0 per cent in 2014. Given that both components of the intensity of low wages decreased, it is not surprising that low-wage intensity declined from 6.3 in 1997 to 5.8 in 2014.

Table 1: Summary of Low-Wage Employment Results

	1997	2008	2014	Δ(1997-2008)	Δ(2008-2014)	Δ(1997-2014)
All Employees (20-64)						
Incidence	27.9	24.5	27.6	-3.4	3.1	-0.3
Gap	22.7	23.4	21.0	0.7	-2.4	-1.7
Intensity	6.3	5.7	5.8	-0.6	0.1	-0.5
Gender						
Incidence						
Female	35.3	30.7	32.8	-4.6	2.1	-2.5
Male	21.2	18.5	22.3	-2.7	3.8	1.1
Gap						
Female	23.5	24.1	21.7	0.6	-2.4	-1.8
Male	21.5	22.3	19.9	0.8	-2.4	-1.6
Intensity						
Female	8.3	7.4	7.1	-0.9	-0.3	-1.2
Male	4.6	4.1	4.4	-0.5	0.3	-0.2
Age						
Incidence						
20-29	49.4	41.0	47.5	-8.4	6.5	-1.9
30-49	20.7	18.5	20.4	-2.2	1.9	-0.3
50-64	21.0	21.1	23.0	0.1	1.9	2.0
Gap						
20-29	23.9	24.5	22.1	0.6	-2.4	-1.8
30-49	21.6	22.5	20.0	0.9	-2.5	-1.6
50-64	22.3	23.2	20.3	0.9	-2.9	-2.0
Intensity						
20-29	11.8	10.0	10.5	-1.8	0.5	-1.3
30-49	4.5	4.2	4.1	-0.3	-0.1	-0.4
50-64	4.7	4.9	4.7	0.2	-0.2	0.0
Employment Status (FT/PT)						
Incidence						
Full-Time	21.8	19.1	21.0	-2.7	1.9	-0.8
Part-Time	50.5	45.7	51.3	-4.8	5.6	0.8
Gap						
Full-Time	21.1	21.6	19.0	0.5	-2.6	-2.1
Part-Time	25.3	26.4	23.9	1.1	-2.6	-1.4
Intensity						
Full-Time	4.6	4.1	4.0	-0.5	-0.1	-0.6
Part-Time	12.8	12.1	12.3	-0.7	0.2	-0.5

Source: CSLS calculations.

The first subgroup we consider is gender:

- Over time, the incidence of low wages fell for female employees aged 20 to 64 years from 35.3 per cent in 1997 to 32.8 per cent in 2014. The low-wage gap also fell for female employees during this time period from 23.5 per cent to 21.7 per cent. This resulted in an overall decline in the intensity of low wages from 8.3 in 1997 to 7.1 in 2014.
- Male employees aged 20 to 64 years saw their incidence of low-wage jobs increase from 21.2 per cent to 22.3 per cent between 1997 and 2014. Their

low-wage gap, however, declined from 21.5 per cent to 19.9 per cent over this same time frame. As a result, the intensity of low-wage jobs for males declined from 4.6 in 1997 to 4.4 in 2014. This decline was substantially less than the decline seen among women.

We also consider low-wage trends by age:

- Over the 1997-2014 period, the incidence of low-wage jobs among young employees (age 20 to 29 years) declined from 49.4 per cent to 47.5 per cent. The low-wage gap also declined during this period, from 23.9 per cent to 22.1 per cent, resulting in a large fall in the intensity of low wages: 11.8 in 1997 versus 10.5 in 2014.
- Middle-aged employees (aged 30 to 49 years) saw a mild decrease in their incidence of low wages between 1997 and 2014 from 20.7 per cent to 20.4 per cent. This group also saw their low-wage gap decline by a small margin: 21.6 per cent in 1997 to 20.0 per cent in 2014. These trends caused a small decrease in the intensity of low-wage jobs among employees aged 30 to 49 years from 4.5 in 1997 to 4.1 in 2014.
- Older workers (aged 50 to 64 years) saw an increase in their low-wage incidence over this time period (21.0 per cent in 1997 to 23.0 per cent in 2014). Simultaneously, the low-wage gap for older workers declined sharply from 22.3 per cent to 20.3 per cent. These movements over time resulted in no change in the intensity of low-wage jobs among this age group (4.7 in 1997 and 4.7 in 2014).

In addition to age and gender, we consider low-wage jobs by educational attainment:

- Every educational attainment category saw an increase in its incidence of low wages over the 1997-2014 period. Employees with 0 to 8 years of schooling had the highest incidence of low wages in all years. In 2014, 50.7 per cent of this group had low-wages, up from 44.6 per cent in 1997. Employees with a Master's or a Doctorate degree had the lowest incidence of low-wage jobs in every year at 7.7 per cent in 1997 and 12.4 per cent in 2014.
- At first glance, it might seem odd that every category of educational attainment saw an increase in its incidence of low wages over this period, while the incidence of low wages at the aggregate level declined. This observation can be explained by the compositional shift in the population away from lower levels of educational attainment toward higher levels of educational attainment. In particular, the share of employees aged 20 to 64 years with a university degree increased from 19.2 per cent in 1997 to 28.7 per cent in 2014.
- The low-wage gap for all categories of educational attainment was extremely similar. In 2014, the lowest low-wage gap was 19.8 per cent for employees with post-secondary certificates or diplomas, while the highest low-wage gap was 23.2 per cent for employees with 0 to 8 years of schooling. Between 1997 and 2014, all levels of educational attainment, except the Master's or Doctorate level, saw their low-wage gaps decline.

Obviously, higher levels of educational attainment lead to lower low-wage job intensities. However, these results show that, over the 1997-2014 period, at every level of educational attainment, there was a general increase in the incidence of low-wage jobs, although this increase was offset by slight decreases in the low-wage gap for most levels of educational attainment. In a recent *New York Times* article, it was suggested that the American economy is not producing enough jobs that require college degrees. These observations may also explain why there has been an increase in the incidence of low wages in Canada, even at higher levels of educational attainment.

We also consider low-wage conditions by employment status:

- In 2014, 21.0 per cent of full-time employees had low wages, down from 21.8 per cent in 1997. The average wage for individuals with low wages was 81.0 per cent of the benchmark in 2014, resulting in a low-wage gap of 19.0 per cent. This represented a 2.1 percentage point decline from a low-wage gap of 21.1 per cent in 1997. These two downward trends resulted in a decline in the intensity of low wages from 4.6 to 4.0 over the 1997-2014 period.
- There was a much larger share of part-time employees with low wages in 2014 (51.3 per cent). This was higher than the incidence of low wages for this group in 1997. The low-wage gap for part-time employees, however, declined over the 1997-2014 period from 25.3 per cent to 23.9 per cent. This decline offset the increase in the incidence of low wages, so the intensity of low-wage jobs declined between 1997 and 2014 from 12.8 to 12.3.

It is not surprising that full-time workers had better job conditions than part-time workers given that part-time employees are more likely to earn the minimum wage (which was only $10.40 in 2014, significantly below the cutoff) than full-time employees. Nevertheless, both full-time and part-time employees saw improvements in their low-wage job conditions from 1997 to 2014.

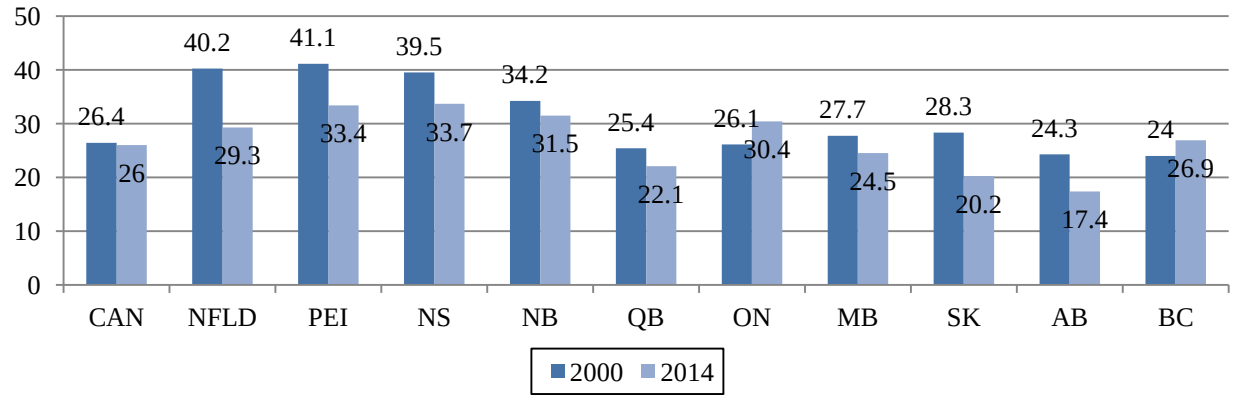
Since labour market experiences across Canada are extremely divergent, we chose to explore differences in low-wage employment measures across provinces. The key highlights are below.

- Alberta had the lowest incidence of low-wage jobs (17.4 per cent) in 2014, while Nova Scotia had the highest incidence (33.7 per cent) (Chart 1). The lowest low-wage gap was seen in Prince Edward Island at 18.6 per cent, while the highest low-wage gap was seen in Ontario at 24.1 per cent (Chart 2).
- Since Ontario's low-wage gap was exceptionally high, it is not surprising that it had the highest low-wage intensity in 2014 (7.3). Since Alberta's incidence of low wages was so low in 2014, it is also not surprising that it had the lowest low-wage intensity (3.5).
- Over the 2000-2014 period, two provinces saw increases in their incidences of low wages (Ontario and British Columbia), while three provinces saw increases in their low-wage gaps (Ontario, Alberta and Saskatchewan).

One major innovative approach that we introduce is a cost-of-living adjustment to reflect the massive differences in prices across Canada. We find that:

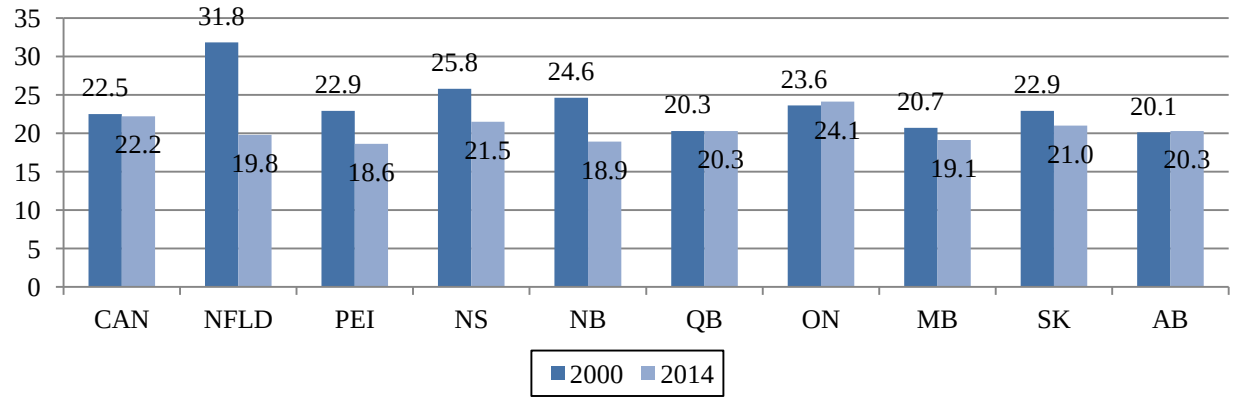
- Ontario and British Columbia were the only two provinces to see their low-wage intensities revised upward after price adjustment. This is not surprising given that these are the only two provinces whose inter-city price indices, used for the adjustment process, were above 100 (103 in British Columbia and 106 in Ontario).
- The upward revision in the intensity of low wages in British Columbia and Ontario is the result of an upward revision in their incidence and in their gap. No other province saw an upward revision in its incidence of low wages, while three other provinces saw an upward revision in their low-wage gaps after price adjustment (Alberta, Saskatchewan and Nova Scotia).

Chart 1: Incidence of Low Wages, Canadian Provinces after Cost-of-Living Adjustment, 2000 and 2014



Source: CSLS calculations.

Chart 2: Low-Wage Gap by Province (20-64), Canada after Cost-of-Living Adjustment, 2000 and 2014



Source: CSLS calculations.

This report also investigates the impact of increasing minimum wages to $15 per hour on the low-wage gap. We find that increasing the minimum wage to $15 per hour would decrease the low-wage gap from 21.0 per cent to 5.8 per cent in 2014 because 88.2 per cent of low-wage employees aged 20 to 64 years earned less than $15 per hour in 2014. Since the intensity of low wages is the product of the incidence of low wages and the low-wage gap, we would also see a massive decline in the intensity of low wages (5.8 to 1.6).

In this report, we also explore the sensitivity of our results to the use of an alternative cutoff (i.e. two-thirds of mean hourly wages for full-time employees aged 25 to 54 years) and compare our estimates to the Employment Quality Index (EQI) produced by CIBC and the low-pay data produced by the OECD. We find that our numbers show very different trends than the CIBC EQI, which was 4.6 per cent lower in 1997 than in 2014 (to be interpreted as deterioration), while our estimates of job quality (incidence, gap and intensity) showed a 1.1 per cent, 7.5 per cent and 8.5 per cent decrease (to be interpreted as improvements). We also find that the OECD data for the incidence of low pay had long-run trends similar to those in our estimates of low wages. There were slight differences on an annual basis, but this was purely the result of a different coverage and a different universe, since the OECD also uses the definition of two-thirds of median earnings.

In summary, we find that the low-wage jobs landscape has improved over the 1997-2014 period. We also find that there are important differences between key subgroups (male/female, part-time/full-time, young/middle-aged/old) in terms of their incidences of low wages, but that their low-wage gaps are strikingly similar. This is likely driven by the fact that within the low-wage category an individual's socio-economic profile is less significant in determining hourly earnings than it is outside of the low-wage category.

Trends in Low-Wage Employment in Canada: Incidence, Gap and Intensity, 1997-2014[1]

It has been argued recently that the economy is creating a disproportionate number of low quality jobs. For example, CIBC's Employment Quality Index (EQI) shows that "employment quality has been on a clear downward trajectory over the past 25 years" (CIBC, 2015:1). In addition, the Law Commission of Ontario (2012) reported that 22 per cent of jobs in Ontario were considered precarious (defined as those jobs which combine low rates of pay with part-time or highly variable hours of work, and no benefits or pensions), while four out of five jobs added to the labour market since the recession in Canada have been temporary or contract work. This argument is not new. Lacharite (2002) found that increases in part-time and casual employment were dominating employment growth in the late-twentieth and early-twenty-first centuries. The enduring and perhaps increasing presence of low-quality jobs was also noted by Foster (2012) who suggested that youth unemployment and underemployment in Canada could be more than just a temporary problem. Clearly, there have been many attempts to define and measure job quality.[2]

Despite the growing interest in the measurement of job quality around the world and a number of specific investigations into job quality in Canada, there has been a dearth of detailed data and analysis for Canada as a whole and for all Canadian provinces. To fill this void, this report provides a detailed analysis of the trends in job quality in Canada between 1997 and 2014, where job quality is defined as low pay, a crucial dimension of job quality.[3]

To do so, we provide detailed estimates for three concepts of low-wage employment, two of which are new measures that, to our knowledge, have not been previously studied or presented in the literature.[4] First, we provide estimates of the incidence of low wages, a very common measure of low-wage employment, which shows the share of a given population that earns below some specified cutoff. Second, we show results for the low-wage gap, which measures the extent to which the wage of low-wage workers is below the cutoff. This is one of the new measures. It is defined as the difference between average hourly earnings of low-wage workers and the low-

[1] This paper was written by CSLS economist Jasmin Thomas under the supervision of CSLS Executive Director Andrew Sharpe. The author would like to thank CSLS economists Matthew Calver and Alexander Murray, and Bert Waslander for comments. This paper was presented by Jasmin Thomas at the 50th Annual Meeting of the Canadian Economics Association at the University of Ottawa in Ottawa, Ontario on June 4, 2016. The author would like to thank Gordon Betcherman for the comments he provided after the presentation.

[2] Green (2015:1215) shows that "good jobs do exist—that the labour market does not just function according to a Roy model with wage differentials reflecting only skill differentials, compensating differentials or bond posting."

[3] This paper builds on work the Centre for the Study of Living Standards did as part of an international project on job quality headed by David Howell at the Milano School of International Affairs, Management, and Urban Policy at The New School in New York. The CSLS was responsible for generating estimates for Canada and Australia as part of this larger study.

[4] These estimates are also available in the CSLS low-wage jobs database, accessible at www.csls.ca/data/low-wagejobs.xlsx.

wage cutoff as a proportion of the low-wage cutoff. Second, we provide estimates of low-wage intensity. This is the second new measure. This aggregate measure captures movements in both the incidence of low-wage jobs and the low-wage gap. The intensity of low wages is defined as the product of the low-wage gap and the incidence of low wages, scaled up by 100.

Even though we restrict our attention to low hourly earnings in this report, we recognize the importance of many of the other dimensions of job quality and are aware that our measure falls far short of accurately capturing the full extent of the objective and subjective measures of job quality in Canada. Other job characteristics that contribute to job quality that are not discussed in this report include hours of work (both overwork and underwork), future prospects (promotion), job security, job content (interest, prestige, and independence), and the potential for interpersonal relationships, among others (Clark, 1998:1).

The report is structured as follows. The first section describes the data sources. The second section describes the methodology. The third section reviews the results for the 1997-2014 period for the incidence of low-wage jobs, as well as the low-wage gap and low-wage intensity, measures that parallel the poverty gap and poverty intensity in the Index of Economic Well-Being produced by the CSLS (e.g. Thomas and Uguccioni, 2016). The results are broken down by age, gender, educational attainment, industry, occupation, and employment status.

The fourth section presents the estimates for low-wage jobs in Canada at the provincial level. The fifth section reviews the implications for the low-wage gap of increasing the minimum wage to $15 per hour. The sixth section provides a sensitivity analysis, which investigates how the results for low-wage jobs are affected by the use of an alternative cutoff. The seventh section compares our results with other measures of job quality, including CIBC's Employment Quality Index and the OECD's official low-wage data. The eighth section concludes.

I. Data Sources

This report provides estimates that were constructed using the Labour Force Survey (LFS) Public Use Microdata Files (PUMF). The data in the LFS PUMF are based on the LFS, a monthly survey of approximately 56,000 households in Canada, resulting in labour market information for approximately 100,000 individuals. The LFS PUMF data are available on a monthly basis. When properly weighted, these observations measure conditions of the entire population.[5]

Other data sources have been used to measure job quality, such as data collected through censuses and the 2011 National Household Survey (NHS), or the Survey of Labour and Income Dynamics (SLID), now the Canadian Income Survey (CIS). In this report, we chose to use the LFS because the results are available on a more frequent and up-to-date basis than those of past censuses and the 2011 NHS, and in contrast to the CIS, the LFS provides data on hourly earnings.

[5] The estimates in this report do not include coefficients of variation or confidence intervals. Some of the small differences both over time and across groups may not actually be statistically significant differences.

It is important to note that there are differences between the LFS and the other surveys mentioned above. First, the CIS includes information on other sources of income, such as government transfers and employment insurance, while the LFS only includes information on labour market earnings. Second, the 2011 NHS and past censuses contain much more detailed geographic, social and demographic information than the LFS. For example, in contrast to the microdata files for the 2011 NHS and the past censuses, the LFS PUMF does not contain categorical variables for immigrant status or Aboriginal status (although these variables are reported in the LFS).

This report also uses Statistics Canada data on the Consumer Price Index (CPI) to convert nominal hourly wages into real 2014 dollars, as well as data on inter-city price levels to adjust hourly wages according to the relative cost-of-living across Canada.

II. Methodology

There are three measures of job quality in this report, all of which focus on low-wages. The first measure is the incidence of low wages, defined as the share of individuals with hourly wages below two-thirds of median hourly wages. Aside from using a different universe, this cutoff corresponds to the OECD's definition of low pay. The second measure is the low-wage gap, which can be interpreted as the depth of low wages. It is defined as the difference between the average wage of low-wage workers and the benchmark. For clarity, it is reported as a share of the cutoff. The third measure is low-wage intensity, defined as the product of the low-wage gap and the incidence of low wages.

A. Incidence

Using the LFS PUMF, we calculated a low-wage cutoff (or benchmark) for each year between 1997 and 2014, defined as two-thirds of median hourly wages of full-time (35 or more hours) employees aged 20 to 64 years.[6] It is important to point out that the cutoff is an annual cutoff; it is not a moving average. Furthermore, the cutoff is determined at the national level, not at the local level or for individual subgroups.[7] Finally, this cutoff is a relative measure of low-wages, not an absolute measure of low-wages.

Once the cutoff was determined, it was possible to create a low-wage flag, which identified each observation in the dataset as low-wage based on whether that individual's wage was equal to or less than the cutoff. This binary variable allowed us to quickly and easily calculate the incidence of low-wage jobs.[8]

[6] Our definition of full-time employment, 35 hours or more, does not correspond with the definition used by Statistics Canada, 30 hours or more. This definition of full-time employment was also used by David Howell from The New School in New York for his international study of job quality (Howell, 2016).

[7] The national cutoff and the aggregate measures of low-wage jobs are not cost-of-living adjusted, unless otherwise specified.

[8] Our results were developed quarterly and converted into annual averages.

To ensure that the incidence of low-wage jobs was not overly sensitive to the choice of cutoff, we created estimates based on an alternative cutoff, namely two-thirds of mean hourly wages for full-time (35 hours or more) employees aged 25 to 54 years.

To ensure that we provide adequate details, we performed the calculations at the aggregate level (i.e. all employees aged 20 to 64 years), and for employees aged 20 to 64 years by age, gender, educational attainment, industry of main employment, occupation of main employment, and employment status (i.e. full-time or part-time).[9] We also perform these calculations at the provincial level.[10]

To adjust for differences in the cost-of-living across Canada, we used inter-city price levels provided by Statistics Canada to adjust hourly wages at the provincial level. It is important to note that we applied the inter-city price indices to the entire province, which in most cases will result in an overestimation of the price level: urban centres tend to have higher prices than rural areas, especially for housing and shelter costs. However, there is no other official measure of relative price differences by province, so this adjustment was the most appropriate. For transparency, we will discuss the impact of the adjustment on provincial results.

B. Gap

The depth of low-wage employment can be examined using the low-wage gap. This measure is calculated as the difference between the average hourly wages of low-wage employees and the low-wage cutoff, divided by the low-wage cutoff, and multiplied by 100. In an equation, this is represented as follows:

$$\left(\frac{C - LW}{C}\right) * 100$$

where C is the low-wage cutoff and LW is the average hourly wages of low-wage employees.

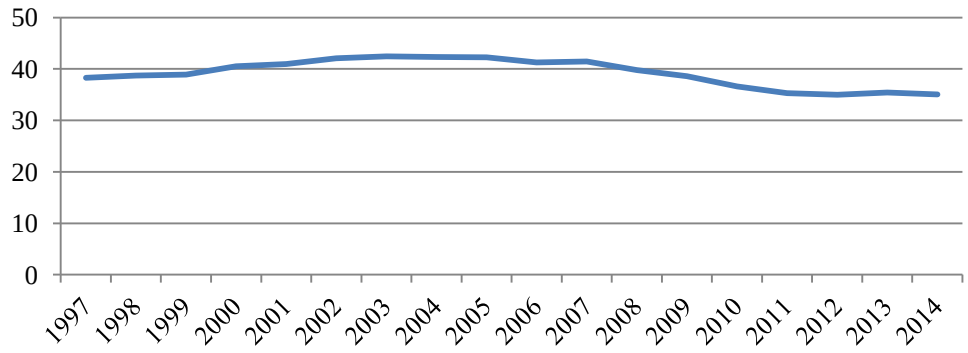
It is important to point out that the low-wage gap has an implicit maximum due to minimum wage legislation. This is because it is illegal to pay employees below the minimum wage in Canada. Hence, minimum wages act as a floor below which hourly wages cannot fall, and subsequently, average hourly wages for all low-wage employees also cannot fall below this level.

For example, suppose that every single person below the cutoff in 2014 earned the national minimum wage of $10.40 per hour (a weighted average of provincial minimum wages). In this case, the low-wage gap would have been 35.0 per cent. This implies that 35.0 per cent is the maximum low-wage gap that can legally be attained in Canada. This maximum changes as the benchmark cutoff and the minimum wage change (Chart 3).

[9] In the Labour Force Survey microdata file, the variable for hourly earnings corresponds to each individual's main job. This may lead to a slight margin of error in the hourly wages for multiple job holders, especially if an individual's main job has a lower hourly wage than their secondary or tertiary job. Fortunately, in 2014, there were only 712,297 multiple job holders among employees aged 20 to 64 years, or only 5.1 per cent of the 13,894,199 employees in this age group. Hence, this issue is likely to represent only a small error.

[10] The estimates were generated using Stata. The code can be made available upon request.

Chart 3: Maximum Possible Low-Wage Gap, Canada, Per Cent, 1997-2014



Source: CSLS calculations based on Chart 4.

C. Intensity

In the Index of Economic Well-Being (IEWB) produced by the Centre for the Study of Living Standards, there is a measure of poverty intensity, calculated as the product of the poverty rate and the poverty gap. It is a simple way of aggregating both the incidence and the depth of poverty into a single measure. This method was pioneered by Osberg and Xu (1999). In this paper, we have applied this concept of intensity to low wages. We believe that this is the first time in the literature that this concept has been used for low-wage employment. We calculated low-wage intensity as the product of the incidence of low wages and the low-wage gap, scaled up by 100.

III. Trends in Low-Wage Jobs in Canada

This section reviews trends relating to low-wage jobs (one dimension of job quality) in Canada between 1997 and 2014. Before presenting the results, it is useful to review trends in the benchmark and the minimum wage.

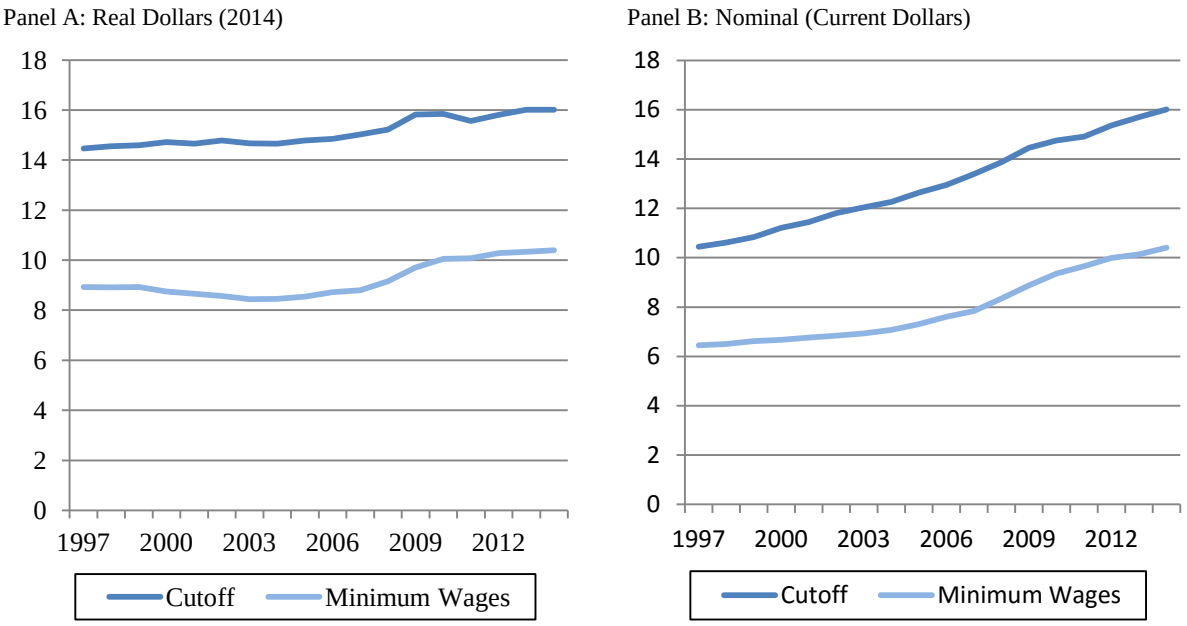
Chart 4 shows the benchmark used to calculate the incidence of low-wage jobs and the low-wage gap. Over the 1997-2014 period, the benchmark has increased 10.7 per cent from $14.47 per hour to $16.01 per hour in 2014 dollars. The majority of this growth occurred between 1997 and 2009 when the benchmark reached $15.82 per hour. Since the benchmark is simply two-thirds of median hourly wages for full-time workers aged 20 to 64 years, this increase in the benchmark also represents a comparable increase in the median hourly wages of full-time workers aged 20 to 64 years.

Minimum wages in Canada are legislated provincially, which makes comparisons with the cutoff quite difficult.[11] The OECD, however, has created a measure for Canada as a whole that is based on provincial minimum wages which we have converted into constant 2014 dollars

[11] There is a federal minimum wage in Canada but only a small fraction of the total population is subject to this minimum wage.

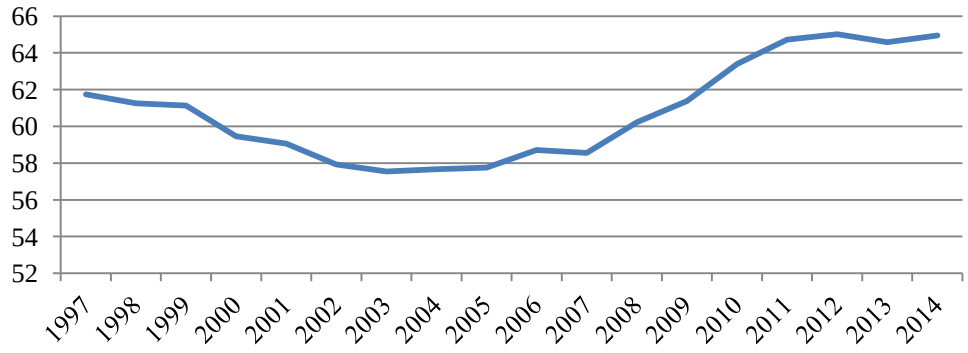
using the Consumer Price Index (CPI).[12] According to Chart 4, minimum wages in Canada actually dipped slightly in real terms between 1997 and 2007, falling from $8.91 to $8.80 per hour. This period of mild decline was followed by a large increase to $10.05 per hour over the 2007-2010 period. During the following four years, minimum wages continued to rise, but at a much slower pace, reaching $10.40 per hour by 2014.

Chart 4: Cutoffs for Low-Wage Employment and Minimum Wages, Canada, 1997-2014



Note: median wages are 1.5 times the cutoff by definition.
Source: CSLS calculations for cutoff and OECD for minimum wages converted to 2014 dollars using the CPI.

Chart 5: Minimum Wage as a Proportion of the Cutoff, Canada, Per Cent, 1997-2014



Source: CSLS calculations based on Chart 4.

[12] The OECD national minimum wages were created by weighting each province's legislated minimum wage by its respective share of the Canadian labour force. The calculations were performed on a monthly basis. The underlying data can be provided upon request.

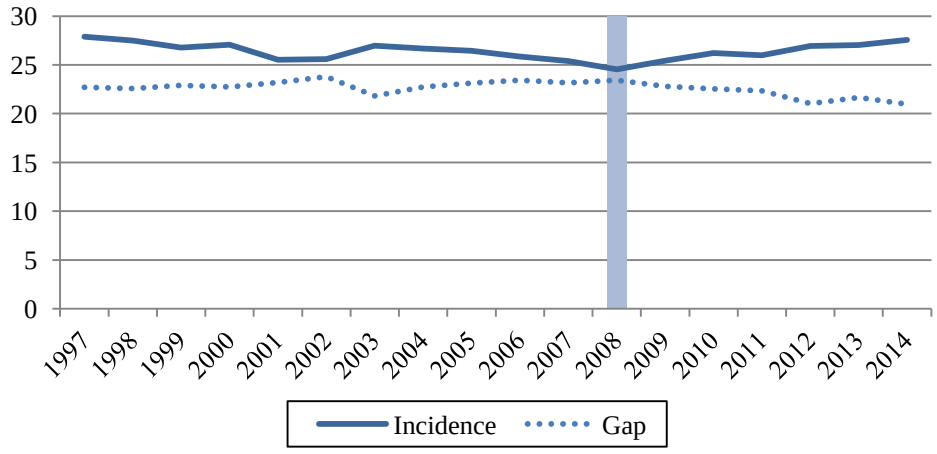
Over the 1997-2014 period, Chart 4 shows that minimum wages were consistently below the benchmark of two-thirds of median hourly wages for full-time employees aged 20 to 64 years. The minimum wage as a proportion of the cutoff, however, was larger in 2014 (64.9 per cent) than in 1997 (61.7 per cent) (Chart 5), showing a rapid increase of 6.2 percentage points between 2007 and 2011.

A. All Employees

i. Incidence

The incidence of low-wage jobs among all employees aged 20 to 64 years was 27.6 per cent in 2014 (Chart 6),[13] down slightly from 27.9 per cent in 1997.[14] Overall, the incidence of low-wage jobs declined 3.4 percentage points between 1997 and 2008 to a trough of 24.5 per cent in 2008 and then increased from 2008 to 2014 by 3.0 percentage points. In other words, prior to the Great Recession, the incidence of low-wage jobs was in decline, while the incidence of low-wage jobs has risen steadily since 2008. This may reflect the relatively slow growth of the Canadian economy in recent years.

Chart 6: Low-Wage Incidence and Gap, Employees (20-64), Canada, 1997-2014



Source: CSLS calculations based on Statistics Canada LFS microdata.

[13] The incidence is, of course, sensitive to the choice of cutoff and a moving-average formula may be employed instead of single-year observations. When there is an upward trend in median wages, the moving-average will be below the actual single-year observation, so the cutoff will be lower, and hence, the incidence of low-wages will be lower. The opposite occurs when the trend in median wages is downward. As pointed out by Lars Osberg, using a five-year moving average alters the benchmark cutoff in 2014 from $16.01 per hour to $15.81 per hour. This decreases the incidence of low-wages from 27.6 per cent to 25.6 per cent. In every year between 2002 and 2014, using five-year averages would decrease the benchmark cutoff by an average of $0.29 per hour. The largest decline occurs in 2009, when the benchmark cutoff changes by $0.91 per hour.

[14] It appears that in the long run, the incidence and the gap are very stable, which suggests that the shape of the bottom half of the wage distribution in Canada doesn't change much over time.

ii. Gap

Chart 6 shows that the low-wage gap decreased in Canada over the 1997-2014 period from 22.7 per cent to 21.0 per cent. Between 1997 and 2014, the low-wage gap fluctuated from a high of 23.8 per cent in 2002 to a low of 21.0 per cent in 2012 and 2014.

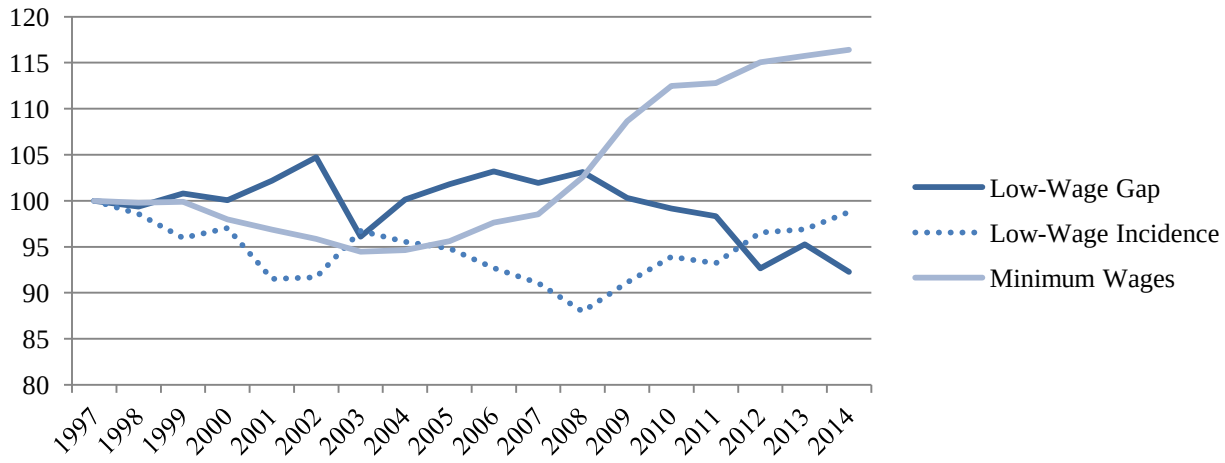
It is interesting to note that between 1997 and 2008, while the incidence of low wages was falling by 12.0 per cent, the gap increased only mildly (3.1 per cent). Since 2008, the incidence has risen by 12.3 per cent, while the gap has fallen by 10.5 per cent. In other words, the relationship between the gap and the incidence of low wages seem to be more strongly linked after the Great Recession.

It is possible that changes in the gap could be driven by changes in minimum wages. For example, over the 1997-2008 period, minimum wages were relatively stagnant, increasing by a mere 23 cents per hour, while over the 2008-2014 period minimum wages saw an increase of $1.24 per hour. Furthermore, a simple exercise shows that the level of the low-wage gap and the real minimum wage have a correlation coefficient of negative 0.69; this is quite a strong correlation.

This relationship can also be seen in Chart 7, where the incidence, low-wage gap and real minimum wages have been indexed to 100 in 1997 to more clearly show variation in the data. In particular, over the 1997-2008 period, both the low-wage gap and the real minimum wage saw almost no change (increasing by 3.1 per cent and 2.6 per cent respectively). This relationship also appears to be strong since 2008, as real minimum wages increased by 13.5 per cent, while the low-wage gap decreased by 10.5 per cent. This suggests that for sustained long-term decreases in the low-wage gap, it is helpful to increase the real minimum wage.[15] It also suggests that it is important to keep track of the low-wage gap to monitor the effectiveness of higher real minimum wages on low-wage workers.

[15] It is interesting to note that there are 524,801 employees aged 20 to 64 years earning below the national minimum wage. On a subnational basis, there are 513,766 employees aged 20 to 64 years earning below their respective provincially legislated minimum wages.

Chart 7: Low-Wage Gap, Low-Wage Incidence and Real Minimum Wages, Canada, 1997=100, 1997-2014



Source: CSLS calculations.

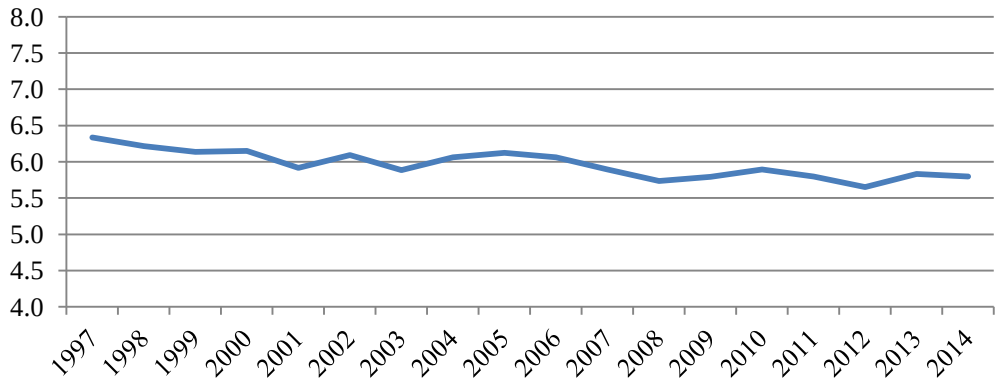
In recent years in Canada, temporary foreign workers have received a lot of media attention. It has been suggested that temporary foreign workers are increasing the labour supply, and thereby depressing wages. However, it is extremely unlikely that this could have a large impact on the overall Canadian labour force and the incidence of low-wage jobs. In 2014, there were a total of only 94,109 temporary foreign workers in Canada (CIC, 2014). This represented only 0.7 per cent of all employees aged 20 to 64 years. Furthermore, assuming that all temporary foreign workers earn low-wages (very unlikely), temporary foreign workers represented only 2.5 per cent of all low-wage employees. Hence, there is very little evidence to suggest that temporary foreign workers could severely depress wages through increased labour supply, thereby increasing the low-wage gap.[16]

iii. Intensity

Over the 1997-2014 period, low-wage intensity, defined as the product of the incidence and the gap, declined from 6.3 to 5.8, the result of declines in the low-wage gap and the very small fall in the incidence of low wages (Chart 8). This is a very modest decline. The lowest intensity was seen in 2012 at 5.6. Since there was very little year-over-year change in either the low-wage gap or the incidence of low wages, and these changes are negatively correlated (to be discussed in the next section), it is not surprising that there is very little year-over-year change in the intensity of low wages.

[16] This is not to deny that massive increases in the number of temporary foreign workers in small centres could be disruptive.

Chart 8: Low-Wage Intensity (20-64), Canada, 1997-2014

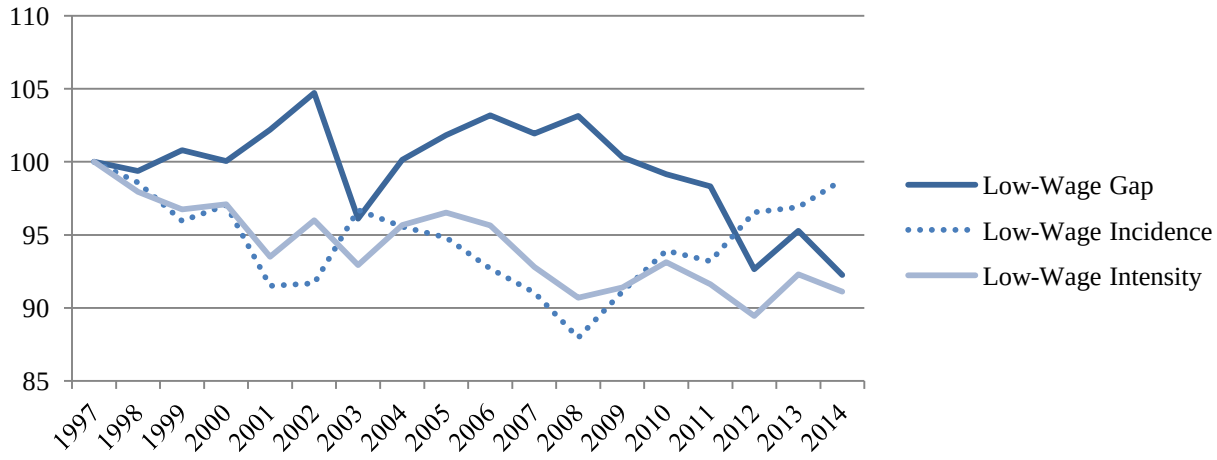


Source: CSLS calculations.

iv. Relationship between the Incidence of Low Wages and Low-Wage Gap

Chart 9 shows that the incidence of low wages and the low-wage gap tend to move in opposite directions on a year-over-year basis. This is not surprising, since individuals who are on the margin of low-wages will increase the incidence of low wages if they fall into low-wage territory, while they will simultaneously boost the average of hourly wages of low-wage individuals, and thus reduce the low-wage gap. In years in which these marginal individuals move above the low-wage cutoff, they will decrease the incidence of low wages, but the average hourly wages of low-wage individuals will subsequently be reduced, and thereby the low-wage gap will increase.

Chart 9: CSLS Low-Wage Incidence, Low-Wage Gap and Low-Wage Intensity, 1997=100, 1997-2014

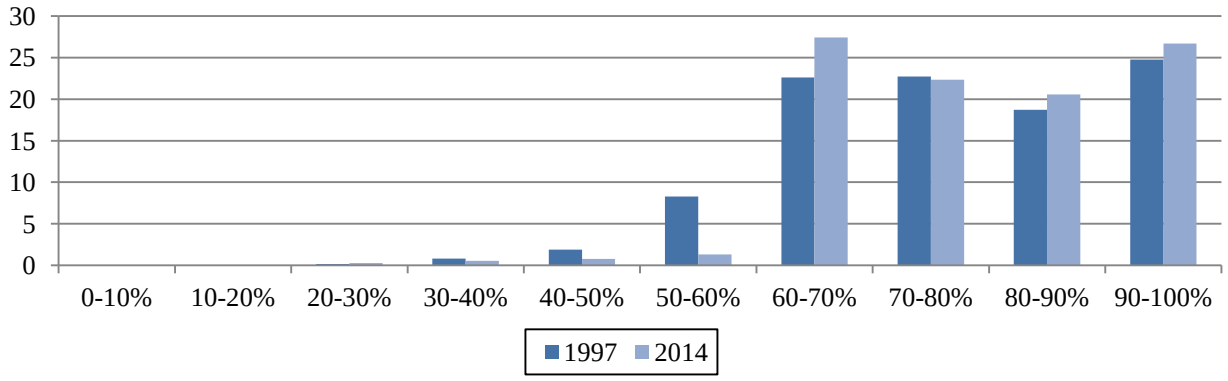


Source: CSLS calculations.

It is important to point out that this relationship arises partly because of the fact that the low-wage gap is a function of the distribution of low-wage workers. The greater the proportion of low-wage workers in the wage group that is closest to the cutoff, the lower the low-wage gap, *ceteris paribus*. An influx of persons into the wage group closest to the cutoff from outside of the low-wage group would raise the weight of this group, and lower the low-wage gap, but also

simultaneously increase the low-wage incidence, as noted above. Chart 10 shows the distribution of low-wage workers in 1997 and 2014.[17] This charts shows that there was a larger share of low-wage workers within 20 per cent of the low-wage cutoff in 2014 than in 1997.

Chart 10: Distribution of Low-Wage Workers, 10 Bins of Widths Equal to 10% of the Low-Wage Cutoff, 1997 and 2014



Source: CSLS calculations.

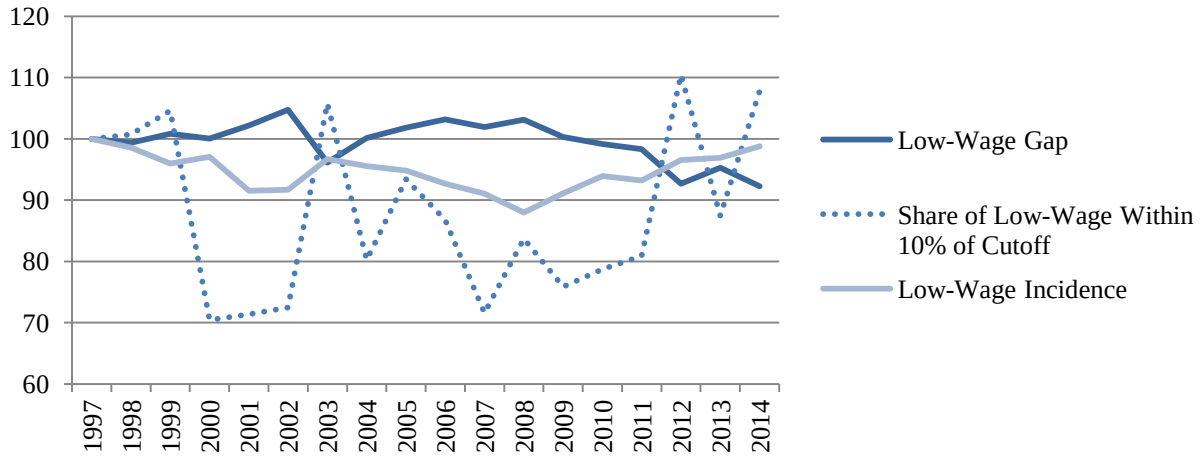
Chart 11 presents the share of low-wage workers within 10 per cent of the cutoff, the low-wage gap and the incidence of low wages, indexed to 100 in 1997 to highlight the differences in more detail and provide some insight into the relationship between the low-wage gap and the incidence of low wages.

This charts shows that, in general, in years when the share of the low-wage workers within 10 per cent of the cutoff increased, the low-wage gap decreased. Simple correlation exercises show a strong negative correlation between the year-over-year changes in the share of low-wage workers within 10 per cent of the cutoff and the low-wage gap (correlation coefficient of 0.64), as well as between the absolute value of the low-wage gap and the share of low-wage workers within ten 10 per cent of the cutoff (correlation coefficient of 0.63)

Chart 11 also shows that, generally, the incidence of low-wage jobs increased in tandem with increases in the share of low-wage workers within 10 per cent of the cutoff. Correlation coefficients suggest that this relationship is quite strong for the absolute levels, but it is slightly weaker for the year-over-year changes. In particular, we find that the incidence of low-wage jobs and the share of low-wage workers within 10 per cent of the cutoff have a correlation coefficient of 0.65, while the year-over-year changes in these two variables have a correlation coefficient of 0.36.

[17] The CSLS low-wage database provides this distribution for 1997-2014.

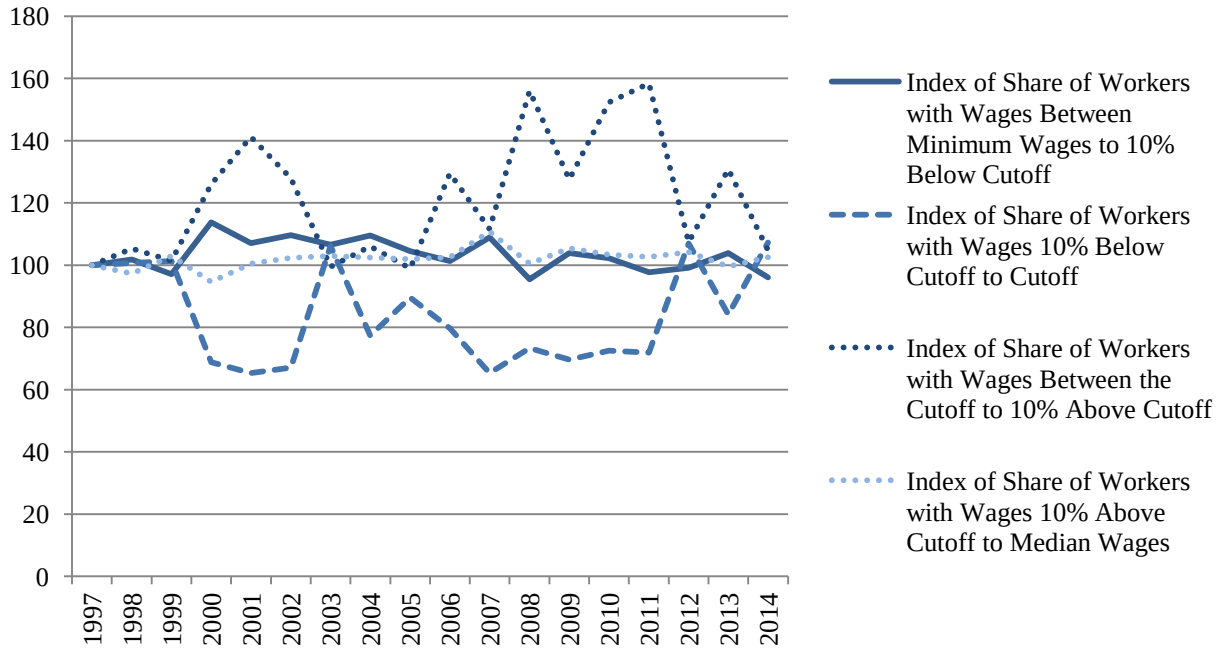
Chart 11: Share of Low-Wage Workers within 10 Per Cent of Cutoff, the Incidence of Low Wages and Low-Wage Gap, 1997=100, 1997-2014



Source: CSLS calculations.

Another way to exhibit the importance of the marginal individual for determining changes in the low-wage gap and the incidence of low wages is to observe changes in the distribution of employees around the cutoff (Chart 12). This charts shows that there is a very strong link between the share of all employees aged 20 to 64 years within 10 per cent below the cutoff and 10 per cent above the cutoff.

Chart 12: Distribution near the Cutoff, Employees (20-64), Canada, 1997=100, 1997-2014



Source: CSLS calculations.

These observations help provide some evidence behind the suggestion that it is marginal individuals that are driving changes in the low-wage gap and the incidence of low wages,

assuming that increases and decreases in the share of low-wage workers within the 10 per cent cutoff are entirely driven by individuals entering and leaving low-wage territory. Unfortunately, without longitudinal data, it is not possible to confirm that this is the main driver behind the negative relationship between the incidence of low wages and the low-wage gap.

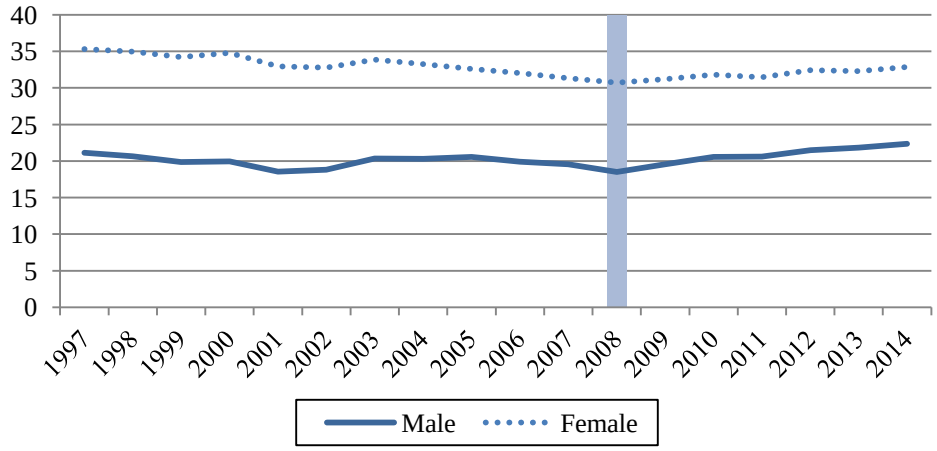
B. Gender

i. Incidence

In 2014, females had a low-wage incidence of 32.8 per cent, while males had a low-wage incidence of 22.3 per cent. This higher incidence of low-wage jobs for females relative to males held over the entire 1997-2014 period, but the gap between males and females declined from 14.2 percentage points in 1997 to 10.5 percentage points in 2014. This was driven by a 1.2 percentage point increase in the incidence of low-wage jobs among males and a 2.5 percentage point decline in the incidence of low-wage jobs among females. These changes caused female low-wage incidence relative to male low-wage incidence to fall from 166.9 per cent to 147.1 per cent (or 19.9 percentage points).

Both male and female low-wage jobs incidence followed a similar pattern to overall low-wage jobs: declining between 1997 and 2008 and increasing between 2008 and 2014. It is interesting to note that the growth rates for males and females were similar in the former time period (-12.6 per cent and -13.1 per cent respectively), while they were vastly different in the latter time period. In particular, male low-wage incidence grew 20.8 per cent, while female low-wage incidence grew by only 7.0 per cent.

Chart 13: Low-Wage Incidence by Gender, Employees (20-64), Canada, 1997-2014



Source: CSLS calculations.

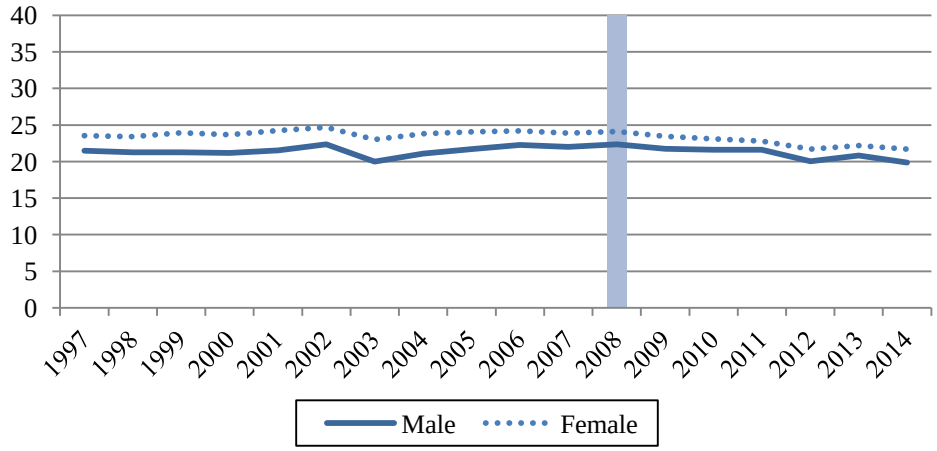
ii. Gap

When the low-wage gap is broken down by gender, females showed a consistently higher depth of low-wages than males over the 1997-2014 period (Chart 14). For example, in 2014, males had a low-wage gap of 19.9 per cent, while females had a low-wage gap of 21.7 per cent. The gap between the male and female low-wage gaps in 2014 was 1.8 percentage points. This

was slightly smaller than the 2.0 percentage point gap in 1997 when males had a 21.5 per cent low-wage gap and females had a 23.5 per cent low-wage gap. Between 1997 and 2014, both males and females saw a decline in their low-wage gaps. Once again, similar to the trend in the overall low-wage gap, both male and female low-wage gaps were fairly stable between 1997 and 2008 (increasing only 4.0 and 2.4 per cent respectively), while they decreased much more significantly between 2008 and 2014 (11.1 per cent and 9.8 per cent respectively).

In contrast to the much larger difference in low-wage incidences between males and females, the difference in the low-wage gaps between males and females is much smaller. In particular, the incidence of low-wage jobs for females is approximately 1.5 times higher than the incidence of low-wage jobs for males, while the low-wage gap for females is only about 1.1 times higher than that for males. It is possible that this is caused by the fact that the distribution of females by wage is more similar to the distribution of males by wage *for low-wage individuals*. In particular, even though there is a higher share of low-wage females than males, the distribution of females and males within the low-wage category are more comparable, and therefore, their average wages are more alike than those of males and females above the cutoff. In other words, when compared to the average wage of women relative to the average wage of men above the cutoff (91.5 per cent), the average wage of women is relatively closer to the average wage of men below the cutoff (97.7 per cent) (Table 2).

Chart 14: Low-Wage Gap by Gender, Employees (20-64), Canada, 1997-2014



Source: CSLS calculations.

Table 2: Average Hourly Wages by Gender, Employees (20-64), Canada, 2014

	Males ($)	Females ($)	Females/Males (%)
Average Hourly Wages	27.22	23.38	85.9
Average Hourly Wages Below the Cutoff	12.83	12.54	97.7
Average Hourly Wages Above the Cutoff	31.35	28.69	91.5

Source: CSLS calculations.

C. Age

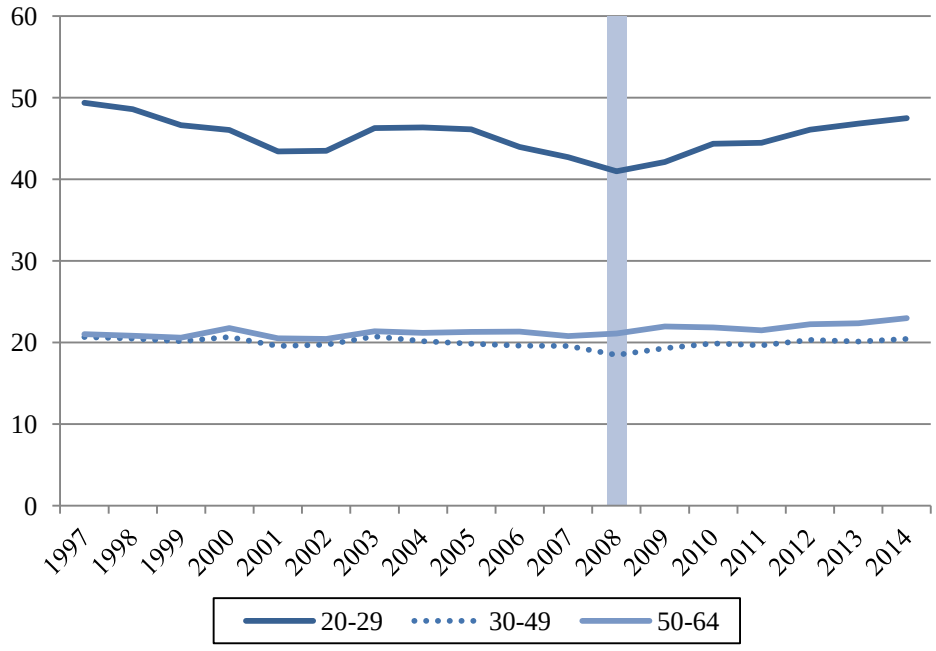
i. Incidence

Chart 15 shows the incidence of low-wage jobs by age group among employees aged 20 to 64 years in Canada between 1997 and 2014. Not surprisingly, those aged 20 to 29 years had a higher incidence of low-wage jobs (47.5 per cent) than those aged 30 to 49 years (20.4 per cent) and those aged 50 to 64 years in 2014 (23.0 per cent).

Since 1997, employees aged 20 to 29 years (young workers) have been more likely to be in low-wage jobs than employees aged 30 to 49 years (middle aged workers) or employees aged 50 to 64 years (older workers). Interestingly, the gap between young workers and the other two age groups has remained fairly stable over the 1997-2014 period, falling from 28.4 percentage points in 1997 to a trough of 19.9 percentage points in 2008 before increasing back up to 24.5 percentage points in 2014. It is also interesting to note that during this time frame, there were larger year-over-year changes in the trend of low-wage jobs among employees aged 20 to 29 years than among employees aged 30 to 49 years and among employees aged 50 to 64 years.

Similarly to the overall trend for low-wage jobs, the incidence of low wages decreased between 1997 and 2008 for young and middle aged employees (17.0 per cent and 10.6 per cent respectively), while it increased for young and middle aged employees between 2008 and 2014 (15.8 per cent and 10.4 per cent respectively). Older employees, however, saw their low-wage jobs incidence increase in both time periods (0.4 per cent between 1997 and 2008 and 8.9 per cent between 2008 and 2014).

Chart 15: Low-Wage Incidence by Age, Employees (20-64), Canada, 1997-2014

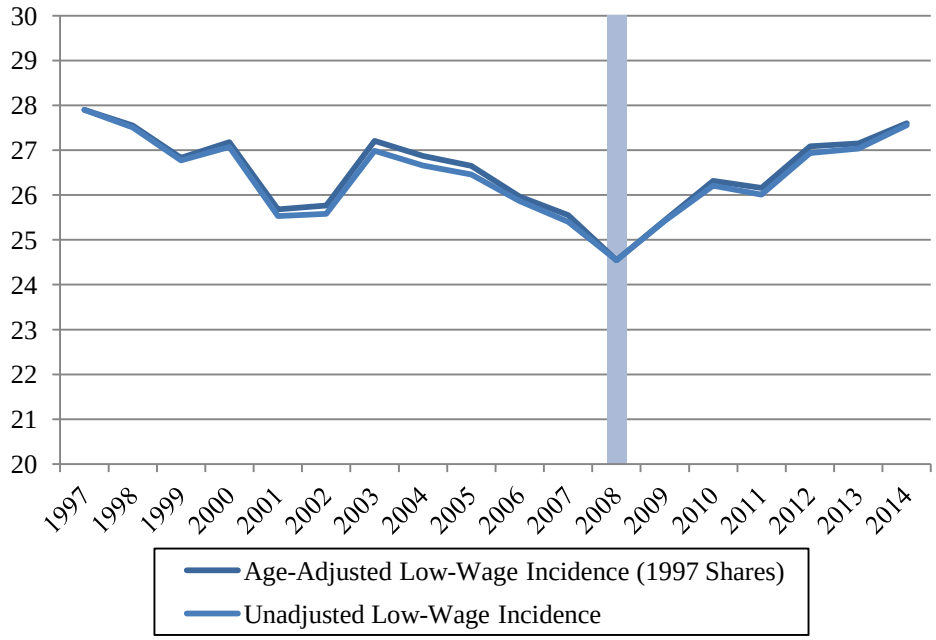


Source: CSLS calculations.

It is important to highlight the implications of Canada's aging population for aggregate low-wage incidence. In particular, between 1997 and 2014, the aggregate incidence of low-wage jobs will be increasingly influenced by trends among employees aged 50 to 64 years, and less by trends among those aged 20 to 29 years or employees aged 30 to 49 years. This is because the share of employees aged 50 to 64 years has been increasing over time (from 16.8 per cent in 1997 to 28.6 per cent in 2014), while the shares of employees aged 20 to 29 years and aged 30 to 49 years have been decreasing (by 1.3 percentage points for young workers and by 10.5 percentage points for middle aged workers). These changes should put downward pressure on overall low-wage incidence because older workers tend to have a lower incidence of low wages as they have more years of work experience and are further along in their careers.

The impact of Canada's aging population is shown in Chart 16. Surprisingly, as Canada's population has aged, the incidence of low wages has remained essentially unchanged: in 2014, the difference amounted to increasing the incidence from 27.56 per cent to 27.60 per cent, or a difference in the incidence of low wages for employees aged 20 to 64 years of 0.04 percentage points. This surprising result is likely due to the increase in the incidence of low wages among those aged 50 to 64 years during this time period.

Chart 16: Age-Adjusted Incidence of Low-Wage Jobs, Employees (20-64), Canada, 1997-2014



Source: CSLS calculations.

Over the 1997-2014 period, age-adjustment has the largest impact on the incidence of low wages in 2003, where the incidence of low wages was 27.0 per cent, but it would have been 27.2 per cent had there been no aging of the population (2.2 percentage points).

Overall, this means that the incidence of low wages for employees aged 20 to 64 years would have fallen slightly between 1997 and 2014 (0.3 percentage points) whether or not there was ageing in the Canadian population.

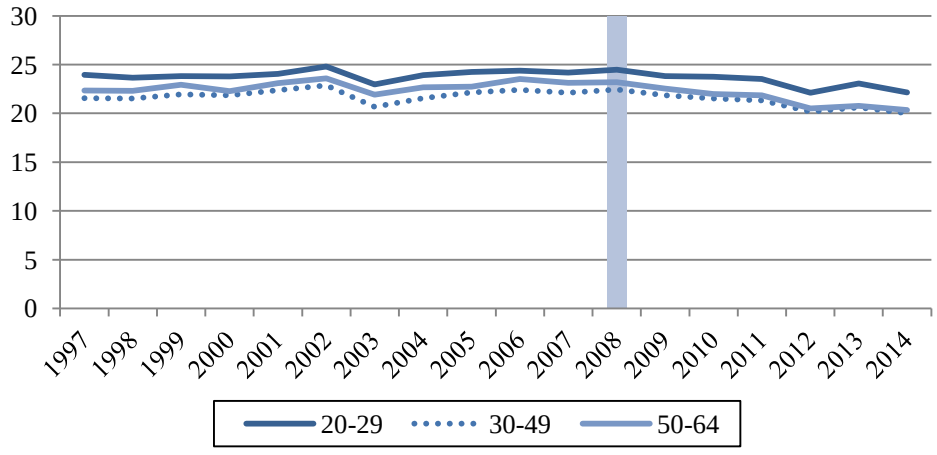
ii. Gap

In 2014, employees aged 20 to 29 years (young employees) had a higher low-wage gap than employees aged 50 to 64 years (older employees) who had a higher low-wage gap than employees aged 30 to 49 years (middle aged employees) (22.1 per cent versus 20.3 per cent versus 20.0 per cent) (Chart 17). Over the entire 1997-2014 time period, young employees had the highest low-wage gaps, followed by older employees and then middle-aged employees.

In 1997, young employees had a low-wage gap of 23.9 per cent, while middle-aged employees had a low-wage gap of 21.6 per cent. Older employees had a low-wage gap of 22.3 per cent. Hence, during this 18-year period, all types of employees saw their low-wage gaps decrease, but the decline was largest among older employees.

It is interesting to note that over the 1997-2008 period and the 2008-2014 period, the low-wage gap by age group demonstrated the same trend as the overall low-wage gap: showing extremely small increases in the former time frame and large decreases in the latter. In particular, between 1997 and 2008, the low-wage gap was fairly stable for all age groups, increasing only mildly (2.2 per cent for young employees, 4.1 per cent for middle aged employees, and 3.9 per cent for older employees), while the low-wage gap decreased quite significantly for all age groups between 2008 and 2014 (9.6 per cent for 20 to 29 years, 10.8 per cent for 30 to 49 years, and 12.4 per cent for 50 to 64 years).

Chart 17: Low-Wage Gap by Age (20-64), Canada, 1997-2014



Source: CSLS calculations.

D. Educational Attainment

i. Incidence

Chart 18 shows the incidence of low-wage jobs by educational attainment between 1997 and 2014. It is clear from this chart that higher levels of educational attainment reduce the likelihood of low-wages. In other words, there is a monotonic relationship: less educated workers fared considerably worse than more educated workers over the entire period between 1997 and 2014.[18] For example, in 2014, the incidence of low wages for persons with 0-8 years of education was 50.7 per cent, four times that of persons with a Master's or Doctorate degree (12.4 per cent).

Over the 1997-2014 period, every level of educational attainment saw an increase in its incidence of low wages. For example, in 2014, 12.4 per cent of employees with a Master's or a Doctorate degree earned less than the cutoff. This compares to 7.7 per cent in 1997. This increase is the result of (1) a 2.1 per cent per year increase in the number of employees with a Master's or Doctorate degree earning less than the cutoff, and (2) a 0.9 per cent per year increase in the total number of employees with a Master's or Doctorate degree between 1997 and 2014.

Between 1997 and 2008, there are some unique outcomes. In particular, five of the seven levels of educational attainment saw declines in their incidences of low wages, while two saw increases, namely 0 to 8 years of schooling and Master's or Doctorate degree. In contrast, over the 2008-2014 period, all seven levels of educational attainment saw increases in their incidences of low wages.

Table 3: Low-Wage Jobs Incidence, Growth, Per Cent, 1997-2014

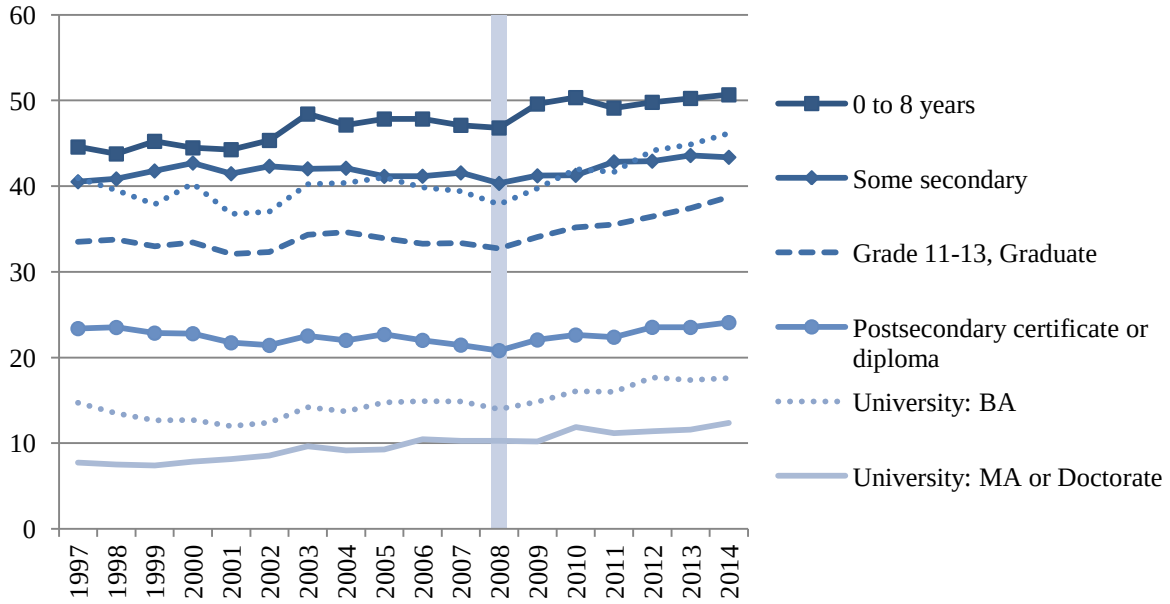
	1997	2008	2014	1997-2014	1997-2008	2008-2014
Total	27.9	24.5	27.6	-1.2	-12.0	12.3
0 to 8 years	44.6	46.8	50.7	13.7	5.0	8.3
Some secondary	40.5	40.3	43.4	7.0	-0.5	7.6
Grade 11-13, Graduate	33.5	32.7	38.7	15.7	-2.3	18.4
Some postsecondary	40.9	37.9	46.2	12.7	-7.5	21.8
Postsecondary certificate or diploma	23.4	20.8	24.1	3.0	-11.0	15.7
University: BA	14.7	14.0	17.6	19.6	-5.1	25.9
University: MA or Phd	7.7	10.3	12.4	59.9	32.8	20.5

Source: CSLS calculations.

[18] There is only one exception: the incidence of low-wage jobs for employees who completed only some postsecondary is actually higher than for those employees who completed grade 11-13 or high school but never attended postsecondary. It could be argued that this is the result of signalling or differing employment opportunities. In particular, individuals who complete only some postsecondary may signal negative traits to employers. Alternatively, individuals who enter the labour force directly from high school instead of continuing on to postsecondary may simply have had better employment opportunities with higher wages than those who chose to continue on to postsecondary, but eventually drop out. Finally, this could also be due in part to the fact that individuals who attend only some postsecondary may not have actually completed grades 11-13 or high school, since these are not required prerequisites for all postsecondary institutions.

In a recent *New York Times* article, it was suggested that the American economy is not producing enough jobs that require college degrees: "Private sector white-collar jobs can increasingly be moved offshore and automated, while public-sector jobs that require degrees, like teaching, have been decimated by deep layoffs and feeble hiring...[at the same time] business investment and consumer spending have suffered in the busts of recent decades, and government spending has not picked up the slack, leading to chronic shortfalls in the demand for goods, services and employees" (NYT, 2016). These changes are confirmed by the fact that "recent job growth has been in lower-paying occupations...[and] postings for jobs that do not require a college degree have steadily outpaced postings for those that do" (NYT, 2016). These observations may also explain why there has been an increase in the incidence of low wages in Canada, even at higher levels of educational attainment.

Chart 18: Low-Wage Incidence by Detailed Educational Attainment, Employees (20-64), Canada, 1997-2014



Source: CSLS calculations.

On first glance, it may appear paradoxical that the incidence of low-wage jobs is rising for all educational attainment groups, yet decreasing in the aggregate. This is explained by a shift in the distribution of employees between 1997 and 2014 toward higher levels of educational attainment which have lower low-wage incidences; otherwise we would have seen an increase in the incidence of low wages at the aggregate level. This compositional shift is shown in Table 4. In 1997, only 13.4 per cent of employees had a Bachelor's degree, while in 2014, this had risen to 20.2 per cent.

Table 4: Number and Distribution of All Employees (20-64) by Educational Attainment, 1997 and 2014

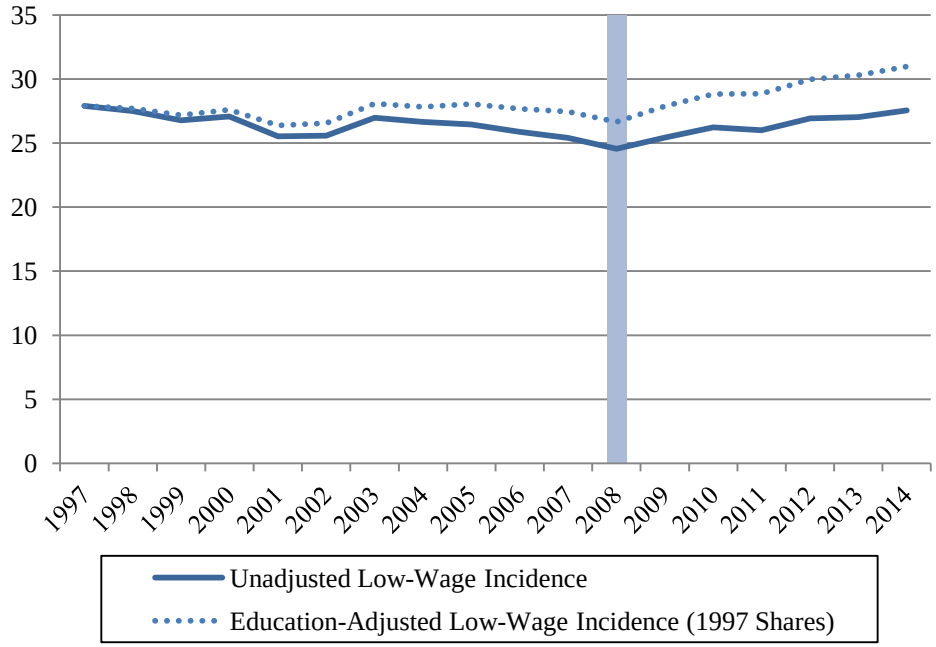
	1997		2014	
	Number	Per Cent	Number	Per Cent
0 to 8 years	428,336	4.0	191,885	1.4
Some secondary	1,192,619	11.2	771,320	5.6
Grade 11-13, Graduate	2,217,364	20.8	2,785,867	20.1
Some postsecondary	1,042,054	9.8	881,475	6.3
Post secondary certificate/diploma	3,716,616	34.9	5,275,963	38.0
University: BA	1,431,531	13.4	2,806,315	20.2
University: MA/PhD	620,842	5.8	1,181,374	8.5
Total	10,649,362	100.0	13,894,199	100.0

Source: CSLS calculations.

Chart 19 shows the exact impact of this compositional shift toward higher levels of educational attainment over the 1997-2014 period. In particular, assuming that the distribution of employees aged 20 to 64 years by educational attainment remained unchanged from 1997 the incidence of low wages would have been 31.0 per cent, 3.4 percentage points higher than the actual 27.6 per cent. Instead, since the Canadian population became increasingly educated over time, the incidence of low wages was pulled down.

One implication of these results is that increased educational attainment should be lowering the incidence of low wages over time. This, however, is not showing up in the actual incidence of low wages, which is essentially stable between 1997 and 2014. This suggests that the demand for well-paying jobs has outpaced the supply.

Chart 19: Education-Adjusted Incidence of Low Wages, Employees (20-64), Canada, 1997-2014



Source: CSLS calculations.

ii. Gap

In Table 5, the low-wage gap is broken down by educational attainment for the 1997-2014 period. In 2014, employees with 0 to 8 years of educational attainment had the highest low-wage gap (23.2 per cent), while those with a postsecondary certificate or diploma had the lowest low-wage gap (19.8 per cent). This is a mere 3.4 percentage point difference. In 1997, employees with some postsecondary had the highest low-wage gap, while individuals with a postsecondary certificate or diploma had the lowest low-wage gap. Between 1997 and 2014, only those employees with a Master's or a Doctorate degree saw an increase in their low-wage gap. Every other level of educational attainment saw their low-wage gap decline. The fastest decline occurred among those with some secondary.

Table 5: Low-Wage Gap by Educational Attainment (20-64), Canada, 1997-2014

	0 to 8 years	Some secondary	Grade 11-13, Graduate	Some postsecondary	Postsecondary certificate or diploma	University: BA	University: MA or Phd	Total
1997	23.4	23.4	22.7	24.1	21.7	21.8	22.5	22.7
1998	23.7	23.6	22.5	23.9	21.5	21.5	22.2	22.6
1999	24.3	23.7	23.0	24.0	21.8	22.0	22.2	22.9
2000	24.7	23.8	22.6	23.8	21.5	22.0	23.5	22.7
2001	25.8	24.1	23.2	24.3	22.0	22.3	23.7	23.2
2002	26.0	25.0	23.7	25.0	22.7	22.1	25.0	23.8
2003	24.5	22.9	21.8	23.1	20.5	21.1	22.7	21.8
2004	25.7	23.8	22.5	24.1	21.6	21.9	22.9	22.7
2005	26.0	24.2	23.1	24.5	21.9	22.6	23.2	23.1
2006	25.7	24.7	23.4	24.8	22.3	22.8	23.7	23.4
2007	25.3	24.3	23.1	24.4	22.0	22.9	24.2	23.2
2008	26.1	24.2	23.5	24.6	22.4	22.8	24.0	23.4
2009	25.5	23.6	23.2	24.1	21.4	22.5	23.9	22.8
2010	24.3	23.5	22.7	24.3	21.4	22.1	22.2	22.5
2011	23.9	23.1	22.6	24.0	21.2	22.0	23.3	22.3
2012	23.0	21.5	21.3	22.6	20.0	21.1	21.2	21.0
2013	23.6	21.9	22.0	23.4	20.5	21.1	22.7	21.6
2014	23.2	21.2	21.3	22.8	19.8	20.6	22.6	21.0
97-14	-0.2	-2.2	-1.4	-1.3	-1.9	-1.2	0.1	-1.8

Source: CSLS calculations.

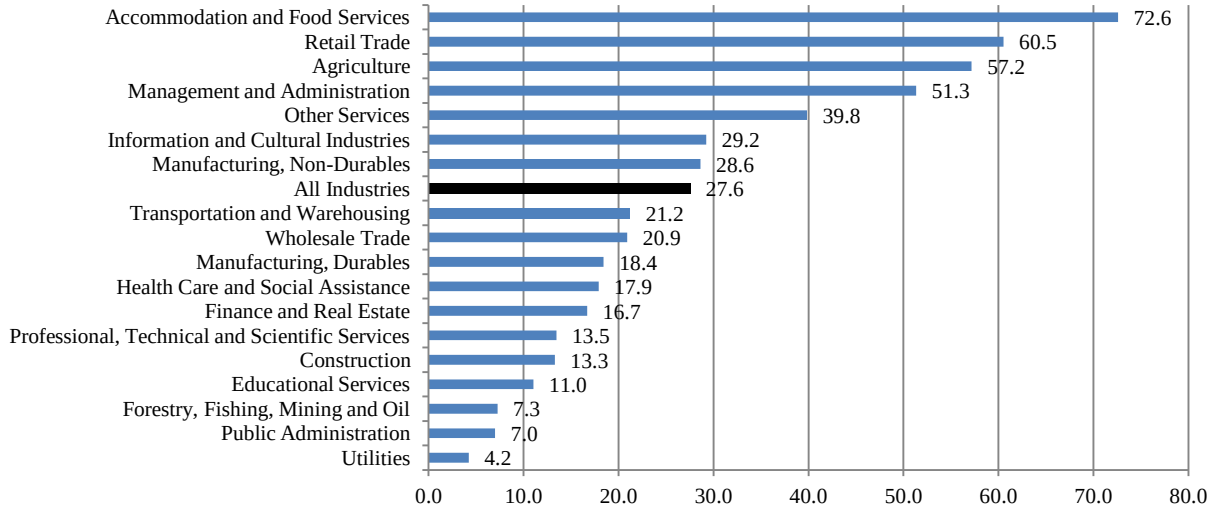
It is quite surprising that the low-wage gaps are so similar across educational attainment categories. One might have expected a lower gap for university educated individuals relative to individuals with less educational attainment, as it might be thought that university-educated individuals that are low wage should have wages that are closely lumped around the cutoff. Surprisingly, this is not the case. This may be because immigrants are more highly represented among more highly educated individuals in the low-wage category. It has been shown by other researchers that immigrants tend to be employed in positions that are significantly below their level of educational attainment. This would push up the low-wage gap for the higher levels of educational attainment, since jobs that require less educational attainment tend to have lower hourly wages.

E. Industry

i. Incidence

Of the 18 industries we considered, accommodation and food services had the highest incidence of low-wage jobs in 2014 at 72.6 per cent, while utilities had the lowest incidence of low-wage jobs at 4.2 per cent (Chart 20). This shows that there is a very large amount of variation in the incidence of low-wage jobs at the industry level relative to the all industry average of 27.6 per cent.

Chart 20: Low-Wage Incidence by Industry, Employees (20-64), Canada, 2014

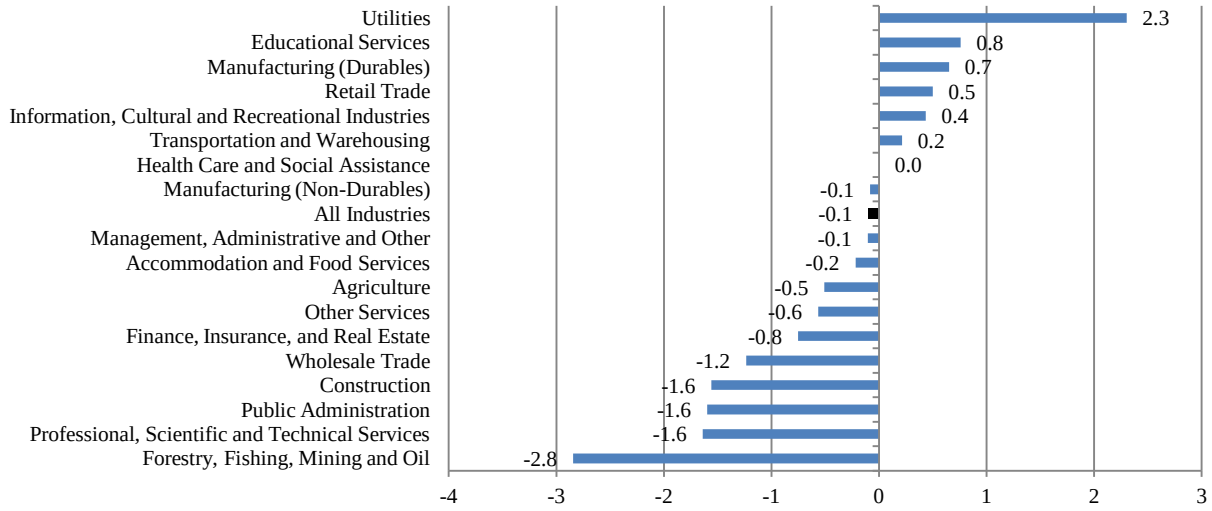


Source: CSLS calculations.

The absolute change in the incidence of low-wage jobs over the 1997-2014 period was also varied by industry. For example, the incidence of low-wage jobs increased by 4.9 percentage points in retail trade between 1997 and 2014, while the incidence of low-wage jobs decreased by 5.2 percentage points in agriculture during this same time period.

However, since each industry had a different incidence of low wages in 1997, it is also informative to examine the rate of change in the incidence of low-wage jobs over the 1997-2014 period. In particular, even though agriculture saw the largest decline in the incidence of low-wage jobs (5.2 percentage points), this translated into a decrease of only 0.5 per cent per year because of its high incidence of 57.2 per cent (Chart 21). In contrast, professional, scientific and technical services saw its incidence of low-wage jobs decline by 1.6 per cent per year even though the absolute change in the incidence of low-wage jobs was 4.4 percentage points between 1997 and 2014, less than that of agriculture.

Chart 21: Low-Wage Incidence by Industry, Average Annual Growth, Per Cent, 1997-2014



Source: CSLS calculations.

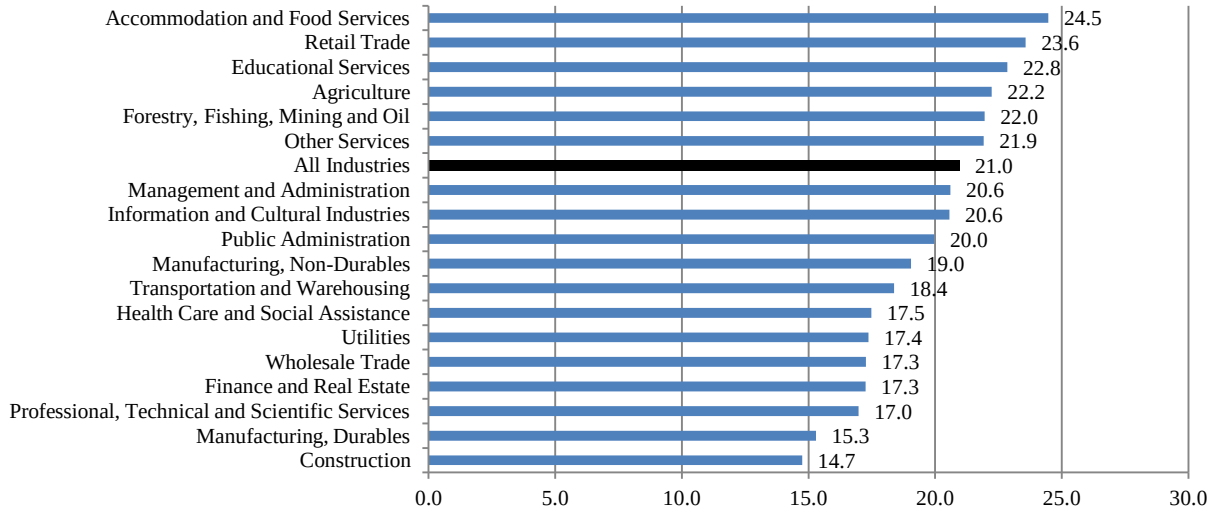
From this perspective, the industries that saw the largest rates of change in their incidences of low-wage jobs during this 18-year period were forestry, fishing, mining and oil (negative 2.8 per cent per year) and utilities (2.3 per cent per year).

It is interesting to note that the majority of the industries followed the same trend as the aggregate incidence of low-wage jobs for employees aged 20 to 64 years, decreasing between 1997 and 2008 and increasing between 2008 and 2014. There are a few notable exceptions. In particular, over the 1997-2008 period, two industries saw their low-wage incidence increase, namely utilities (21.6 per cent) and educational services (8.4 per cent). On the other hand, during the 2008-2014 time frame, two industries saw declines: forestry, fishing, mining and oil (-0.1 per cent) and wholesale trade (-0.1 per cent).

ii. Gap

In 2014, accommodation and food services had the highest low-wage gap of all 18 industries considered at 24.5 per cent (Chart 22). The lowest low-wage gap in 2014 was in construction at 14.7 per cent. There is clearly a large amount of variation in the low-wage gap at the industry level, although there is much less variation across industries in the gap than in the incidence (9.8 percentage points and 68.4 percentage points).

Chart 22: Low-Wage Gap by Industry, Employees (20-64), Canada, 2014

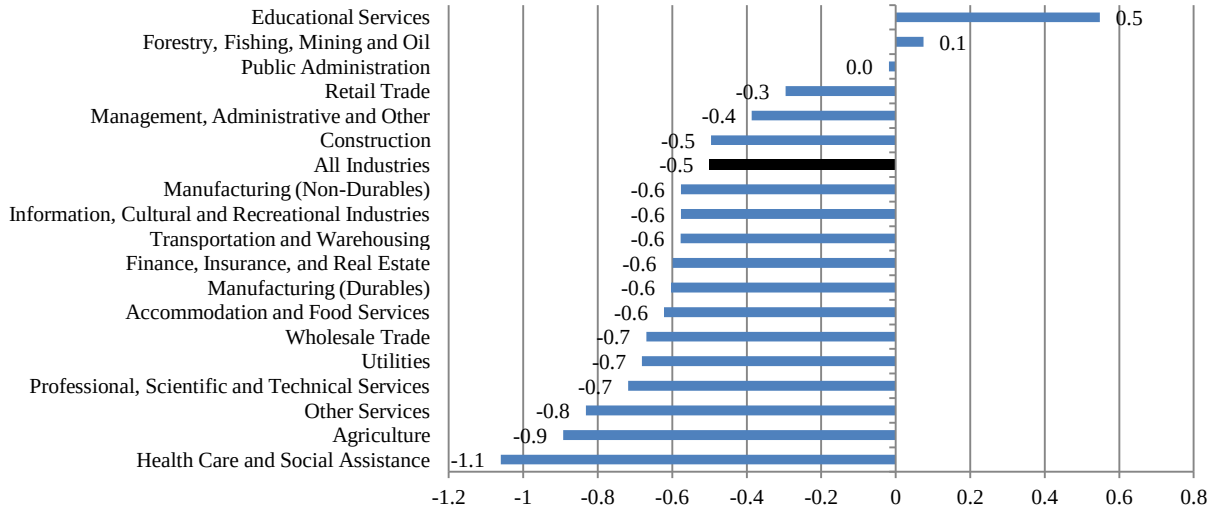


Source: CSLS calculations.

Over the 1997-2014 period, the industry that saw the largest absolute decline in its low-wage gap was agriculture at 3.7 percentage points. Every other industry, except educational services and forestry, fishing, mining and oil, saw declines in their low-wage gaps over this period. These two industries saw absolute increases of 2.0 percentage points and 0.3 percentage points, respectively.

From the perspective of the rate of change between 1997 and 2014, health care and social assistance saw the fastest decline at 1.1 per cent per year, while educational services saw the fastest increase at 0.5 per cent per year.

Chart 23: Low-Wage Gap by Industry, Average Annual Growth, Per Cent, 1997-2014



Source: CSLS calculations.

If we look at the 1997-2008 and 2008-2014 periods, we see that most industries demonstrated the same trends as the overall incidence of low-wage jobs, showing mild increases in the former time frame and larger decreases in the latter. There were two types of exceptions between 1997 and 2008: (1) those that saw mild declines, namely agriculture (2.0 per cent), management, administrative and other (0.4 per cent), and other services (0.2 per cent); and (2) those that saw large increases, namely manufacturing (durables) at 19.1 per cent, educational services at 19.7 per cent, and public administration at 11.3 per cent. In contrast, between 2008 and 2014, every singly industry saw relatively large declines (except forestry, fishing, mining and oil which saw a fairly mild decrease of only 2.9 per cent).

F. Occupation

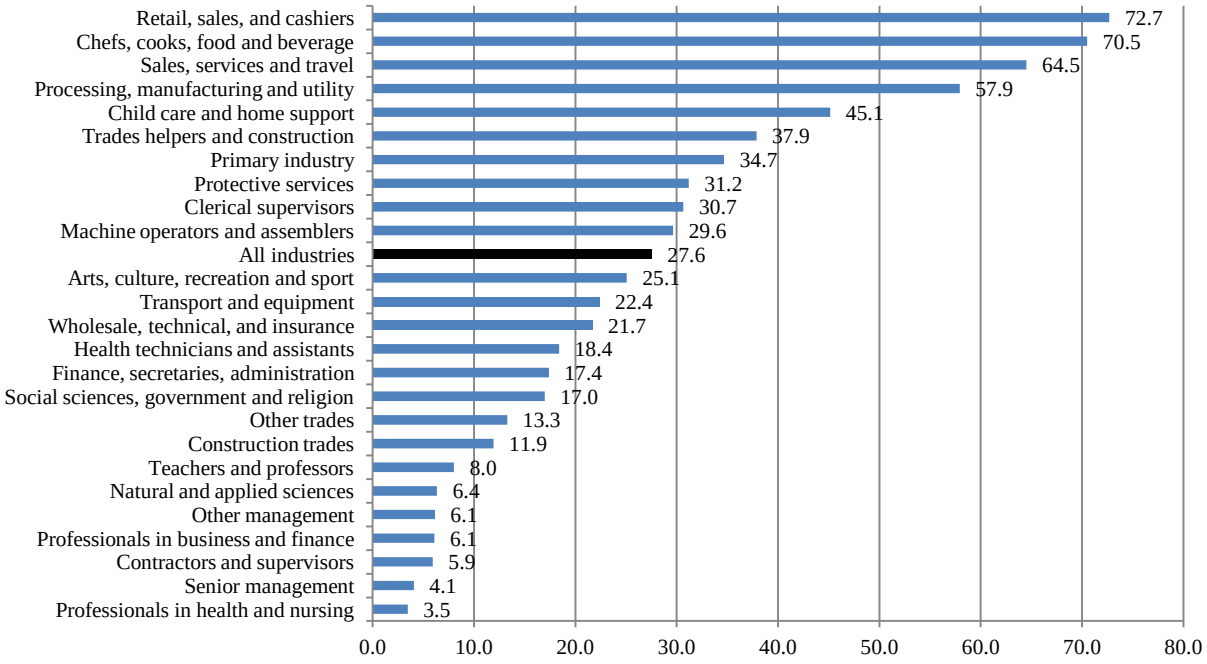
i. Incidence

Chart 24 shows that those in retail, sales and cashier occupations had the highest incidence of low-wage jobs in 2014 at 72.7 per cent, followed closely by chefs, cooks and those in food and beverage occupations at 70.5 per cent. The lowest incidence of low-wage jobs in 2014 was demonstrated by professionals in health and nursing (3.5 per cent) and those in senior management (4.1 per cent).

Over the 1997-2014 period, those in management positions other than senior management saw the largest absolute decline and the fastest rate of decline in their incidence of low-wage jobs (7.7 percentage points and 4.7 per cent per year). The largest absolute increase occurred among those in processing, manufacturing and utility occupations (17.4 percentage points). Employees in these occupations also saw the fastest rate of increase in their incidence of low-wage jobs (2.1 per cent per year).

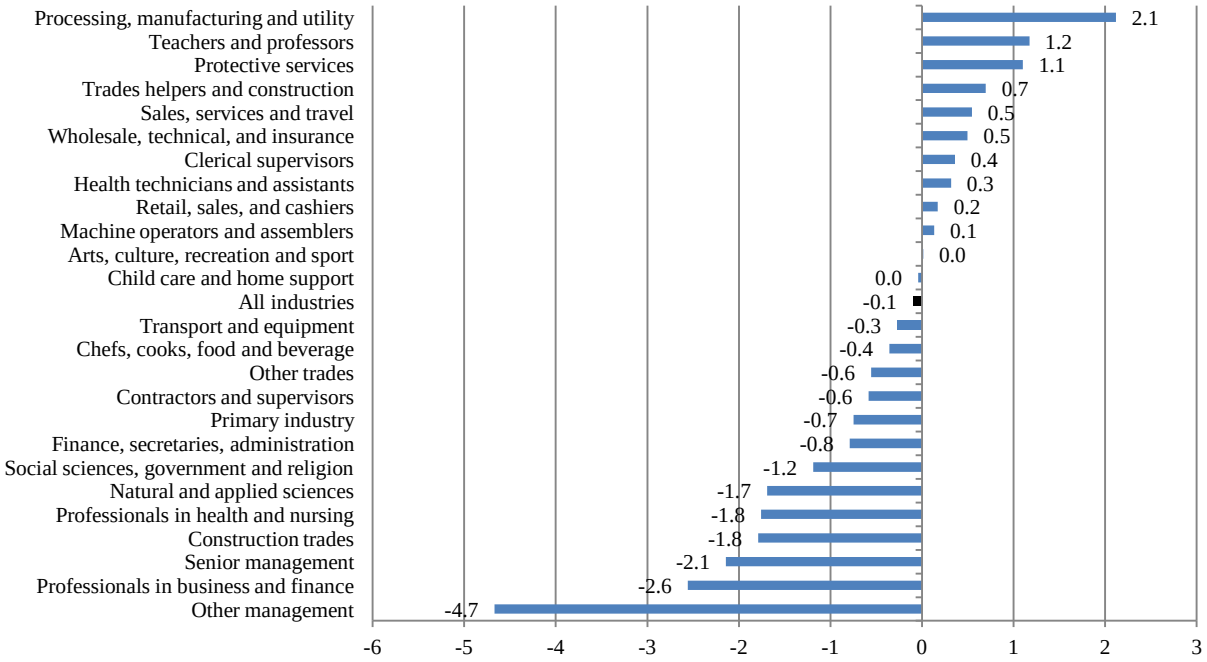
In general, similarly to the overall incidence of low-wage jobs, occupations tended to see decreases in their incidence of low-wage jobs between 1997 and 2008 and increases between 2008 and 2014. There were four notable exceptions in the former time period that saw increases in their incidence of low wages: wholesale trade, technical, and insurance occupations (0.2 per cent), protective services (5.3 per cent), sales, services, and travel (0.5 per cent) and processing, manufacturing and utility (21.3 per cent). There were also some notable exceptions in the latter time period that saw decreases in their incidence of low wages: other management (29.8 per cent) and construction trades (5.6 per cent).

Chart 24: Low-Wage Incidence by Occupation, Employees (20-64), Canada, 2014



Source: CSLS calculations.

Chart 25: Low-Wage Incidence by Occupation, Average Annual Growth, Per Cent, 1997-2014



Source: CSLS calculations.

ii. Gap

Similarly to the observation made concerning industries, there is much more variation in the range of the incidence of low wages among occupations (69.2 percentage points) than in the range of the low-wage gap among occupations (12.8 percentage points).

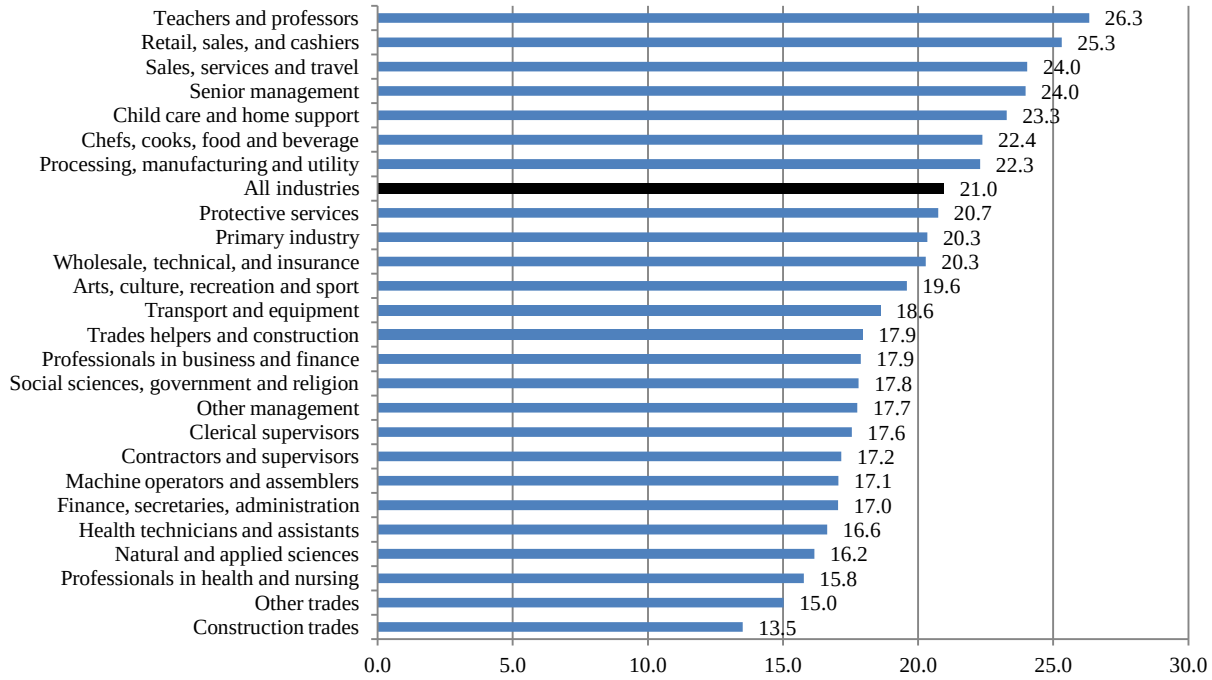
Teachers and professors had the largest low-wage gap in 2014 of all 25 occupations examined at 26.3 per cent (Chart 26). The construction trades had the smallest low-wage gap at 13.5 per cent. The surprising result for teachers is likely due to the inclusion of unpaid hours. In particular, for salaried employees, Statistics Canada calculated hourly earnings based on usual salary and usual hours worked. This implies that professionals, like some teachers, who tend to work more on average will see their hourly earnings fall. For example, suppose an individual has a salary of $50,000 per year. If they work 40 hours a week for 50 weeks of the year, they work a total of 2,000 hours. This means that they earn $25 per hour. Now, suppose that an individual with the same salary works 50 hours per week for 50 weeks. This individual earns only $20 an hour.[19]

Between 1997 and 2014, social sciences, government and religion occupations saw the largest absolute decline in their low-wage gap (4.9 percentage points). This group of occupations also had the fastest rate of decline over this period at 1.4 per cent per year. On the other end of the spectrum, teachers and professors saw the largest absolute increase in their low-wage gap (3.1 percentage points), as well as the fastest rate of increase (0.7 per cent per year). Of the 23 other occupational groupings, 19 saw decreases in their low-wage gaps over the 1997-2014 period.

When we examine the period pre-2008, we find that most industries do not mimic the overall trend at the aggregate level of mild increases. In particular, there were seven industries out of twenty-five that saw negative changes in their low-wage gaps between 1997 and 2008 and nine industries that saw fairly large increases in their low-wage gaps (above 5.0 per cent). However, after 2008, all twenty-five industries saw declines in their low-wage gaps (although two industries saw mild decreases of less than 5.0 per cent). This lines up more closely with the aggregate trend.

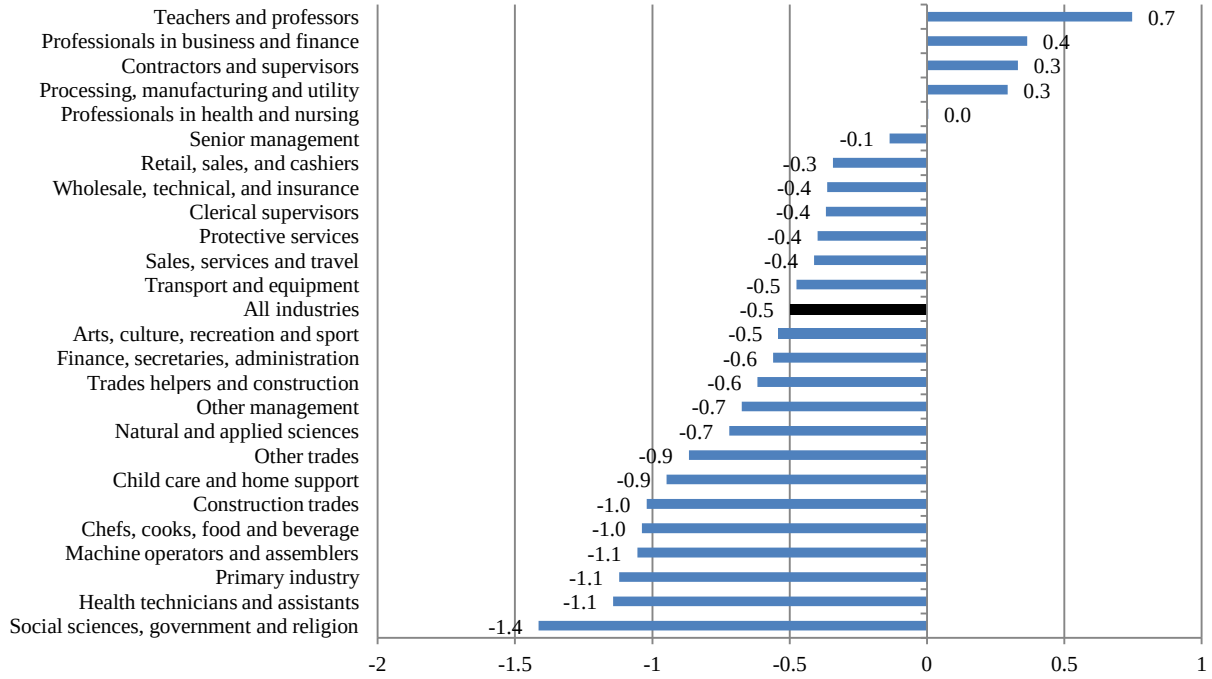
[19] Using the LFS microdata, it is possible to show that 3.1 per cent of teachers and professors work more than 50 hours a week and 34.6 per cent work between 40 and 50 hours a week. Since only 8.0 per cent of teachers and professors are considered low-wage, this provides some evidence for our explanation of unpaid work in this occupation as the reason for the relatively high low-wage gap.

Chart 26: Low-Wage Gap by Occupation, Employees (20-64), Canada, 2014



Source: CSLS calculations.

Chart 27: Low-Wage Gap by Occupation, Average Annual Growth, Per Cent, 1997-2014



Source: CSLS calculations.

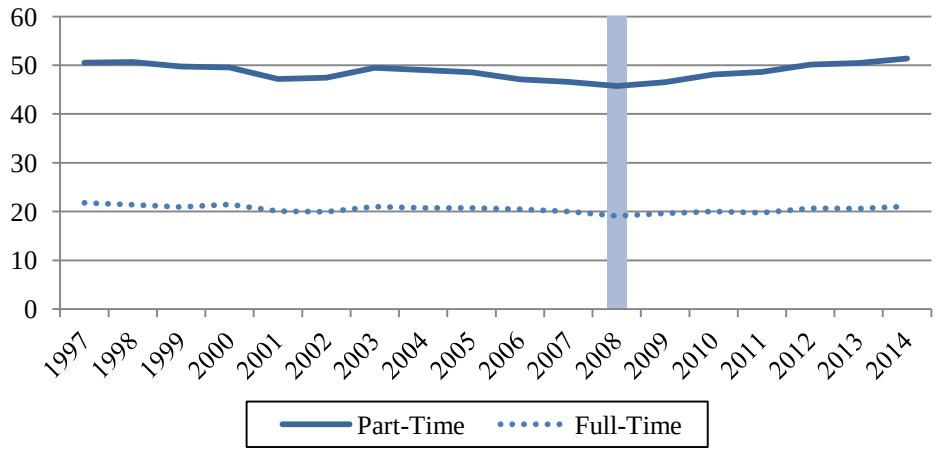
G. Employment Status

i. Incidence

In 2014, only 21.0 per cent of full-time employees had low wages, while 51.3 per cent of part-time employees had low wages (Chart 28).[20] Since part-time work is often minimum wage work, it is not surprising that the incidence of low wages is much higher among part-time employees than among full-time employees.

Over the 1997-2014 period, the incidence of low wages among part-time employees increased by 0.8 percentage points while the incidence of low wages among full-time employments decreased by 0.8 percentage points, leading to an increase in the gap between these two groups from 28.8 percentage points to 30.3 percentage points (or 1.6 percentage points). Similarly to the trend in the overall incidence of low-wage jobs, the incidence of low-wage jobs by employment status decreased between 1997 and 2008 and increased between 2008 and 2014. In particular, over the former time period, the incidence of low-wage jobs fell by 9.5 per cent among part-time workers and 12.4 per cent among full-time workers. In contrast, it increased by 12.3 per cent among part-time workers and 10.2 per cent among full-time workers in the latter time period.

Chart 28: Low-Wage Incidence by Employment Status, Employees (20-64), Canada, 1997-2014



* Our definition of full-time work, 35 hours or more, differs from the Statistics Canada definition of full-time, 30 hours or more.
Source: CSLS calculations.

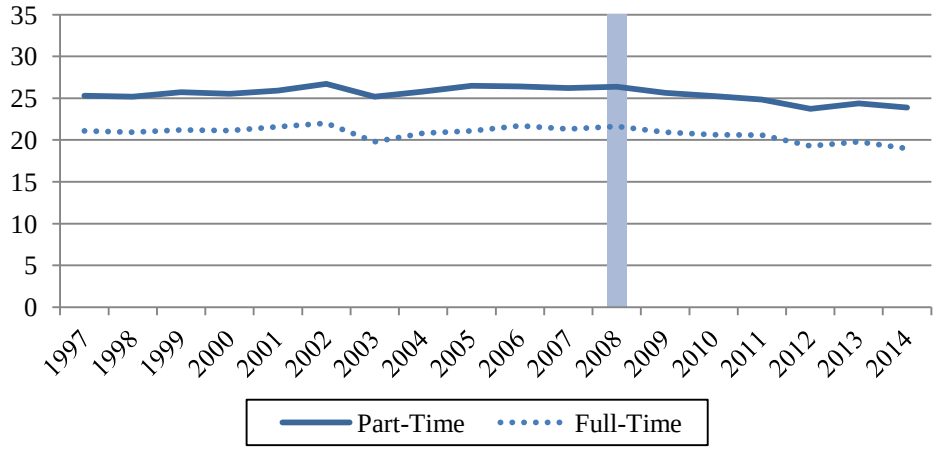
ii. Gap

Part-time employees aged 20 to 64 years faced a low-wage gap of 23.9 per cent in 2014 (Chart 29). This is nearly five percentage points higher than the 19.0 per cent low-wage gap

[20] In 2014, 19.5 per cent of all employees aged 20 to 64 years were part-time (i.e. less than 35 hours per week). This was 4.5 percentage points higher than in 1997 (15.0 per cent).

among full-time employees. This difference is not surprising given that part-time employment is more likely to be minimum wage work than full-time employment.[21]

Chart 29: Low-Wage Gap by Employment Status, Employees (20-64), Canada, 1997-2014



* Our definition of full-time work, 35 hours or more, differs from the Statistics Canada definition of full-time, 30 hours or more.
Source: CSLS calculations.

During our 18-year period of observation, both full-time and part-time employees displayed strikingly similar trends in terms of the evolution of the low-wage gap, ending the time series with low-wage gaps that were 2.1 percentage points and 1.4 percentage points lower than their low-wage gaps of 21.1 per cent and 25.3 per cent in 1997.

This change can be broken down into very mild growth over the 1997-2008 period and strong negative growth over the 2008-2014 period. Specifically, part-time employees saw their low-wage gap increase by a mere 4.3 per cent over the former period, while the low-wage gap decreased by 9.4 per cent over the latter period. For full-time workers, these were an increase of 2.5 per cent and a decrease of 12.1 per cent respectively.

H. Summary

Table 6 summarizes some of the main estimates presented in this section. In general, we find that for the incidence of low-wage jobs, both personal characteristics and job characteristics are important, while for the low-wage gap, job characteristics matter a lot and personal characteristics relatively little.

[21] It is likely that this is largely because part-time jobs are concentrated in industries and occupations with large low-wage gaps. However, it would be interesting to examine the low-wage gap for part-time and full-time employees by occupation and by industry.

Table 6: Summary of Low-Wage Employment Results

	1997	2008	2014	Δ(1997-2008)	Δ(2008-2014)	Δ(1997-2014)
All Employees (20-64)						
Incidence	27.9	24.5	27.6	-3.4	3.1	-0.3
Gap	22.7	23.4	21.0	0.7	-2.4	-1.7
Intensity	6.3	5.7	5.8	-0.6	0.1	-0.5
Gender						
Incidence						
Female	35.3	30.7	32.8	-4.6	2.1	-2.5
Male	21.2	18.5	22.3	-2.7	3.8	1.1
Gap						
Female	23.5	24.1	21.7	0.6	-2.4	-1.8
Male	21.5	22.3	19.9	0.8	-2.4	-1.6
Intensity						
Female	8.3	7.4	7.1	-0.9	-0.3	-1.2
Male	4.6	4.1	4.4	-0.5	0.3	-0.2
Age						
Incidence						
20-29	49.4	41.0	47.5	-8.4	6.5	-1.9
30-49	20.7	18.5	20.4	-2.2	1.9	-0.3
50-64	21.0	21.1	23.0	0.1	1.9	2.0
Gap						
20-29	23.9	24.5	22.1	0.6	-2.4	-1.8
30-49	21.6	22.5	20.0	0.9	-2.5	-1.6
50-64	22.3	23.2	20.3	0.9	-2.9	-2.0
Intensity						
20-29	11.8	10.0	10.5	-1.8	0.5	-1.3
30-49	4.5	4.2	4.1	-0.3	-0.1	-0.4
50-64	4.7	4.9	4.7	0.2	-0.2	0.0
Employment Status (FT/PT)						
Incidence						
Full-Time	21.8	19.1	21.0	-2.7	1.9	-0.8
Part-Time	50.5	45.7	51.3	-4.8	5.6	0.8
Gap						
Full-Time	21.1	21.6	19.0	0.5	-2.6	-2.1
Part-Time	25.3	26.4	23.9	1.1	-2.6	-1.4
Intensity						
Full-Time	4.6	4.1	4.0	-0.5	-0.1	-0.6
Part-Time	12.8	12.1	12.3	-0.7	0.2	-0.5

Source: CSLS calculations.

IV. Trends in Low-Wage Jobs in Canadian Provinces

A. Unadjusted

i. Incidence

Table 7 shows the incidence of low-wage jobs across provinces in Canada between 1997 and 2014. It is important to note that the national cutoff was applied to provincial wage data.

This table shows that Prince Edward Island had the highest incidence of low-wage jobs out of the ten provinces in Canada in 2014 at 39.7 per cent. New Brunswick was only 2.2 percentage points lower at 37.5 per cent. The province with the lowest incidence of low-wage jobs in 2014 was Alberta at 18.8 per cent, followed by Saskatchewan at 21.7 per cent.

It is important to note that these differences at the provincial level in low-wage incidence reflect differences in the average wages between provinces relative to the national average.

Table 7: Low-Wage Incidence by Province, Employees (20-64), Canada, No Cost-of-Living Adjustment, 1997-2014

	CAN	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC
1997	27.9	39.7	46.1	42.8	41.1	29.1	25.1	34.0	34.1	30.5	21.5
1998	27.5	41.4	45.6	41.4	40.4	29.1	24.3	34.1	33.3	29.9	21.5
1999	26.8	41.1	45.2	41.0	38.9	28.8	23.7	32.9	32.8	28.2	20.4
2000	27.1	41.1	45.4	40.4	38.5	28.9	23.6	33.7	32.8	29.5	22.2
2001	25.5	39.4	43.0	38.6	37.7	27.4	22.1	32.5	30.5	25.6	22.2
2002	25.6	39.3	42.3	39.3	38.1	27.3	22.3	31.8	30.3	25.4	22.4
2003	27.0	40.8	40.7	39.1	39.4	28.0	24.2	34.1	31.4	26.6	24.2
2004	26.7	40.9	39.7	38.4	39.1	27.1	23.7	32.1	30.5	26.5	25.8
2005	26.5	42.0	40.6	38.5	39.9	26.9	24.1	33.0	30.5	23.9	25.2
2006	25.9	41.7	41.0	38.1	39.6	26.7	24.3	31.4	28.1	20.2	24.7
2007	25.4	39.7	41.6	35.8	38.3	26.8	24.9	30.1	28.0	17.1	23.4
2008	24.5	38.1	39.1	36.9	35.4	26.4	24.4	29.3	24.4	15.3	22.1
2009	25.4	37.4	39.9	36.7	35.9	26.7	25.7	29.3	23.4	16.9	23.4
2010	26.2	37.4	39.0	36.4	36.1	27.2	26.9	29.8	23.4	18.1	23.7
2011	26.0	35.0	37.8	35.4	36.2	27.0	26.5	29.0	21.7	18.4	24.7
2012	26.9	34.1	37.6	35.7	38.2	27.6	28.1	30.4	22.8	18.3	25.5
2013	27.0	31.4	36.7	36.6	37.6	27.9	28.6	30.8	21.7	17.9	25.1
2014	27.6	31.1	39.7	35.5	37.5	28.2	29.1	30.8	21.7	18.8	26.7
97-14	-0.3	-8.6	-6.4	-7.4	-3.6	-0.9	4.1	-3.1	-12.4	-11.8	5.2
97-08	-12.0	-4.1	-15.2	-13.8	-13.8	-9.2	-2.6	-13.9	-28.5	-49.8	3.0
08-14	12.3	-18.3	1.6	-3.9	5.9	6.8	19.3	5.4	-10.9	22.3	20.7

Source: CSLS calculations.

Over the 1997-2014 period, Saskatchewan saw the largest decline in the incidence of low-wage jobs from 34.1 per cent to 21.7 per cent (12.4 percentage points). Alberta also saw a large decline during this period (11.8 percentage points). Ontario and British Columbia were the only two provinces in Canada to experience an increase in the incidence of low-wage jobs between 2000 and 2014 by 4.1 percentage points and 5.2 percentage points respectively. This implies that the stability at the national level is driven entirely by increases in Ontario and British Columbia, which offset the declines seen in every other province.

It is possible that Ontario's increase in the incidence of low wages has been driven by the decline of manufacturing as a share of employment. It is unclear why British Columbia also saw an increase in its incidence of low wages.

If we examine the results over the 1997-2008 and 2008-2014 periods, we find that almost all of the provinces display trends similar to those of Canada, but there are a few notable exceptions. In particular, Newfoundland and Labrador, Nova Scotia, and Saskatchewan

continued to see declines in their incidences of low wages even after 2008. These two Atlantic provinces might have seen declines in their incidences of low-wage jobs due to migration: these economies were not exactly booming during these times, so it is possible that those who would have had low-wage jobs migrated to other provinces in search of higher paying employment, thereby reducing low-wage jobs in the Maritimes.

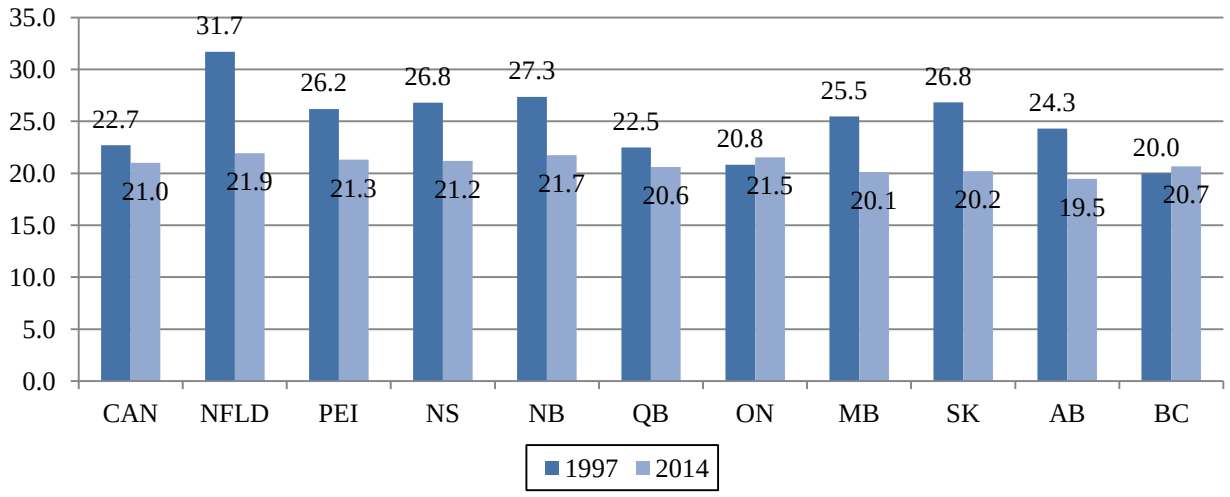
ii. Gap

The low-wage gap for all ten Canadian provinces in 1997 and 2014 is shown in Chart 30. The province with the highest low-wage gap in 2014 was Newfoundland and Labrador at 21.9 per cent. The province with the lowest low-wage gap was Alberta at 19.5 per cent. In 1997, there was much more variability across provinces. In particular, there was an 11.7 percentage point gap between the highest low-wage gap (in Newfoundland and Labrador at 31.7 per cent) and the lowest low-wage gap (at 20.0 per cent in British Columbia). It is unclear why there is less variation in low-wage gaps in 2014 than in 1997.

Over the 1997-2008 period, there is a substantial amount of variation at the provincial level. Some provinces saw large declines in their low-wage gap (e.g. 11.4 percentage points in Newfoundland and Labrador), while others saw large increases (e.g. Ontario). This implies that the relatively stability between 1997 and 2008 at the national level is not reflected at the provincial level for this time period. In contrast, over the 2008-2014 period, all ten provinces saw declines in their low-wage gaps, which was naturally reflected in the national aggregate.

Similarly to the case of the incidence of low wages, despite large decreases in the low-wage gap in most provinces, Canada's low-wage gap saw only mild declines because there were increases in Ontario and British Columbia, which offset the declines in the other provinces because these provinces are large in terms of their shares of employees aged 20 to 64 years.

Chart 30: Low-Wage Gap by Province (20-64), Canada, 1997 and 2014



Source: CSLS calculations.

B. Cost-of-Living Adjustment

This section investigates how the use of cost-of-living adjustments (Table 8) affects measurement of the incidence of low-wage jobs and the low-wage gap in Canadian provinces. Quite simply, we adjust each individual's real 2014 dollar hourly wages by their province's main city's inter-city price index. For provinces with price levels below the national average of 100, hourly wages will increase, while for provinces with price levels above the national average, hourly wages will decrease.

Four provinces (Prince Edward Island, New Brunswick, Quebec, and Manitoba) had price indices below 100 in every year. Two provinces (Ontario and British Columbia) had price indices above 100 in every year. One province (Alberta) was sometimes above the national average. The remaining five provinces had price indices that were either below the national average or equal to the national average.

Table 8: Inter-City Price Levels, Canada, Combined City Average=100, All Components, 2000-2014

	St. John's	Charlottetown and Summerside	Halifax	Saint John	Montréal	Toronto and Ottawa*	Winnipeg	Regina	Edmonton	Vancouver
	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC
2000	100	95	100	95	95	107	92	93	93	106
2001	99	95	99	93	94	108	92	93	93	106
2002	97	94	100	94	95	108	91	92	95	105
2003	96	93	97	92	93	108	91	90	97	103
2004	95	93	98	93	93	108	92	92	97	102
2005	95	94	98	93	93	108	92	92	97	102
2006	93	94	99	92	93	107	92	93	97	104
2007	98	94	99	96	95	105	94	93	98	103
2008	97	95	99	95	95	106	94	95	101	101
2009	96	97	98	96	95	106	94	97	102	101
2010	95	93	99	94	95	106	93	94	99	103
2011	94	93	100	94	93	105	93	95	99	105
2012	95	94	100	94	93	105	93	97	99	105
2013	98	95	100	96	93	106	95	99	100	104
2014	97	95	100	95	94	106	94	100	100	103

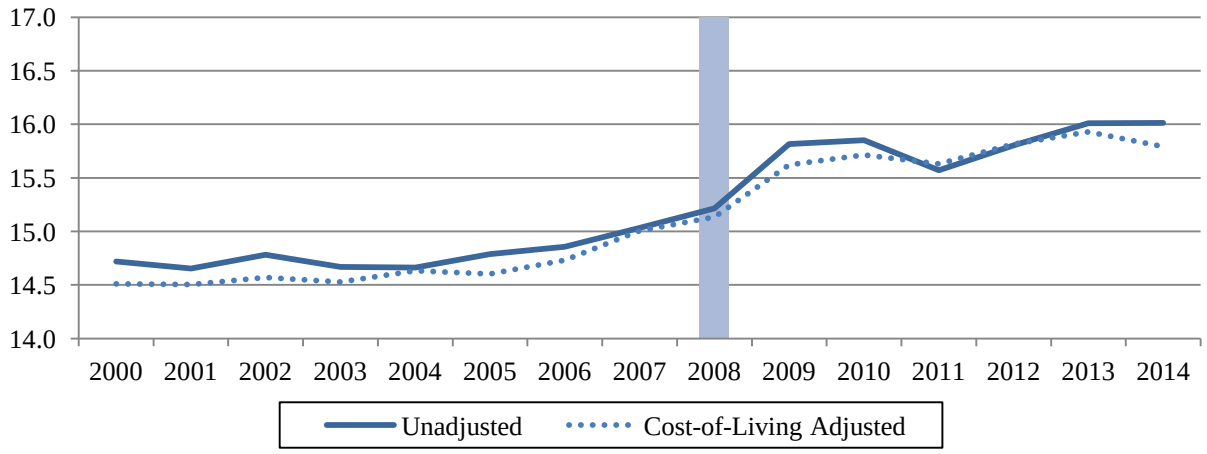
* CSLS calculations for Toronto and Ottawa are weighted averages of the Toronto and Ottawa price levels based on their share of the total populations of Toronto and Ottawa combined.
Note: The weighting procedure that is used for the inter-city indexes is based on expenditure shares. The expenditure share of a product from within a city is calculated by taking the total expenditure for that product in a given city and dividing that value by the aggregated expenditure for that product across all the published cities.
Source: CANSIM 326-0015.

It is important to note that cost-of-living adjustments will typically change the national cutoff. This is because cost-of-living adjustments affect the benchmark in two ways. First, the ordering of individuals from highest to lowest hourly wages is likely to change, as individuals in some provinces will see upward revisions in their hourly wages, while individuals in other provinces will see downward revision in their hourly wages. This will ultimately affect which individual represents the median, and subsequently, changes the benchmark (two-thirds of the median). Second, even assuming that the ordering of individuals from highest to lowest hourly wages does not change as a result of cost-of-living adjustments (extremely unlikely), it is still possible for the individual who represents the median to see an upward or downward revision of

their hourly wages depending on their place of residence. The only instance in which there would be no change in the cutoff after cost-of-living adjustments is when there is no reordering of individuals from highest to lowest hourly wages and the individual who represents the median lives in a province whose price index is 100 in that year.

Chart 31 shows the unadjusted and cost-of-living adjusted cutoffs over the 2000 to 2014 period. It is clear from this chart that the cutoffs are very similar over the entire time period, both in absolute terms and in terms of changes. In most years, the cost-of-living adjustment causes the benchmark to fall. The only years in which the benchmark rose after the adjustment were 2011 and 2012.

Chart 31: Impact of Cost-of-Living Adjustments on Cutoff for Canada, 2014 Dollars, 2000-2014



Source: CSLS calculations.

i. Incidence

Table 9 shows the incidence of low wages by province in Canada for employees aged 20 to 64 years between 2000 and 2014.[22] Chart 32 shows that in 2014 the cost-of-living adjustments had the greatest impacts on the Atlantic provinces, Quebec, and Manitoba. In particular, Prince Edward Island and New Brunswick saw their incidences of low-wage jobs revised downward by 6.4 percentage points (from 39.7 per cent to 33.4 per cent) and 6.0 percentage points (from 37.5 per cent to 31.5 per cent) respectively after the cost-of-living adjustment. Manitoba also saw a large downward revision in its incidence of low-wage jobs after the cost-of-living adjustments (6.4 percentage points from 30.8 per cent to 24.5 per cent). These downward revisions are certainly due in large part to the fact that these provinces had the lowest inter-city price indices in 2014: 94 in Quebec and Manitoba and 95 in Prince Edward Island and New Brunswick.

Only two provinces in Canada actually saw their incidences of low-wage jobs revised upward after the implementation of the cost-of-living adjustments: Ontario (1.3 percentage points from 29.1 per cent to 30.4 per cent) and British Columbia (0.2 percentage points from

[22] The time series for cost-of-living adjusted low-wage incidences and low-wage gaps by provinces starts in 2000 because data on inter-city price levels are not available prior to that year.

26.7 per cent to 26.9 per cent). This is not surprising given that these are the only two provinces whose price indices are above 100 in 2014 (103 in British Columbia and 106 in Ontario).

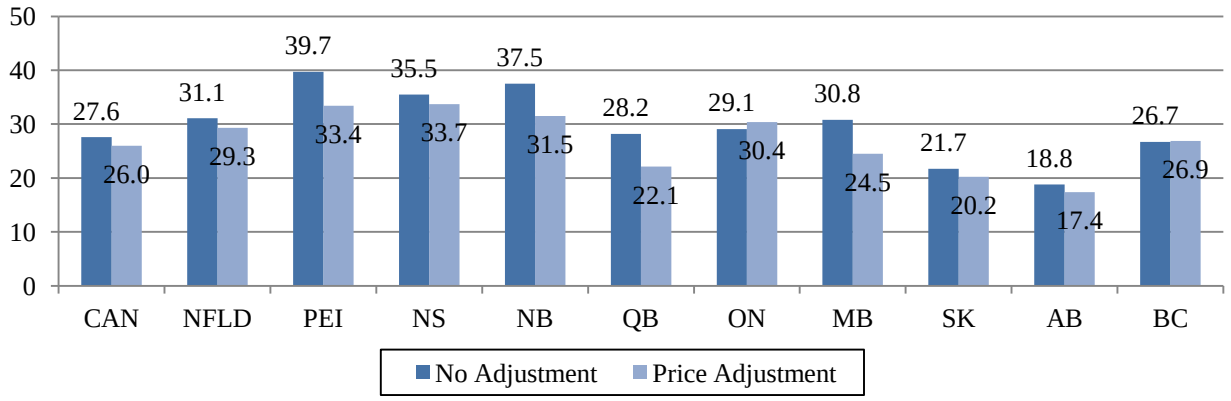
If we focus solely on the adjusted incidence of low wages, Nova Scotia had the highest incidence of low-wage jobs in 2014 at 33.7 per cent, while Alberta had the lowest incidence at 17.4 per cent. In 2000, Prince Edward Island had the highest incidence at 41.1 per cent, while British Columbia had the lowest incidence at 24.0 per cent. We also find that there were decreases in all provinces (except Ontario and British Columbia) between 2000 and 2014. If we break this down, we find declines in all provinces (except Ontario) over the 2000-2008 period and declines in all provinces (except Ontario and British Columbia) over the 2008-2014 period.

Table 9: Low-Wage Incidence by Province, Employees (20-64), Canada after Cost-of-Living Adjustment, 2000-2014

	CAN	NFLD	PEI	NS	NB	QC	ON	MB	SK	AB	BC
2000	26.4	40.2	41.1	39.5	34.2	25.4	26.1	27.7	28.3	24.3	24.0
2001	25.8	38.3	39.0	37.4	32.8	23.6	26.6	26.6	26.4	21.5	25.4
2002	26.1	37.5	38.0	38.7	34.3	24.0	26.9	25.5	25.7	22.1	25.5
2003	26.2	37.8	35.4	35.5	32.0	23.5	27.6	25.9	24.7	23.1	25.3
2004	26.3	38.0	34.5	36.2	33.5	22.3	28.0	26.1	25.5	23.2	26.3
2005	25.4	38.7	34.7	36.8	33.7	21.2	27.3	26.4	25.1	20.9	25.4
2006	25.3	37.7	36.5	36.9	32.8	22.0	27.2	24.6	23.7	18.6	26.3
2007	25.1	38.7	37.2	35.4	35.1	23.5	27.0	26.0	23.9	15.6	24.8
2008	24.6	36.5	35.8	35.9	32.2	23.3	27.2	25.2	21.9	15.6	22.2
2009	25.0	34.5	36.9	34.6	31.6	22.6	28.2	24.5	21.1	17.1	23.4
2010	25.8	34.0	34.0	34.5	30.4	23.0	30.1	23.9	18.7	16.8	24.6
2011	26.1	31.2	32.4	35.5	31.1	22.2	29.8	23.8	18.5	18.3	27.8
2012	26.6	30.5	31.9	35.8	32.6	22.0	30.9	24.7	20.3	18.1	28.7
2013	26.6	30.3	31.9	36.1	34.5	22.4	31.2	25.4	21.0	17.5	27.3
2014	26.0	29.3	33.4	33.7	31.5	22.1	30.4	24.5	20.2	17.4	26.9
00-14	-0.4	-10.9	-7.7	-5.8	-2.7	-3.2	4.3	-3.2	-8.1	-6.9	2.9
00-08	-1.8	-9.1	-12.9	-9.1	-5.7	-8.1	4.4	-9.1	-22.5	-35.8	-7.3
08-14	1.4	-19.7	-6.8	-6.0	-2.3	-5.1	11.6	-2.8	-8.0	11.5	21.1

Source: CSLS calculations.

Chart 32: Incidence of Low Wages, Canadian Provinces, Cost-of-Living Adjustment and No Cost-of-Living Adjustment, 2014



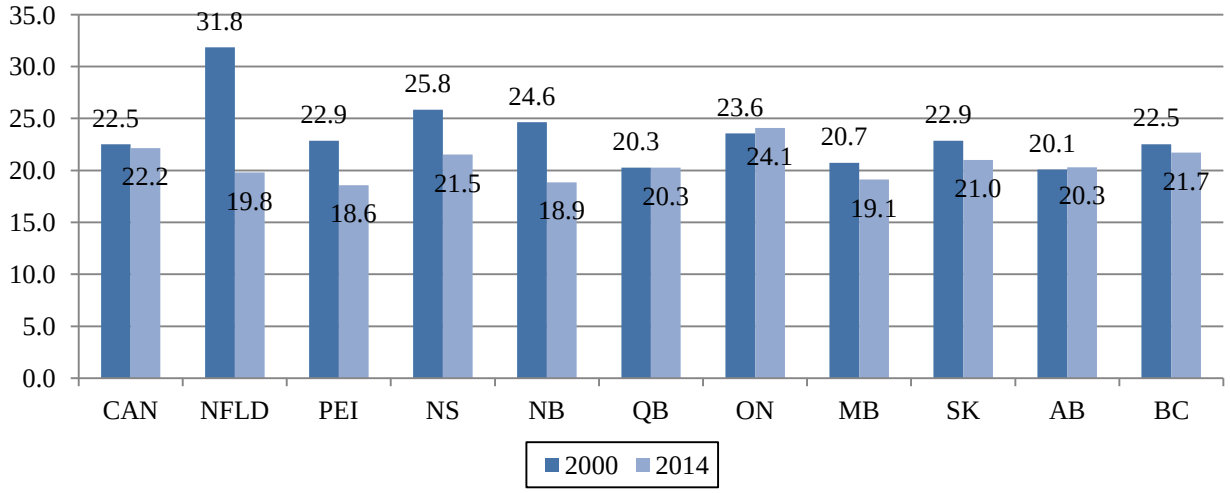
Source: CSLS calculations.

ii. Gap

In Chart 33, we calculated the low-wage gap by province after cost-of-living adjustments for 2000 and 2014. In 2014, Ontario had the highest low-wage gap (24.1 per cent), while Prince Edward Island had the lowest low-wage gap (18.6 per cent). In 2000, the province with the lowest low-wage gap was Alberta (20.1 per cent), while the province with the highest low-wage gap was Newfoundland and Labrador.

Over the 2000-2014 period, seven of ten provinces saw their low-wage gaps decline. Quebec, Ontario and Alberta saw increases. If we examine the pre- and post-2008 periods, we find that Quebec, Ontario, Alberta and British Columbia saw their low-wage gaps rise over the 2000-2008 period, while all other provinces saw declines. Over the 2008-2014 period, only Saskatchewan and Alberta saw increases.

Chart 33: Low-Wage Gap by Province (20-64), Canada, Cost-of-Living Adjustment, 2000 and 2014



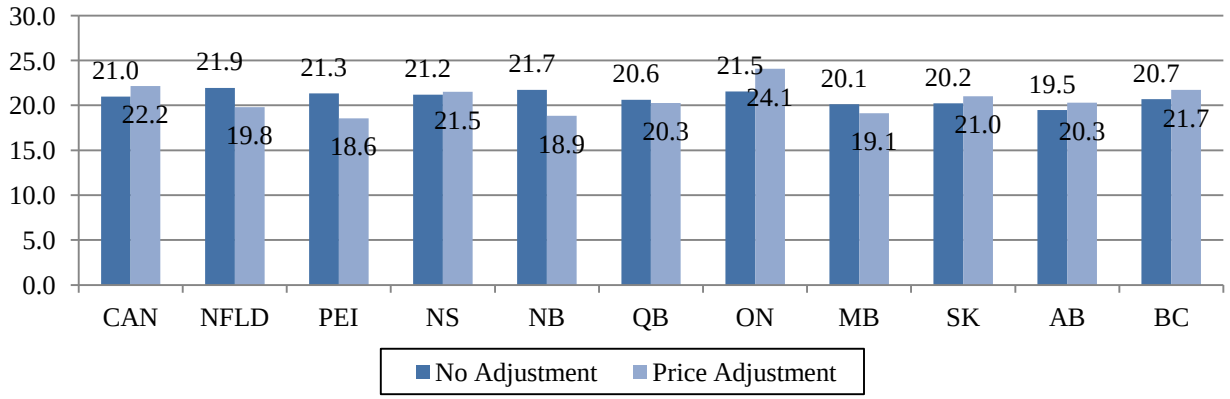
Source: CSLS calculations.

In five provinces, the low-wage gap in 2014 after cost-of-living adjustments was higher than prior to cost-of-living adjustments: Ontario, British Columbia, Nova Scotia, Saskatchewan and Alberta (Chart 34). All of these provinces had costs-of-living that were at or above the national average.

For the low-wage gap to increase after the cost-of-living adjustment, the fall in the average wages of individuals below the cutoff must be greater than the fall in the national cutoff itself, which was 1.4 per cent in 2014 (from $16.01 per hour to $15.79 per hour). In Ontario and British Columbia, all individuals saw their wages decline because these two provinces had price indices above 100 (103 in British Columbia and 106 in Ontario). Thus, it is not surprising that these provinces saw an increase in their low-wage gaps. In contrast, Nova Scotia, Saskatchewan and Alberta all had price indices of 100. This means that the average wages of individuals below the cutoff isn't falling as a result of the adjustment, but instead, the average wages of individuals below the cutoff is falling because individuals with wages between $15.79 per hour and $16.01 per hour are no longer pulling up the average. In the three provinces of interest, this impact was

larger than the fall in the cutoff itself. In particular, the change in the average wages of individuals in Nova Scotia was 1.8 per cent, while it was 2.4 per cent in Saskatchewan and 2.4 per cent in Alberta.

Chart 34: Low-Wage Gap, Canadian Provinces, Cost-of-Living Adjustment and No Cost-of-Living Adjustment, 2014



Source: CSLS calculations.

It was suggested earlier that the weighted national minimum wage is strongly correlated with changes in the low-wage gap in Canada. However, since minimum wages are legislated provincially, it is more informative to examine this relationship at the provincial level. In the panels of Chart 35 below, the low-wage gap and minimum wages are indexed to 100 in 2000 and the vertical axes are fixed between 50 and 160 to make differences across provinces and within provinces easier to observe.

These charts show that in most provinces there was almost no change in real minimum wages between 2000 and 2005 (give or take a year). This was complimented by almost no change in the low-wage gap. Subsequently, between about 2005 and 2010 (give or take a year), these provinces saw growth in real minimum wages, accompanied by a mildly declining low-wage gap. Finally, between about 2010 and 2014, there was stagnation in minimum wage growth and there was still very little change in the low-wage gap in most provinces.

Table 10: Correlation Coefficients of the Low-Wage Gap and Minimum Wages by Provinces, 2000-2014

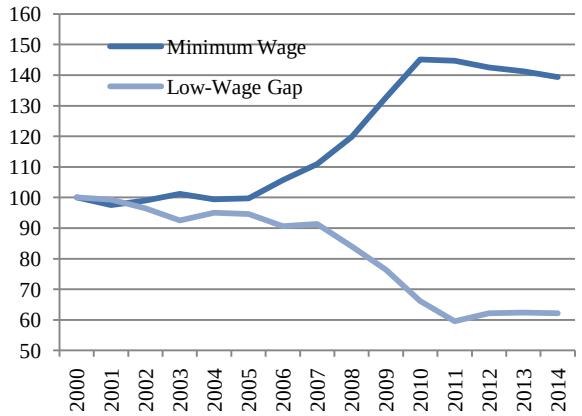
	Correlation Coefficent
Newfoundland and Labrador	-0.98
Prince Edward Island	-0.57
Nova Scotia	-0.92
New Brunswick	-0.88
Quebec	-0.51
Ontario	-0.47
Manitoba	-0.88
Saskatchewan	-0.87
Alberta	-0.48
British Columbia	-0.63

Source: CSLS calculations.

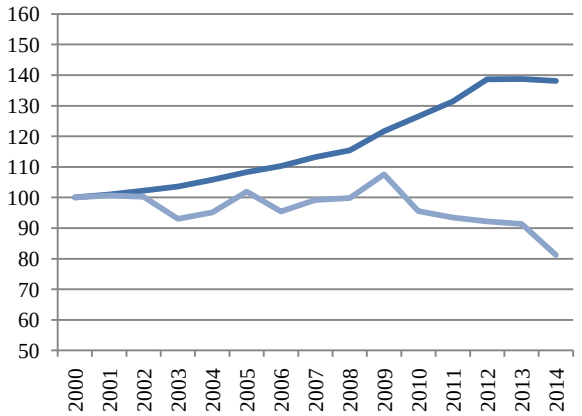
Simple correlation coefficients show that the levels of the two variables are quite strongly negatively correlated, ranging from negative 0.47 (Ontario) to negative 0.98 in Newfoundland and Labrador (Table 10). It is interesting to note that three of the four Atlantic provinces (Newfoundland and Labrador, Nova Scotia, and New Brunswick) have the strongest correlation coefficients, followed by two of the three prairie provinces (Manitoba and Saskatchewan).

Chart 35: Low-Wage Gap and Minimum Wages by Province, 2000=100, 2000-2014

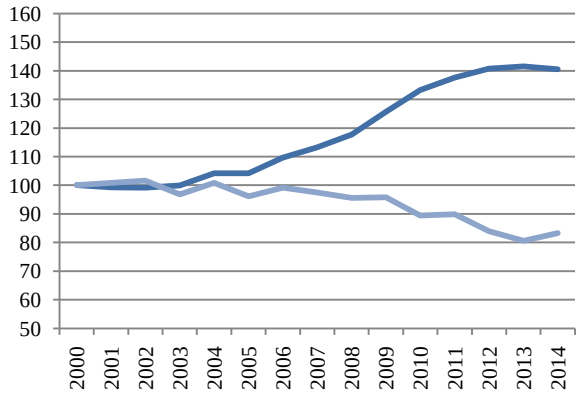
Panel A: Newfoundland and Labrador



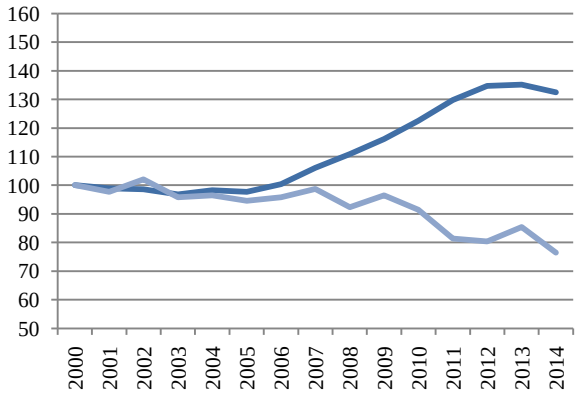
Panel B: Prince Edward Island



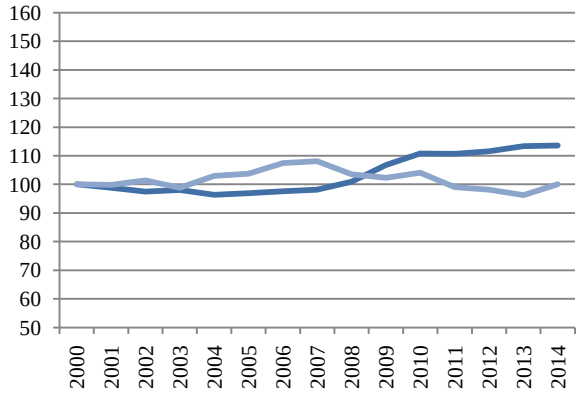
Panel C: Nova Scotia



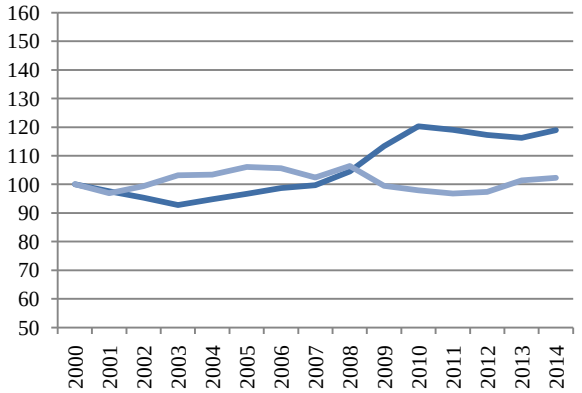
Panel D: New Brunswick



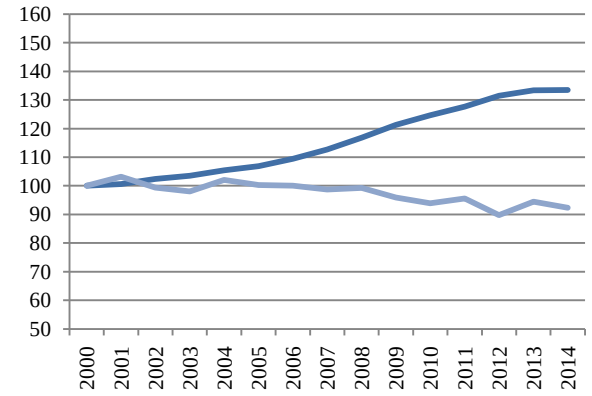
Panel E: Quebec



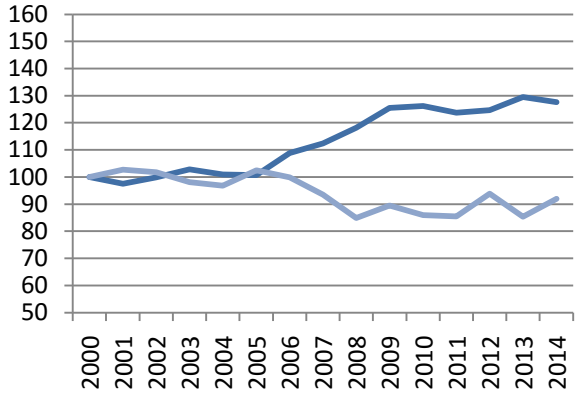
Panel F: Ontario



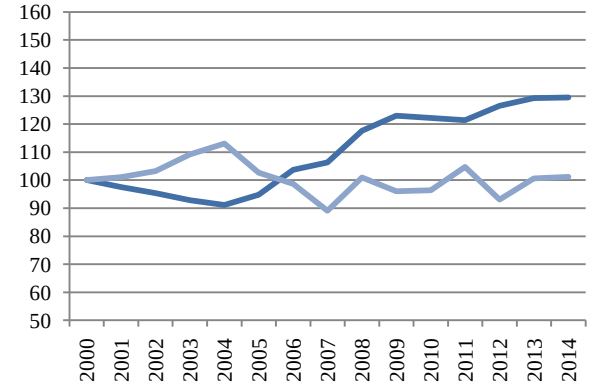
Panel G: Manitoba



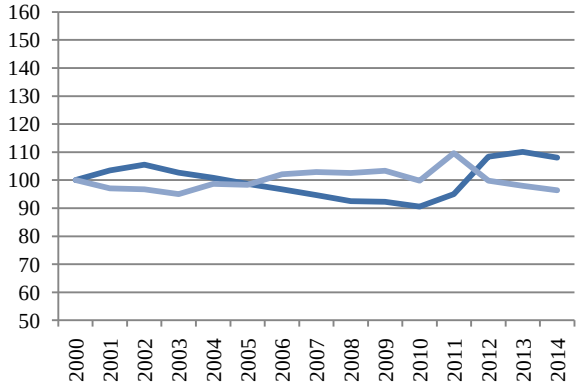
Panel H: Saskatchewan



Panel I: Alberta



Panel J: British Columbia



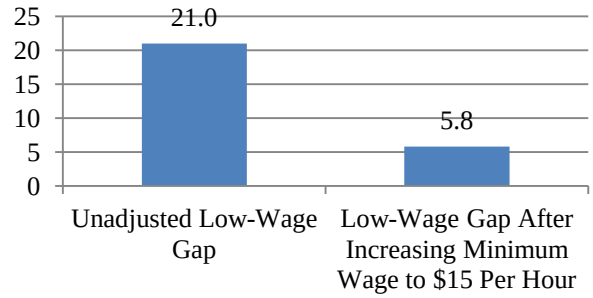
Source: CSLS calculations.

V. Implications of a $15 Minimum Wage

While pay is only one dimension of job quality, it is a very crucial determinant of living standards. Thus, it is not surprising that in conjunction with a growing interest in job quality there has been an uptick in discussions concerning minimum wages. In the United States, this has resulted in commitments to significantly increase minimum wages. For example, California and New York have "enacted legislation to raise the minimum wage to $15 [per hour] within six years" (Slater, 2016). This is notably higher than the current U.S national minimum wage of $7.25 per hour.

Since the argument for $15 per hour minimum wages has flooded into Canada (MacEwen, 2015), this section of the report investigates the impact of increasing the minimum wage in Canada to $15 per hour on the low-wage gap in 2014. The low-wage gap can be interpreted as the depth of low-wage jobs relative to the low-wage benchmark for the average low-wage worker.

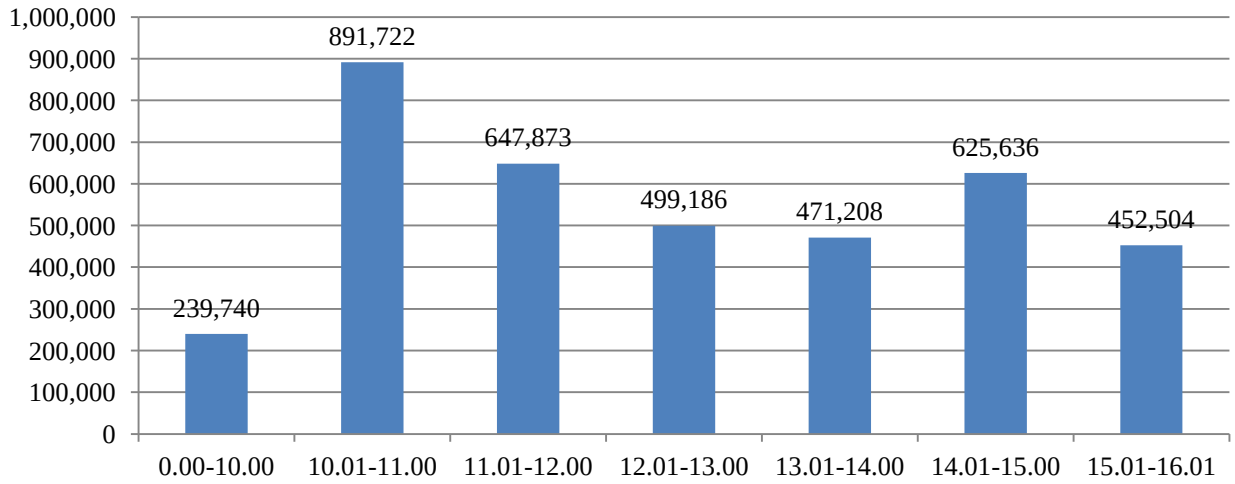
Chart 36: Impact of Increasing Minimum Wages to $15 Per Hour on the Low-Wage Gap, 2014



Source: CSLS calculations.

Since a $15 minimum wage is below the cutoff determined by median wages, there would be no change in the incidence of low-wage jobs in Canada if all workers earning less than $15 per hour moved to this minimum wage. There would, however, be drastic implications for the low-wage gap. In particular, in 2014, the low wage gap would have plummeted from 21.0 per cent to 5.8 per cent in 2014 had there been a $15 per hour minimum wage (Chart 36). This is because there are 3,827,869 individuals earning below the benchmark, of which 88.2 per cent (or 3,375,365) earned less than $15 per hour in 2014 (Chart 37). With a change to $15 per hour minimum wages, all of these 3,375,365 workers would see their hourly wages rise to $15 per hour.

Chart 37: Number of Employees (20-64) in Low-Wage Jobs by Wage, 2014



Source: CSLS calculations.

It is important to point out that these calculations are only possible because the $15 per hour cutoff is below the cutoff determined by two-thirds of median hourly wages for full-time employees aged 20 to 64 years. If this were not the case, increasing the minimum wage to $15 per hour would subsequently affect this cutoff (which is determined by two-thirds of median hourly wages for full-time employees aged 20 to 64 years) because the median might change. It is also important to note that this analysis depends upon the assumption that there is no

behavioural response to this minimum wage increase among either labour supply or labour demand, which is highly unlikely. In particular, it is possible that there would be an increase in the labour force participation rate in the event of an increase in the minimum wage to $15 per hour. It is also possible that capital-labour substitution rates would change. Furthermore, there would likely be a change in the wages of other individuals in the wage distribution as a result of this increase (there would be pressure to increase relative wages).

VI. Alternative Cutoffs for Low-Wage Employment in Canada

A. Alternative Cutoffs

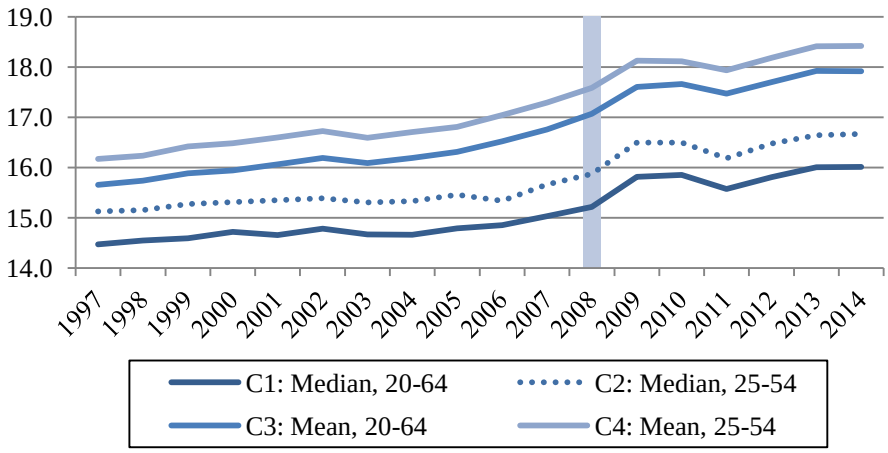
During our analysis, we created four different cutoffs by changing the age group in consideration and switching between median hourly wages and mean hourly wages. The four cutoffs are detailed below, the first of which is our benchmark:

1. 2/3 of the median hourly wage for full-time (35 or more hours) employees (20 to 64 years)
2. 2/3 of the median hourly wage for full-time (35 or more hours) prime-age employees (25 to 54 years)
3. 2/3 of the mean hourly wage of full-time (35 or more hours) employees (20 to 64 years)
4. 2/3 of the mean hourly wage of full-time (35 or more hours) prime-age employees (25 to 54 years)

The four cutoffs are shown in Chart 38 and Table 11. The cutoff determined by median hourly wages for full-time employees aged 20 to 64 years, referred to as cutoff (1), was $16.01 (2014 dollars) per hour in 2014, up $1.55 per hour (or 10.6 per cent) from $14.47 in 1997. Throughout the entire period between 1997 and 2014, cutoff (1) was below the other three cutoffs. This is because cutoff (1) is based on the median and not the mean, which tends to be pulled upward by high wage outliers and by the fact that cutoff (1) is for employees aged 20 to 64 years and not for employees aged 25 to 54 years, who tend to earn more on average than workers in the 20-24 years and 55-64 years age groups.

The highest cutoff is that determined by mean hourly wages for full-time employees aged 25 to 54 years, referred to as cutoff (4). This cutoff was $18.42 per hour in 2014 up $2.24 per hour from $16.17 in 1997. The gap between cutoff (1) and cutoff (4) increased by $0.70 per hour between 1997 and 2014 from $1.70 per hour to $2.40 per hour.

Chart 38: Cutoffs for Low-Wage Employment, 2014 Dollars Per Hour, Canada, 1997-2014



Source: CSLS calculations.

It is important to note that cutoff (1) differs from cutoff (4) along two dimensions: age and measure of central tendency. Hence, differences in their growth rates over the 1997-2014 period can be caused by different rates of growth for each of these dimensions. However, Table 11 shows that there is very little difference between the growth rates of the median cutoff by age group and the growth rates of the mean cutoff by age group, while there appears to be a large difference between the growth rates of the mean and median for the same age group. For example, the cutoff determined by the median for those aged 20-64 years grew by 10.6 per cent over the period, while the cutoff determined by the median for those aged 25-54 years grew by 10.2 per cent. Similar observations could be made for the growth of the cutoff determined by the mean by age group. In contrast, the cutoff determined by the median for those aged 20-64 years (10.6 per cent) grew 3.8 percentage points less quickly than the cutoff determined by the mean for the same age group (14.4 per cent). This illustrates that the entirety of the difference over the 1997-2014 period between rates of growth for cutoff (1) and cutoff (2) is caused by the change from the median to the mean, since the change between age groups resulted in only minor differences in the rate of change.

Table 11: Cutoffs for Low-Wage Employment, 2014 Dollars Per Hour, Canada, 1997 and 2014

		1997 ($)	2008($)	2009($)	2014($)	Δ	%Δ 97-14	%Δ 97-14	%Δ 97-09	%Δ 09-14	%Δ 08-09
		Absolute					Total		Compound		
Median	(1) 20-64	14.47	15.21	15.82	16.01	$1.54	10.6	0.60	0.74	0.25	3.96
	(2) 25-54	15.13	15.87	16.50	16.67	1.54	10.2	0.57	0.72	0.21	3.92
Mean	(3) 20-64	15.66	17.07	17.60	17.91	2.25	14.4	0.80	0.98	0.35	3.15
	(4) 25-54	16.17	17.58	18.13	18.42	2.25	13.9	0.77	0.96	0.32	3.09
		Relative									
Median	(1) 20-64	100.0	100.0	100.0	100.0						
	(2) 25-54	104.6	104.3	104.3	104.1						
Mean	(3) 20-64	108.2	112.2	111.3	111.9						
	(4) 25-54	111.7	115.6	114.6	115.1						

Source: CSLS calculations.

It is interesting to note that the growth rate for all four cutoffs shows a marked decline after 2009 (Table 11). In particular, between 1997 and 2009, cutoff (1) grew by 0.74 per cent per year, while it grew only 0.25 per cent per year between 2009 and 2014. This reflects slower growth in both median and mean hourly wages.

It is also interesting to note the larger increase in cutoff (1) and cutoff (2) compared to cutoff (3) and cutoff (4) between 2008 and 2009. In particular, between 2008 and 2009, cutoff (1) and cutoff (2) grew by 4.0 per cent and 3.9 per cent respectively, while cutoff (3) and cutoff (4) grew by only 3.2 per cent and 3.1 per cent respectively. In general, we would not expect to see wage growth during a recession. However, Statistics Canada's CANSIM Table 282-0151 confirms that the median hourly wage rate for all employees aged 25-54 years rose from $20.72 per hour to $21.48 per hour between 2008 and 2009. This may suggest that a number of people with low hourly earnings dropped out of the labour force, thereby pushing the median upward. In this way, the median may occasionally be more sensitive to massive layoffs of low-skill and low-wage workers than the mean.

B. Impact of Alternative Cutoffs

In this section, we perform a sensitivity analyses by showing how the results for low-wage jobs change as a result of using cutoff (4) instead of cutoff (1).

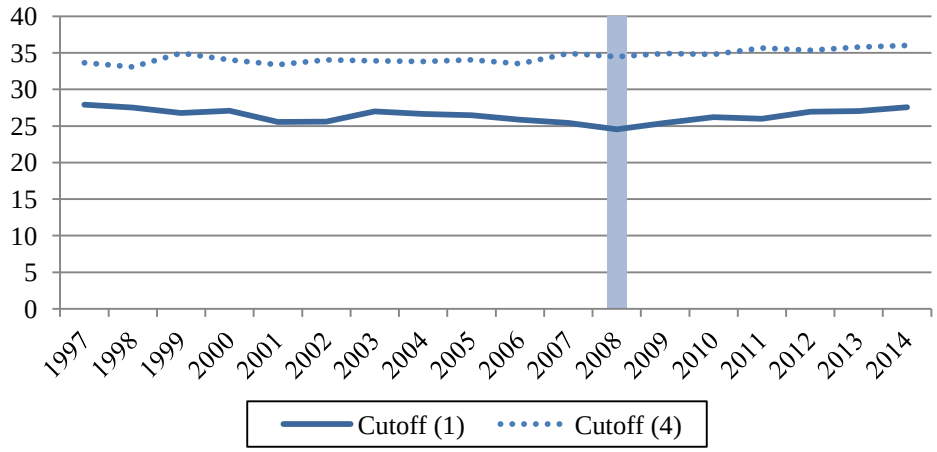
i. Incidence

Chart 39 shows the incidence of low-wage jobs among employees aged 20 to 64 years in Canada between 1997 and 2014 based on cutoff (1) and cutoff (4). It is not surprising that the low-wage incidence determined by cutoff (4) is higher than that determined by cutoff (1). The impact of using cutoff (4) instead of cutoff (1) is quite large, as it increases the incidence of low-wage jobs among employees aged 20 to 64 by 8.4 percentage points from 27.6 per cent to 36.0 per cent in 2014. The difference between the incidence of low-wage jobs under cutoff (1) and cutoff (4) has grown to this level from 5.8 percentage points in 1997 (33.7 per cent versus 27.9 per cent). The growth in this difference is not surprising, given that the difference between cutoff (1) and cutoff (4) has increased from $1.70 per hour in 1997 to $2.40 per hour in 2014. This is because cutoff (4) grew by 13.9 per cent over this period, while cutoff (1) grew by only 10.6 per cent. The greatest divergence between the two time series appears to have occurred in 2008 at 9.9 percentage points.

It is important to note that since cutoff (2) and cutoff (3) fall between cutoff (1) and cutoff (4), the incidence of low wages under cutoff (1) acts as a lower bound for the incidence of low wages in Canada as determined by these four cutoffs, while cutoff (4) acts as an upper bound.

Over the 1997-2008 period, the incidence of low wages based on cutoff (1) decreased by 12.0 per cent. In contrast, over this same time period, the incidence of low wages based on cutoff (4) increased by 2.4 per cent. Over the 2008-2014 period, the incidence of low wages based on cutoff (1) increased by 12.3 per cent, while the incidence of low wages based on cutoff (4) increased by only 4.5 per cent.

Chart 39: Low-Wage Incidence, Employees (20-64), Canada, Cutoff (4) and Cutoff (1), 1997-2014



Source: CSLS calculations.

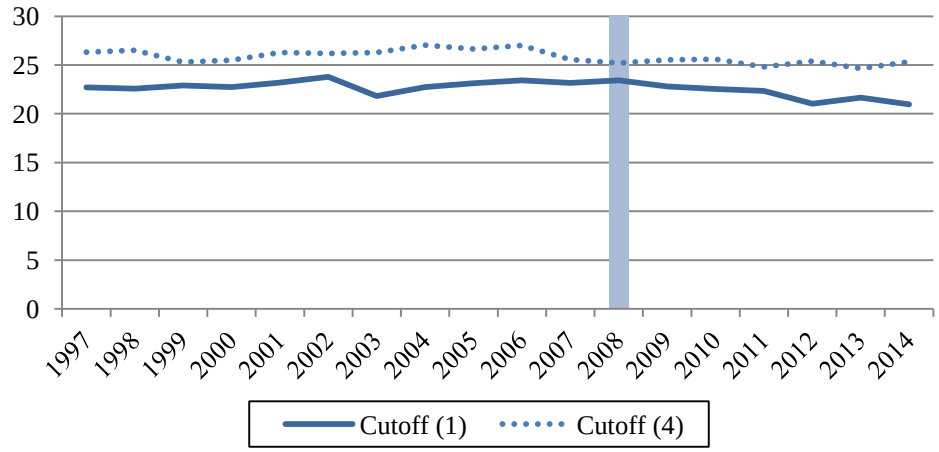
ii. Gap

Chart 42 shows that the low-wage gap under cutoff (4) is higher than the low-wage gap under cutoff (1) over the entire 1997-2014 period. This is not surprising given that the low-wage cutoff determined by cutoff (4) is higher than that determined by cutoff (1).

Over the 1997-2014 period, the low-wage gap decreased from 22.7 per cent to 21.0 per cent for cutoff (1), while it decreased from 26.3 per cent to 25.3 per cent over this same time period for cutoff (4). Since the low-wage gap under cutoff (1) decreased more than cutoff (4), the difference between the two low-wage gaps increased from 3.6 percentage points to 4.4 percentage points.

Between 1997 and 2008, the low-wage gap based on cutoff (1) increased mildly (3.1 per cent), while it decreased quite significantly between 2008 and 2014 (10.5 per cent). The low-wage gap based on cutoff (4) showed exactly the opposite, decreasing by 4.2 per cent between 1997 and 2008 and increasing by 0.4 per cent between 2008 and 2014.

Chart 40: Low-Wage Gap, Employees (20-64), Canada, Cutoff (4) and Cutoff (1), 1997-2014



Source: CSLS calculations.

VII. Comparative Analysis

In this section, we compare the results of our job quality analysis regarding low-wage employment with job quality measures from the Canadian Imperial Bank of Commerce (CIBC) and the OECD.

A. CIBC's Employment Quality Index

The Economics Department of CIBC produced a measure of employment quality for many years (although it has not been updated since 2015). In the past, this index received a lot of media attention.

In assessing job quality, the CIBC Employment Quality Index (EQI) focuses on four sub-measures: "full-time versus part-time distribution; self-employment versus paid employment distribution; job stability; and the level of compensation associated with a given job" (CIBC, 2008:4). The rationale provided is that "a full-time, paid employee who enjoys above-average compensation and is unlikely to lose his/her job in the foreseeable future is in a better position to maintain or improve his/her standard of living and is somewhat more immune to economic shocks" (CIBC, 2008:4). The employment quality index is defined as follows:

EQI =
0.15 x (full-time/part-time) + 0.15 x (paid employment/self-employment)
+
0.7 x (weighted ratio of employment in high-paying & stability industries to jobs in low-paying & stability industries).

The first term is based on the idea that "the economic impact of a given rise in overall employment is not identical if most of the new jobs are part-time positions rather than full-time positions" (CIBC, 2008:4). CIBC focuses on all part-time jobs, instead of involuntary part-time

jobs, because their main goal is "compensation and stability…not the reasons behind the decision to work part-time" (CIBC, 2008:4). Due to this logic, the first term is the ratio of full-time employment to part-time employment. If the number of part-time jobs increases relative to full-time jobs, then the EQI will decrease by definition.

The second term is based on the concept that "self-employment should be treated differently than paid employment…because [even though] many of those who are self-employed are satisfied with their current position, the reality is that there [are] financial sacrifices" (CIBC, 2008:5). Due to this rationale, the second term is the ratio of paid employment to self-employment. If self-employment increases relative to paid employment, then the EQI will decrease by definition. CIBC includes the term despite their recognition of the fact that "no less than two-thirds of the self-employed considered themselves as *life-stylers* as opposed to *value builders*" (CIBC, 2008:5).

The final term is based on the logic that a job with a higher wage and long-term employment opportunities (or stability) is better than a job with low-pay and short-term employment opportunities. This measure is composed of a compensation sub-measure and a stability sub-measure.

The compensation sub-measure is a weighted ratio of high-paying and low-paying jobs using a sector's deviation from the median weekly wage as the assigned weight for each sector.

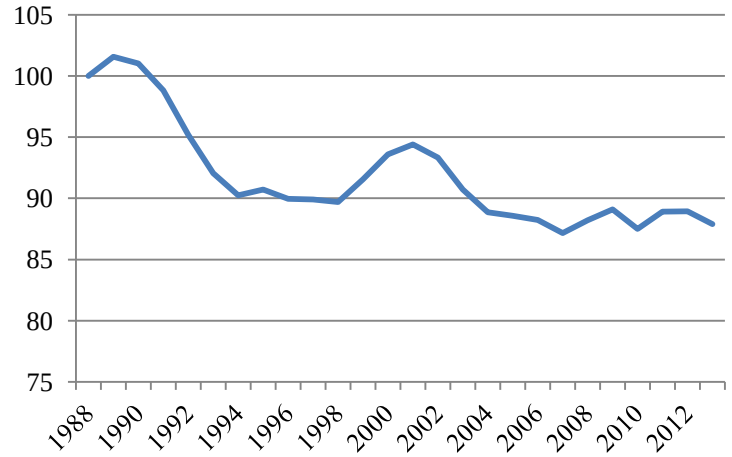
The stability sub-measure focuses on the "average complete length of a new job" instead of only job tenure (CIBC, 2008:7). Essentially, this sub-measure looks at the "likelihood that an individual who started a new job will keep it for more than six months" (CIBC, 2008:7). It is calculated as the "ratio of the number of individuals reporting to be employed between six and twelve months at a given point in time relative to the number of individuals that reported being employed for six months or less, six months earlier" (CIBC, 2008:7). In more intuitive terms, this stability sub-measure can be seen as the "conditional probability of surviving the *x*th month of employment given being employed during the previous time interval" (CIBC, 2008:7).

Since this measure of job stability is extremely difficult to calculate at the industry level, CIBC's EQI uses a "rolling standard deviation of log first differences of the employment series in each industry category" (CIBC, 2008:7). This method gives each industry a "stability weight, which is simply the deviation from the average unconditional volatility at time *t* for the economy as a whole" (CIBC, 2008:7). These weights are then used to calculate the weighted ratio of higher stability jobs to lower stability jobs. To combine the compensation and stability sub-measures into one measure, CIBC's EQI assigns a weight of 30 per cent to the stability measure and 70 per cent to the compensation measure. These weights were obtained from "an analysis of the residuals of a regression of job growth over real wages and salaries growth" (CIBC, 2008:7).

After the calculation of all of these measures of job quality, CIBC's EQI combines them into one aggregate measure. The full/part-time status term and paid/self-employment status term are given weights of 0.15 per cent respectively, while the compensation and stability term is given a weight of 0.70 per cent.

At the aggregate level, CIBC's EQI shows employment quality on a clear, and strikingly large, downward trend between 1988 and 2014 (Chart 41). According to their measure, employment quality was 12.1 per cent lower in 2014 than in 1988.

Chart 41: CIBC EQI, 1988=100, 1988-2014



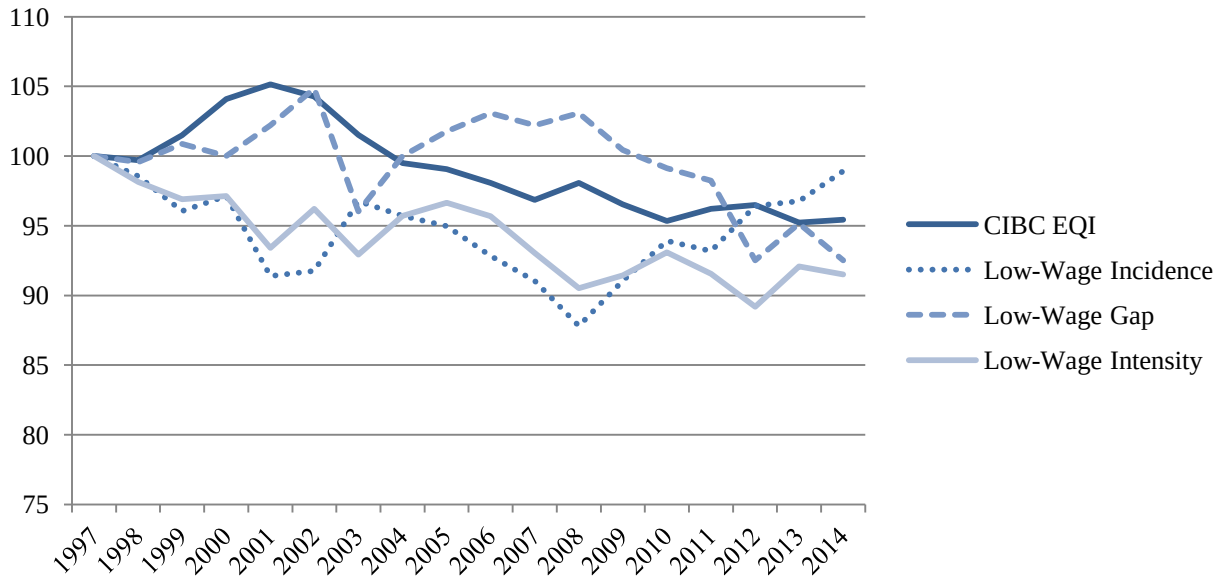
Source: CIBC (2015)

During the time frame that is pertinent to this report, employment quality according to the CIBC EQI had an upward trend between 1997 and 2001, and a strong downward trend between 2001 and 2014 (Chart 42). This differs from our three measures of job quality. In particular, the low-wage incidence decreased between 1997 and 2008, seven years longer than CIBC's EQI. It only began to increase in the 2008-2014 period. Furthermore, the low-wage gap showed a fairly steady decrease over the entire period between 1997 and 2014, with only a few year-over-year increases. Finally, our aggregate measure of job quality, the low-wage intensity, decreased slowly but extremely steadily over the entire 1997-2014 period. There were no significant increases or decreases, even on an annual basis. Even more importantly, in 2014, the CIBC EQI was 4.6 per cent lower than in 1997 (to be interpreted as deterioration), while our estimates of job quality (incidence, gap and intensity) showed a 1.1 per cent, 7.5 per cent and 8.5 per cent decrease (to be interpreted as improvements).

There are, however, extremely important definitional differences between our measure of job quality and the CIBC EQI.[23] These differences mean that these measures are not directly comparable.

[23] Cross (2015) suggests that CIBC's job quality index is subpar. We are discussing it because it receives media attention and therefore may influence public perception of trends in job quality.

Chart 42: CIBC Employment Quality Index and CSLS Low-Wage Incidence, 1997=100, 1997-2014



Source: CIBC (2015) and CSLS calculations.

For example, CIBC's data shows that since the late-1980s, the "number of part-time jobs has risen much faster than the number of full-time jobs" (CIBC, 2015). However, this focuses exclusively on the supply of part-time and full-time jobs, without considering whether the demand for full-time jobs relative to part-time jobs has been falling. It is possible that there has also been a shift on the labour supply side to an interest in more part-time positions.

CIBC's EQI also considers the split between self-employment and paid-employment. Our results, however, explicitly exclude self-employment, so there is no comparison to be made. We exclude self-employment because many individuals choose to be self-employed because of the freedom and independence it affords, despite the potential reality of lower wages.

Finally, CIBC's EQI also considers the sectoral composition of full-time employment. Their data suggest that the number of jobs in low-paying industries has risen faster than the number of jobs in mid-paying and high-paying industries. Their data for jobs in low-paying industries, however, are based on 85 per cent of median wages, while our data is based on two-thirds of median wages. Hence, there are certain jobs which would fall into low-paying industries according to the CIBC EQI, but would not be considered low-paying jobs in our calculations.

Arguably, the cutoff used by CIBC's EQI for low-paying industries is too high. In particular, according to data from the LFS, the median wage for full-time employment for those aged 20 to 64 years was $24.02 per hour. Using CIBC's EQI, this implies a cutoff for jobs in low-paying industries of approximately $20.41 per hour, or $40,826 at 2,000 hours per year. For many individuals, this is not a meagre annual salary.

The view presented by CIBC's EQI that there has been deterioration in job quality is partly founded upon a negative view of part-time jobs and self-employment. We do not believe that part-time jobs are inherently low-quality jobs, especially if individuals are willing and

interested in working part-time (e.g. students or mothers with newborn children). Part-time jobs should only be considered low-quality jobs if the employee is not satisfied with his working hours (or his wages), which are concepts that are captured by involuntary part-time and hourly wages in the LFS. We also do not believe that an increase in the rate of self-employment is inherently an indication of deterioration in job quality. The only time in which self-employment may have negative connotations is during recessions or poor growth periods, when workers view self-employment as a shelter until the economy improves.

B. OECD's Low-Wage Data

The CSLS and the OECD use the same basic definition for low-wage jobs, namely two-thirds of median wages/earnings. The differences lie in the universes that are used to define the cutoff and to calculate the incidence. In particular, the OECD defines the incidence of low pay as the share of full-time workers earning less than two-thirds of gross median annual earnings of all full-time employees, while we define the incidence of low pay (wages) as the share of all employees earning less than two thirds of median hourly wages for full-time employees aged 20 to 64 years.

There are a number of important distinctions to be noted in these definitions. In particular, in terms of the *cutoff*:

- in contrast to the OECD, our cutoff does not include self-employed workers;
- our cutoff focuses on median hourly wages for full-time employees aged 20 to 64 while the OECD focuses on all full-time workers of all ages; and
- the OECD uses annual earnings, while we use hourly earnings.

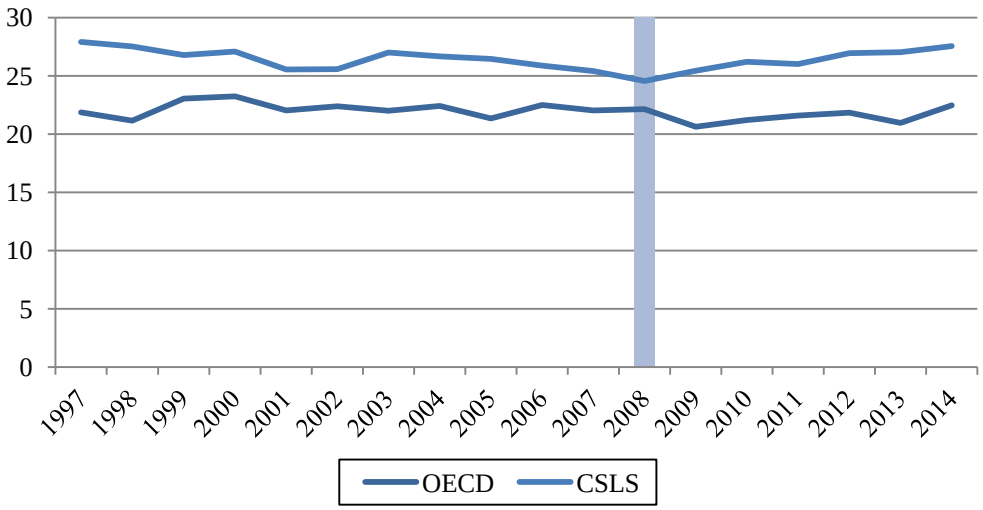
In terms of the calculation of the *incidence*:

- the OECD calculated the incidence of low pay for full-time workers, while we calculated our estimates for full-time and part-time employees;
- the OECD generates the incidence of low pay for full-time workers of all ages, while we focused on all employees aged 20 to 64 years;
- the OECD included both self-employed workers and employees, while our calculations focuses on employees only; and
- the OECD uses annual earnings, while we use hourly earnings

Chart 43 shows the OECD's incidence of low-pay (available through OECD.Stat) alongside our calculations for the incidence of low wages. In 2014, our estimates suggested an incidence of low wages of 27.6 per cent, while the OECD suggested 22.5 per cent, resulting in a 5.1 percentage point gap. In 1997, this gap was 6.0 percentage points since we estimated the incidence of low wages at 27.9 per cent, while the OECD estimated this at 21.9 per cent. Hence, over time, it appears that our estimates and those of the OECD have remained at a fairly stable distance from one another.

It is interesting to note that over the 1997-2008 period, the OECD saw a mild increase its incidence of low pay (1.2 per cent), while our estimates saw a large decrease (12.0 per cent). Furthermore, over the 2008-2014 period, the OECD estimates of low pay increased only mildly (1.5 per cent), while our estimates increased much more rapidly (12.3 per cent).

Chart 43: OECD and CSLS Low-Wage Incidence, Canada, 1997-2014



Source: OECD (2016).

It is likely that the small differences on a year-to-year basis that do exist between these two estimates arise because of differences in the universes under consideration. In particular, the definitional differences in terms of the calculation of the cutoff and the calculation of the incidence of low pay affect the comparability of our figures with those of the OECD. Nevertheless, both estimates of the incidence of low wages are valid. An advantage of our estimates over those of the OECD is our detailed breakdown by gender, age, educational attainment, industry, and occupation. Furthermore, we provide estimates of the low-wage gap and the intensity of low wages, whereas the OECD does not.[24]

VIII. Conclusion

Job quality is a complex, subjective concept. However, one important aspect of job quality (arguably the most important aspect) is pay. In this report, we provide estimates of the incidence of low-wage jobs based on two-thirds of median hourly wages. This definition is used by the OECD. We also introduce two novel concepts: the low-wage gap and the intensity of low wages. These measures parallel the poverty gap and poverty intensity, which have been used in the CSLS Index of Economic Well-Being for well over two decades. To our knowledge, this is the first study to produce estimates of these measures for low-wages.

In addition to presenting estimates of the incidence of low wages and the low-wage gap for all employees aged 20 to 64 years, we also provide these estimates for a variety of different subgroups, including gender, age, educational attainment, industry, occupation, and employment status.

[24] In principle, the OECD could also create these measures, which would allow for cross-country comparisons.

We find that 27.6 per cent of employees aged 20 to 64 years had low-wage jobs in 2014, down 0.3 percentage points from 27.9 per cent in 1997. We also find that the low-wage gap declined during this period, from 22.7 per cent in 1997 to 21.0 per cent in 2014. Given that both components of the intensity of low wages decreased, it is not surprising that low-wage intensity declined from 6.3 in 1997 to 5.8 in 2014. Intuitively, this means that slightly more than one in four employees aged 20 to 64 years were considered low-wage in 2014 and that the hourly wages for this one person were, on average, approximately one half of median hourly wages.

We also find that over the 1997-2008 period, the incidence of low-wage jobs decreased, while it increase over the 2008-2014 period. This is distinct from the mild increases in the low-wage gap over the 1997-2008 period and the large declines over the 2008-2014 period.

When broken down by gender, we find that females had a low-wage incidence that was 1.5 times higher than males. In contrast, the low-wage gaps for women and for men were more alike. Furthermore, young workers and middle-aged/older workers had a similar dynamic: young worker low-wage incidence was approximately 2.5 times higher than middle-aged worker low-wage incidence and older worker low-wage incidence, while their low-wage gaps were much more comparable. Finally, similar to the observations for gender and age, part-time workers faced a low-wage incidence in 2014 that was nearly 2.5 times higher than that faced by full-time workers, but their low-wage gap was closer to that of full-time workers.

This suggests that in general, both personal characteristics and job characteristics are important in determining the incidence of low-wage jobs, while job characteristics matter a lot more than personal characteristics in determining the low-wage gap. We also find that personal characteristics do not seem to matter in determining the trend of the incidence and the gap over time, while job characteristics can matter, as short- and long-term movements in certain occupations and industries did not mimic the overall aggregate trends.

Since labour market experiences across Canada are extremely divergent, we chose to explore differences in low-wage conditions by province. One major innovative approach that we introduce is a cost-of-living adjustment to reflect the massive differences in prices across Canada. After adjusting for prices, we find that Alberta had the lowest incidence of low-wage jobs (17.4 per cent) in 2014, while Nova Scotia had the highest incidence (33.7 per cent). We also find that the lowest low-wage gap was seen in Prince Edward Island at 18.6 per cent, while the highest low-wage gap was seen in Ontario at 24.1 per cent. Furthermore, over the 2000-2014 period, only two provinces saw increases in their incidences of low wages (Ontario and British Columbia), while only two provinces saw their low-wage gaps increase (Ontario and Alberta).

In summary, we find that the low-wage jobs landscape has improved over the 1997-2014 period, but we also find that there are important differences between key subgroups (male/female, part-time/full-time, young/middle-aged/old) in terms of their incidences of low wages. There are also important differences across provinces. Surprisingly, however, low-wage gaps are strikingly similar throughout the entire 1997-2014 period regardless of the subgroup considered. This is likely driven by the fact that within the low-wage category an individual's socio-economic profile is less significant in determining hourly earnings than it is outside of the low-wage category.

Future Research

In this paper, there were a number of instances where potential explanations were suggested, but not verified, since they were out of the scope of this project. Furthermore, there were cases where further investigation is limited by data availability. This section will highlight these future research areas, provided that when data are a limitation, these data are made available in the future.

- This report provides estimates up to 2014. Even though measures of low-wages tend to be fairly stable year-over-year, it is important to continue to keep track of developments at the aggregate level and among various subgroups, especially given the implications for certain provinces of the dramatic plunge in the oil price. Thus, updating these estimates as new data become available will be informative.
- In this report, it was shown that there is an inverse relationship between the incidence of low wages and the low-wage gap on an annual basis. It was suggested that the incidence of low wages increases while the low-wage gap decreases because of workers with an hourly wage close to the cutoff. This hypothesis cannot be confirmed unless longitudinal data with hourly wages becomes available in Canada.
- This report shows that the low-wage gap is fairly similar across different socio-economic dimensions (gender, age, educational attainment, etc.). It was suggested that this is because socio-economic characteristics are less determinative of the low-wage gap than of the incidence of low wages. It would be interesting to investigate this hypothesis in more detail. In particular, does the human capital model work as strongly for individuals who earn below two-thirds of median hourly wages? Do individuals face identical wage distributions below two-thirds of median hourly wages, regardless of their socio-economic profiles?
- Two very important socio-economic dimensions that were excluded from this analysis due to data availability are Aboriginal and immigrant status. Given that these two characteristics are important in determining other economic outcomes, it is likely that they are also important in determining the incidence of low wages. It is unclear if they would be important determinants for the low-wage gap. Future work in this area would be rewarding, assuming data become available.
    - If data on immigrant status were obtained, it would be interesting to investigate our hypothesis that immigrants with high levels of education in low-skill jobs are contributing to the explanation for why the low-wage gap does not differ greatly by educational attainment.
- We showed that Ontario and British Columbia were the only two provinces to show increases in the incidence of low wages between 1997 and 2014. It was suggested that the decline of manufacturing in Ontario could partially explain this result, but we did not have a hypothesis for British Columbia. Future work in this area is needed.
- We used national Consumer Price Index numbers to convert nominal hourly wages into 2014 dollars. It would be better to convert nominal hourly wages into 2014 dollars using the consumer price index for the province of residence of each individual. It would also be better to convert provincial minimum wages to 2014

dollars using provincial CPIs. This would improve the quality of the data and this would also help clarify relationships between the low-wage gap in 2014 dollars and the minimum wage in 2014 dollars.

- In 1997, there was much more variability across provinces in the low-wage gap than in 2014. In particular, there was an 11.7 percentage point gap between the highest low-wage gap (in Newfoundland and Labrador at 31.7 per cent) and the lowest low-wage gap (at 20.0 per cent in British Columbia). It is unclear why there is more variation in 2014 than in 1997 across provinces in the low-wage gap. Future research might be able to shed some light on this change.
- Since both personal characteristics and job characteristics are important in determining the incidence of low-wage jobs, while job characteristics are more important in determining the low-wage gap, it would be informative to quantify these relationships using regressions on the individual level data. For example, it would be interesting to know what per cent of the variation in the incidence and in individual-level gaps are explained by the various characteristics.
- In general, the results of this report suggest that the incidence and gap are negatively correlated over time, but they appear to be positively correlated across industries and occupations (at least in 2014). It would be informative to compute cross-sectional correlations at each date. Furthermore, it would be interesting to do some decompositions to determine whether labour reallocation across jobs is an important source of cyclical movements in the aggregate incidence and gap.
- When analyzing the implications of the $15 per hour minimum wage for the low-wage gap, we assumed that there were no labour supply or labour demand behavioural responses. In reality, labour supply and labour demand would respond to changes in the minimum wage. In future work, it would be worthwhile to expand the simulation to include these behavioural responses of labour supply and labour demand.
- There is a growing interest in the concept of a “living wage,” which policymakers can control more directly than the wage distribution. In light of this, it might be informative to analyze low-wage employment using an absolute low-wage threshold that reflects suggested acceptable “living wages” in Canada.Since there are year-over-year fluctuations in the low-wage threshold, some of the variability in the low-wage gap and the incidence of low wages could be smoothed over by using a moving-average low-wage cutoff. Finally, in future research it might be interesting to focus on movements between the end points, as opposed to focusing on changes between the initial and final observations. It might also be helpful to try and tie changes in the low-wage incidence and the low-wage gap to changes in labour policies, macroeconomic conditions, etc., especially at the provincial level.

IX. References

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