OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

An Assessment of Canada's Labour Market Performance

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The mandate of the Parliamentary Budget Officer (PBO) is to provide government's estimates and trends in the Canadian economy; and upon request from a committee or parliamentarian, to estimate the financial cost of any proposal for matters over which Parliament has jurisdiction.

Prepared by: Randall Bartlett and Stephen Tapp*

* The authors thank Mostafa Askari, Patricia Brown, Scott Cameron, Hai Yun Lao, May Luong, Chris Matier and Jocelyne Scrim for helpful comments. Please contact Randall.Bartlett@parl.gc.ca and Stephen.Tapp@parl.gc.ca for further information. Part of the analysis is based on Statistics Canada's *Labour Force Survey* public use microdata files. All computations, use and interpretation of these data are those of the authors who are also responsible for any errors.

Summary

Labour market performance, particularly jobs, is a recurrent focus for policymakers and analysts. Assessments of labour market performance, however, often focus narrowly on the short-term movements of a small set of indicators, such as the level of employment and the unemployment rate. While these indicators are useful, on their own they provide only a limited view of the labour market.

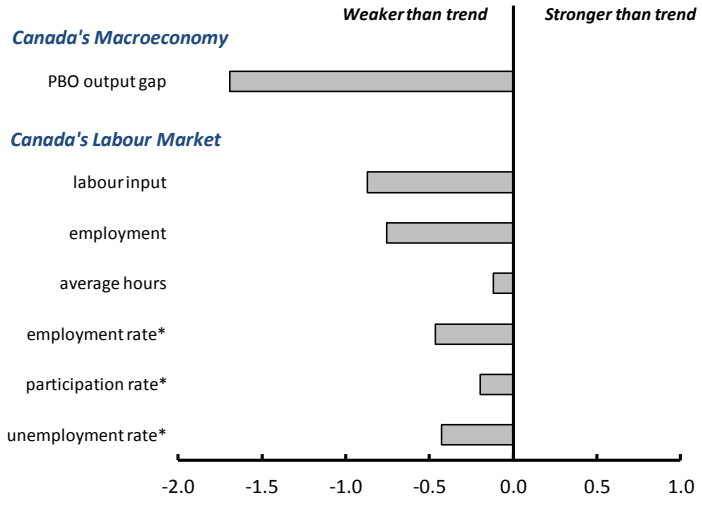
In this report, PBO attempts to provide a richer perspective on the performance of Canada's labour market by: analyzing a broad set of labour market indicators; comparing current levels to PBO's estimates of their underlying trends; exploiting longer time periods that include previous recessions; and comparing Canada's recent performance to a large group of advanced economies. To assess labour market performance, this report addresses the following three questions:

Question 1: How is Canada's labour market performing relative to underlying trends?

Despite the continued recovery in Canada's overall economy and labour market since the depths of the global recession in 2009, PBO finds that most labour market indicators remain weaker than their estimated trend levels (Summary Figure 1). For instance, PBO estimates that in the third quarter of 2012 aggregate employment in Canada was roughly 0.8 per cent, or more than 130,000 jobs, below its trend. In addition to being weaker than their respective trends, several labour indicators that are expressed as rates (e.g., the unemployment, employment, and participation rates) remain weaker than before the recession began. The current cyclical weakness in Canada's labour market at the macro level is consistent with subdued wage growth, the Bank of Canada's judgement that some slack remains in the labour market, and the fact that PBO and several other organizations — including the IMF, OECD, and the Bank of Canada — estimate that Canadian GDP is currently below its trend or potential level.

Summary Figure 1: Key Labour Market Indicators Relative to Trend, 2012Q3

per cent deviation from PBO trend estimates

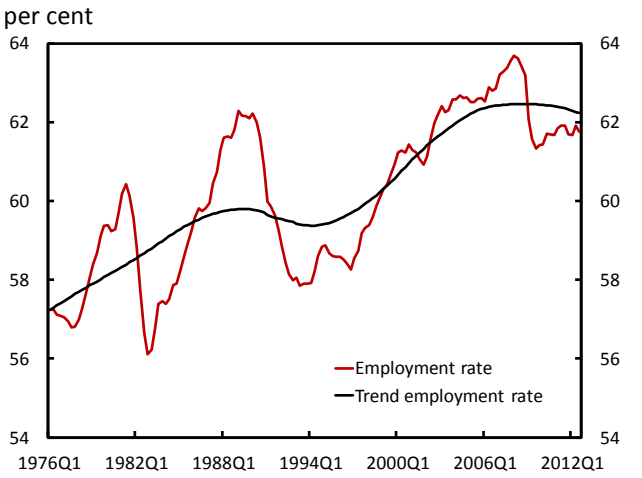


Source: Office of the Parliamentary Budget Officer.
Note: * Denotes percentage point deviation. See Sections 2 and 3 of the paper and Annex A for details.

Question 2: How is Canada's labour market performing relative to previous economic cycles?

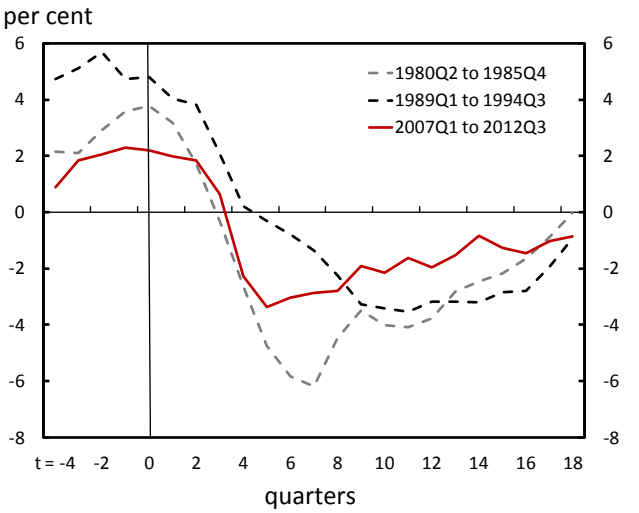
Canada's labour market entered the recent recession in a stronger position than in previous decades with a lower unemployment rate and a higher employment rate (the employment rate, or employment-to-population ratio, expresses employment as a share of the population 15 years of age and older, see Summary Figure 2a). This is related in part to favourable demographic changes and the continued increase in the labour market attachment of women.† Moreover, PBO finds that in the four years following the most recent global recession, Canada's labour market has generally fared better than in the downturns of the 1980s and 1990s (Summary Figure 2b). This was the case for most labour indicators analyzed, particularly unemployment-related measures, which were not as negatively impacted in the recent recession relative to previous economic cycles.

Summary Figure 2a: Employment Rate, 1976Q1 to 2012Q3



Source: Office of the Parliamentary Budget Officer.
Note: See Section 2 of the paper and Annex A for details.

Summary Figure 2b: Comparing Business Cycles, Detrended Total Hours Worked



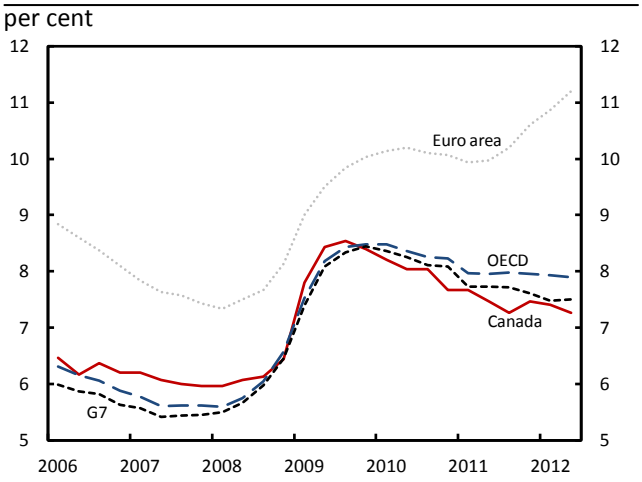
Source: Office of the Parliamentary Budget Officer.
Notes: Time t=0 corresponds to the employment gap peak.
See Section 2 of the paper and Annex A for details.

Question 3: How is Canada's labour market performing relative to other countries?

During the global recession, the rise in the unemployment rate was somewhat smaller in Canada than for the overall G7 and OECD countries (Summary Figure 3a on the next page). Among the G7 countries, the change in Canada's employment rate of the working-age population was in the middle (Summary Figure 3b). Despite broadly comparable recessionary labour market impacts, Canada is currently performing better than average among the G7 and OECD countries for several labour market indicators, particularly long-term unemployment and the female employment rate. Moreover, Canada's labour market is currently performing much better than in some countries with struggling economies such as the U.S. and Euro area.

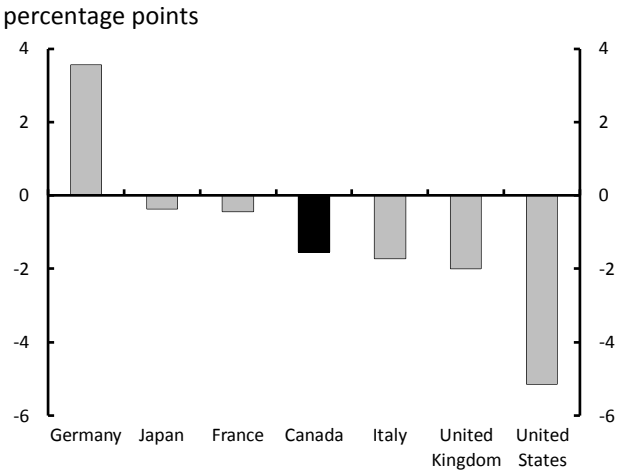
† In the future, as baby boomers retire demographic factors will slow labour force growth (see, e.g., PBO, 2012).

Summary Figure 3a: Harmonized Unemployment Rates, 2006Q1 to 2012Q2



Source: OECD Employment Database.
Note: The Euro area consists of the 17 European Union member states that use the euro. See Section 5 of the paper for details.

Summary Figure 3b: Changes in the Employment Rates of G7 Countries, 2007 to 2011



Source: Office of the Parliamentary Budget Officer; OECD Employment Database.
Note: Employment as a share of the population aged 15-64. See Section 5 of the paper for details.

Government Reporting on Labour Market Developments

PBO believes that government reporting on labour market developments could be improved if the Government of Canada reported similar indicators of labour market performance in their major economic documents — for example, by reporting key labour indicators relative to their trend estimates in both the *Budget* and the *Update of Economic and Fiscal Projections*. This approach would provide a more complete and informative assessment of Canadian labour market developments for the benefit of both parliamentarians and Canadians.

Contents

1. Introduction

Labour market performance, particularly jobs, is a recurrent focus for policymakers and analysts. Assessments of labour market performance, however, often focus narrowly on the short-term movements of a small set of indicators, such as the level of employment and the unemployment rate. While these indicators are useful, on their own they provide only a limited view of the labour market. For example, some commentators that monitor recent labour market developments give undue importance to monthly changes in these data, which — because they are estimated by surveying a subset of the Canadian population — are subject to sampling error.[1] Furthermore, some analysis that does take a longer-term perspective may still give an incomplete view of labour market performance if other relevant, contextual information is absent — such as underlying trends in the series or changes in the working age population over the same period.[2]

In this report, PBO attempts to provide a richer perspective on the performance of Canada's labour market. Our approach involves: analyzing a broad set of labour market indicators; comparing current levels to PBO's estimates of their underlying trends where feasible; exploiting longer time periods that include previous recessions; and comparing Canada's recent performance to a large group of advanced economies.

This analysis suggests that, in general, Canada's labour market was not as negatively affected in the current downturn, relative to previous episodes in the 1980s and 1990s. That said, a broad set of Canadian labour market indicators remain weaker than their underlying trends — and in some cases weaker than before the global recession in 2009. Relative to G7 and OECD countries, Canada is currently performing better than average for several comparable labour indicators and is doing much better than some other harder-hit economies such as the U.S. and Euro area.

Underlying Canada's macro-level labour data is a nuanced picture by age, industry, sex and region. Some recent noteworthy trends are that older workers have generally fared better than younger workers, services better than goods-producing sectors, women better than men, and the Prairie Provinces have exhibited tighter labour market conditions than the rest of the country.

The analysis in this report is primarily descriptive in nature. The goal of comparing key indicators to PBO estimates of longer-run trends is to provide additional context on recent developments. Explaining why underlying labour trends have changed over time, why the recent recession was relatively milder on the labour market than in the past, or why Canada's labour market is currently performing better than some other economies are all important and complex questions that are beyond the scope of this paper and are left for future research.

The rest of this report is organized as follows: Section 2 analyzes employment indicators; Section 3 examines unemployment indicators; Section 4 discusses wages and compensation; Section 5 compares Canada's labour market performance to other countries; and Section 6 concludes. The annexes provide additional information and technical details.

[1] For example, at a commonly used level of statistical significance – the five per cent level — monthly movements in the *Labour Force Survey (LFS)* employment series were only statistically different from zero in three of the last 24 months, or only 12.5 per cent of the time. In contrast, significant changes are much easier to detect when one considers movements over longer time horizons, as 37.5 per cent of the movements at a quarterly frequency were statistically significant over the same time period. This simple illustration suggests that it can be more informative to analyze labour market performance over longer time horizons.

[2] For instance, Budget 2012 stated that "over 1.1 million new jobs (had been) created since the beginning of 2006." (parentheses added) While correct, this does not take account of the change in the working age population (i.e., the number of Canadians age 15 years and over), which increased by 1.4 million people over this period (current estimate). As a result, the *employment rate* — a preferred labour market indicator that expresses employment as a share of the working age population — fell from 62.4 to 61.6 per cent over this period.

2. Employment Indicators[3]

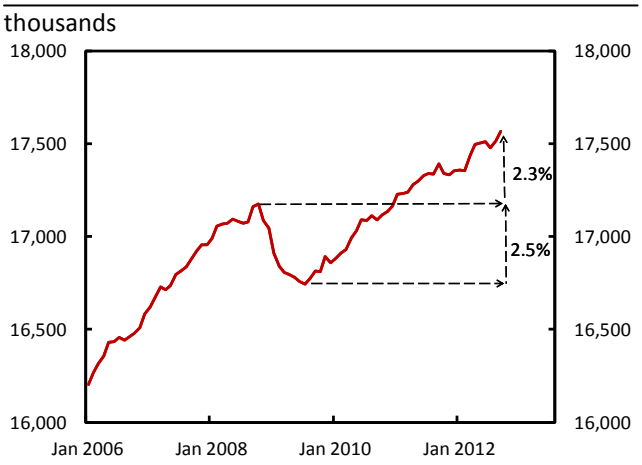
This section analyzes several key labour market indicators relative to their respective trends and past economic cycles, such as the level of employment, the employment and participation rates, as well as average and total hours worked.

Employment

After declining 2.5 per cent in the recent recession, employment in Canada is currently 2.3 per cent above its pre-recession peak from October 2008 (Figure 2-1).[4] The level of employment is now 4.9 per cent above its recessionary trough from July 2009, an increase of over 820,000 net new jobs.

Figure 2-1

Employment, January 2006 to September 2012

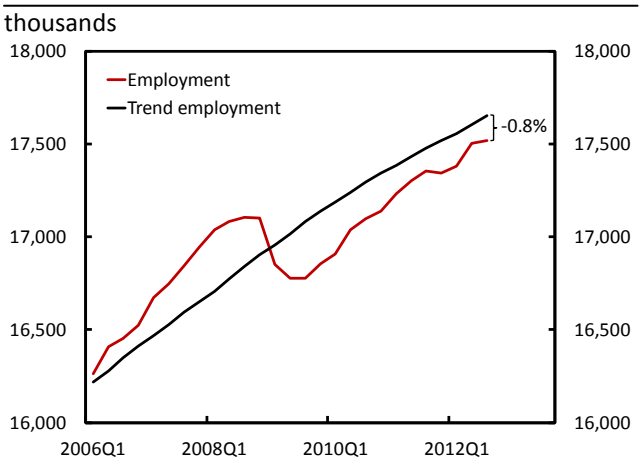


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Despite these gains, however, PBO estimates that employment was 0.8 per cent, or more than 130,000 jobs, below its trend level in the third quarter of 2012, suggesting that some slack remains in Canada's labour market (Figure 2-2).

Figure 2-2

Employment, 2006Q1 to 2012Q3

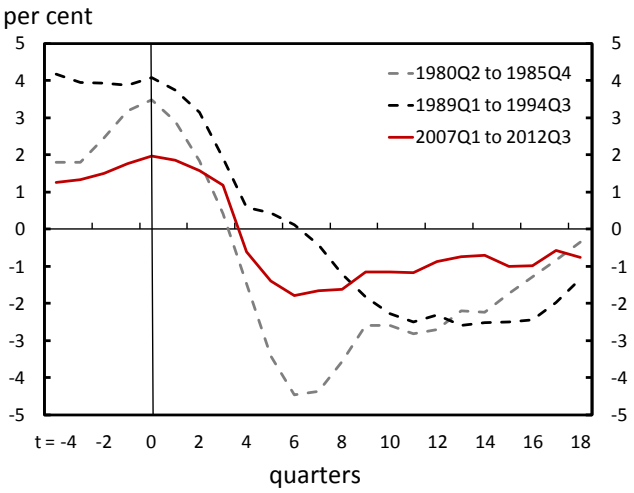


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

A historical comparison is also helpful to better understand the nature of employment during the recent recession and recovery relative to past business cycles. Looking at the employment gap — the difference between actual and trend employment as a per cent of trend employment — the deviation of employment from trend in the most recent recession was generally more muted than in previous episodes (Figure 2-3).

Figure 2-3

Employment Gap Comparison with Past Cycles



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

[3] Annex B presents disaggregated labour market results.
[4] Much of the following analysis begins in the first quarter of 2006 as this date corresponds to most labour market analysis in Budget 2012.

Employment Rate

While employment has surpassed its pre-recession level, the working age population (i.e., civilian, non-institutionalized individuals aged 15 years and over) has also continued to expand. As such, the employment rate — defined as employment as a per cent of the working age population — remained below its trend level by 0.5 percentage points (p.p.) and below its pre-recession peak by 1.9 p.p. in the third quarter of 2012 (Figure 2-4).

Figure 2-4

Employment Rate, 2006Q1 to 2012Q3

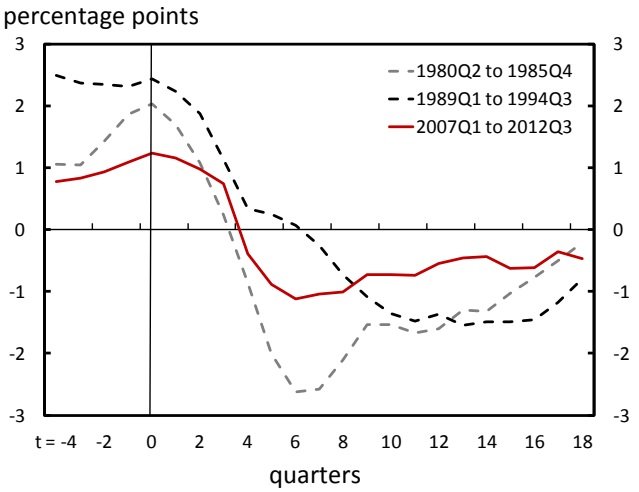
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Despite remaining below trend now, relative to past business cycles, the employment rate was closer to trend entering the recent recession and the employment rate gap was generally less negative than in past episodes (Figure 2-5).

Interestingly, because of the rise in the female employment rate in recent decades, the aggregate employment rate (actual and trend) was also at its historical peak entering the recent recession (Figure 2-6).

Figure 2-5

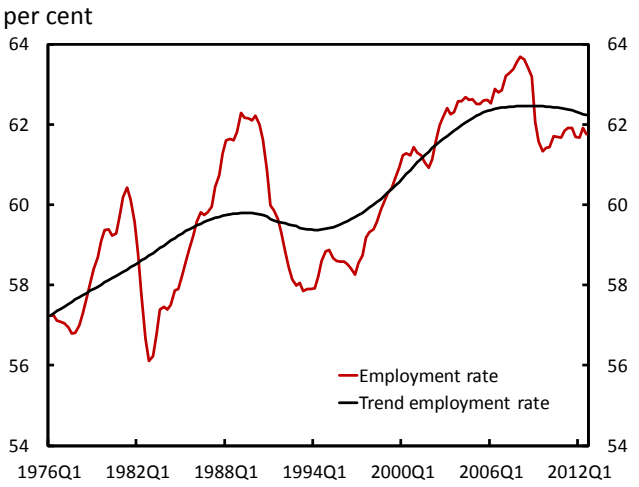
Employment Rate Gap Comparison with Past Cycles



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

Figure 2-6

Employment Rate, 1976Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

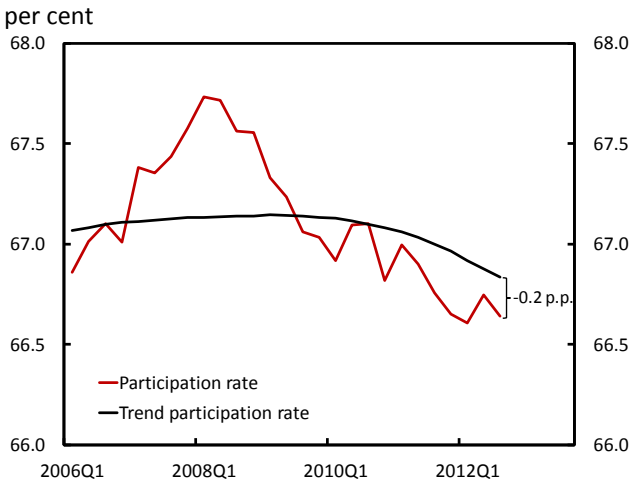
Participation Rate

Another key labour market indicator is the participation rate, which is defined as the labour force (i.e., Canadians who are employed or unemployed but looking for work) as a per cent of the working age population. A decline in the participation rate is typically viewed as a negative development because it indicates that fewer people are engaged in, or looking for, work.

Following a decline during the recent recession and subsequent recovery, the participation rate is currently quite close to its trend level, being below trend by only 0.2 p.p. in 2012Q3 (Figure 2-7). However, it remains 1.1 p.p. below its pre-recession peak of 67.7 per cent reached in 2008Q1.

Figure 2-7

Participation Rate, 2006Q1 to 2012Q3

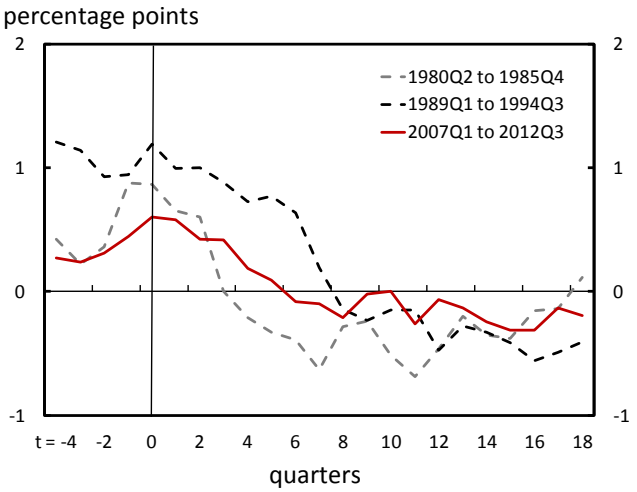


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

This said, the participation rate gap — the difference between the actual and trend participation rates — is broadly comparable to previous downturns (Figure 2-8).

Figure 2-8

Participation Rate Gap Comparison with Past Cycles

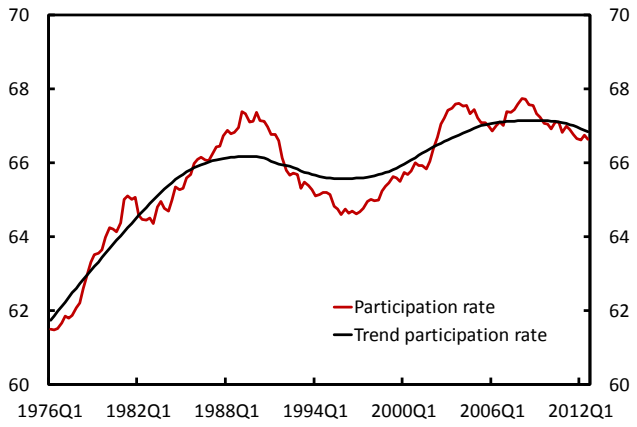


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

However, when examined in a historical context, the participation rate is above that observed in previous recessions and subsequent recoveries (Figure 2-9). Much like the employment rate, the participation rate has also increased over time in response to an increasing participation rate among women.

Figure 2-9

Participation Rate, 1976Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

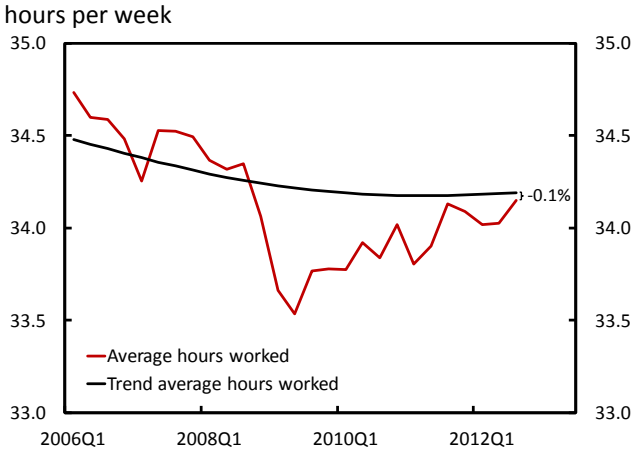
Average Weekly Hours Worked

In addition to employment, average weekly hours worked per employee is an important input used to determine total hours worked – a key driver of economic growth used to calculate potential GDP. While the size of the working age population and the aggregate employment rate determine the quantity of the workforce, average hours worked provides a measure of the intensity with which the workforce is used.

As was the case with most economic indicators, average weekly hours worked fell below trend during the recent recession but has subsequently moved back toward trend. Currently, average weekly hours worked are 0.1 per cent below trend (Figure 2-10).

Figure 2-10

Average Weekly Hours Worked, 2006Q1 to 2012Q3

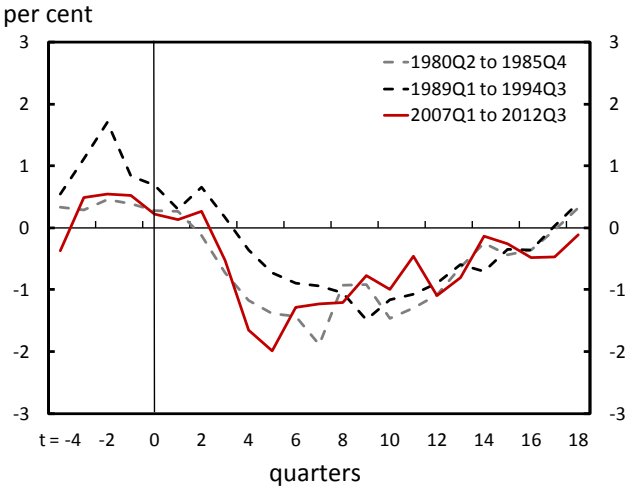


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Seasonally adjusted using the seasonal adjustment factors applied to total hours worked.

The change in the average weekly hours worked gap — actual less trend average weekly hours worked as a per cent of trend average weekly hours worked — displayed a pattern during the recent recession and recovery that was similar to that of past downturns (Figure 2-11).

Figure 2-11

Average Weekly Hours Worked Gap Comparison with Past Cycles

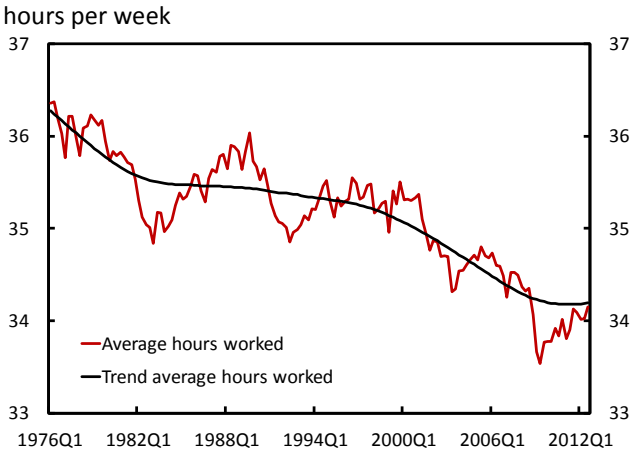


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

Interestingly, over the past few decades there was a marked reduction in average weekly hours worked (Figure 2-12). This phenomenon again reflects, in part, the increased presence of women in the labour market, but also a trend decline in the average hours worked of younger workers as a result of increased school enrolment rates (PBO, 2010).

Figure 2-12

Average Weekly Hours Worked, 1976Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Total Hours Worked

Several of the aforementioned labour market indicators are used to calculate total hours worked (also known as 'labour input'), a key component used to calculate potential GDP. Specifically, labour input can be expressed as:

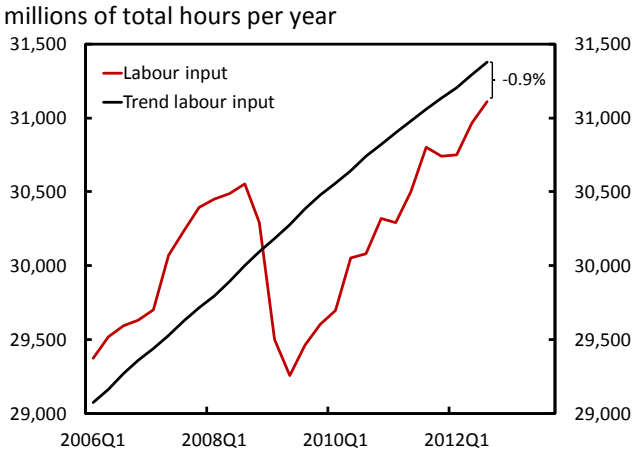
$$L = LFPOP \cdot LFER \cdot AHW \cdot 52$$

where: LFPOP is the working age population; LFER is the employment rate; and AHW is average weekly hours worked.

Labour input is currently 0.9 per cent below its estimated trend (Figure 2-13). This is a result of both the employment rate and average weekly hours worked being below their respective trends.

Figure 2-13

Labour Input, 2006Q1 to 2012Q2

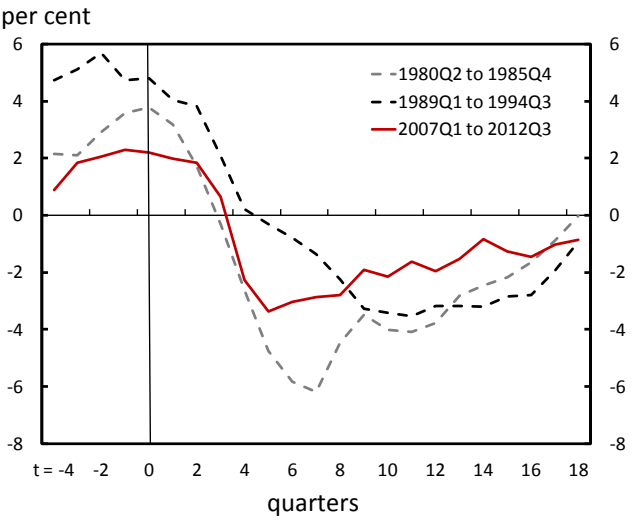


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

As such, the cycle-on-cycle pattern of the labour input gap — actual less trend labour input as a per cent of trend labour input — is broadly comparable to that observed for both the employment rate and average weekly hours worked, and exhibits a pattern during the cycles that is similar, but modestly better than that of past cycles (Figure 2-14).

Figure 2-14

Labour Input Gap Comparison with Past Cycles



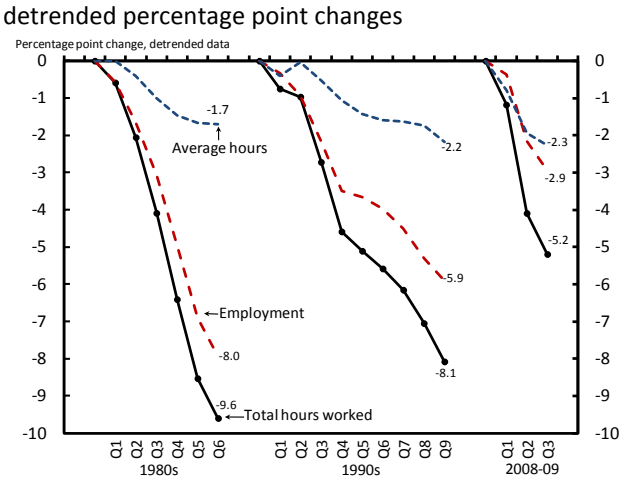
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

Given its construction, labour input can also be conveniently decomposed into two components: employment and average weekly hours worked. Compared with previous recessions, the fall in (detrended) total hours worked was much smaller in the recent recession — falling only 5.2 per cent compared to 8.1 and 9.6 per cent in the 1990s and 1980s recessions, respectively (Figure 2-15).[5] This decomposition suggests that the recent recession was different in the *relative contributions* of employment versus average hours. Typically in recessions, there is much more adjustment from employment than average hours. While average hours worked fell by a similar amount in this recession to that of previous recessions, employment fell by much less than in previous recessions.

[5] The Canadian recession dates of 1981Q3-1982Q4 and 1990Q2-1992Q2 are based on Cross (2001). To simplify the presentation, the brief recession identified in 1980Q1-1980Q2 is not included. The most recent recession is dated 2008Q4-2009Q2, based on quarterly output-employment dynamics.

Figure 2-15

Decomposing Labour Input Compared with Past Cycles



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

3. Unemployment and Job Vacancy Indicators

This section analyzes various indicators of unemployment and labour market slack including: the level and rate of unemployment; labour market tightness; skilled labour shortages; unemployment duration and long-term unemployment; underutilized labour; and underlying unemployment flows.

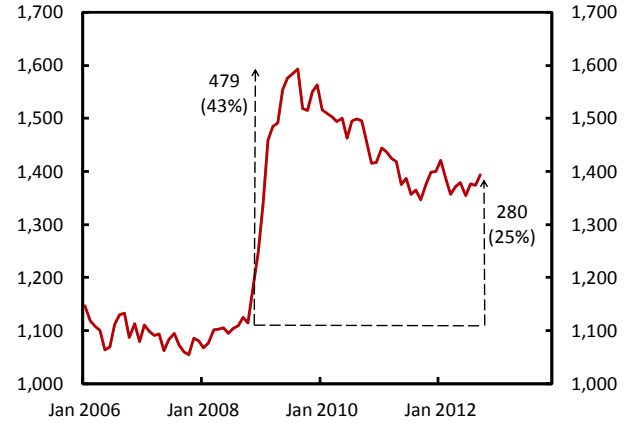
Unemployment

An individual is classified as unemployed if they are looking for work but unable to find a suitable job.[6] The level of unemployment rises dramatically in recessions. For instance, in the recent recession unemployment increased by almost 480,000 people to about 1.6 million — an increase of over 40 per cent (Figure 3-1). In September 2012, unemployment remained around 1.4 million, which is about 25 per cent above its pre-recession level.

[6] Strictly speaking, the unemployed were available for work during the reference week — the week with the 15th day of the month — but were not working in paid employment. The unemployed also includes those with a job but who were on temporary layoff and those who had a job to start within the next four weeks. This report does not analyze people who are not working and are not looking for work (non-participants in the labour force).

Figure 3-1

Unemployment, January 2006 to September 2012



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Elevated unemployment is a concern because of the burden imposed on the affected individuals and their families, which includes the possibility of large and persistent earnings losses and adverse health impacts. High unemployment also strains public finances due to increased unemployment benefits paid out and reduced tax revenue coming in. Moreover, the economy is less productive than it could be as less income is generated and output produced.

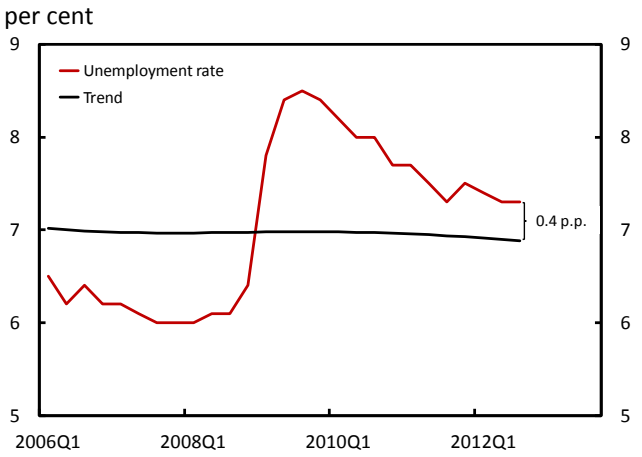
Unemployment Rate

The level of unemployment is one way to convey the number of people directly affected during a recession. However, because the labour force grows over time, the unemployment rate — which is the level of unemployment as a share of the labour force — is a more common indicator for macroeconomic analysis. The unemployment rate is also one measure of labour market slack, because it identifies people who are actively looking for work but cannot find suitable jobs.

In September 2012, Canada's unemployment rate was 7.4 per cent, down significantly from its recessionary peak of 8.7 per cent. Despite this improvement, the unemployment rate remained 0.4 p.p. above trend in 2012Q3 (Figure 3-2).

Figure 3-2

Unemployment Rate, 2006Q1 to 2012Q3

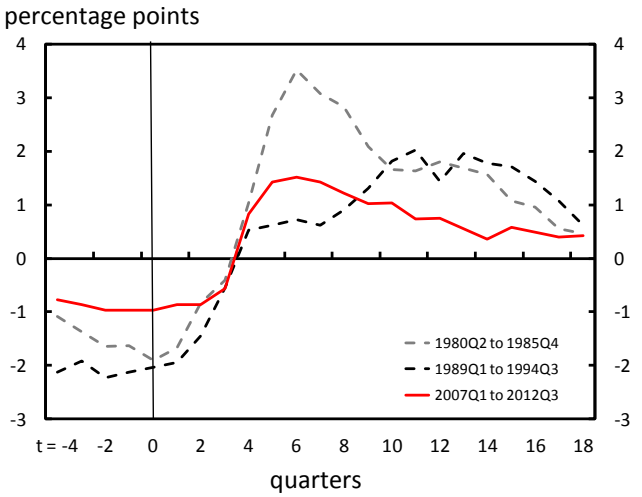


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Like some other labour indicators, the build-up in the unemployment rate gap — the difference between the actual and trend unemployment rate — was more modest during the recent recession and recovery than in past cycles (Figure 3-3).

Figure 3-3

Unemployment Rate Gap Comparison with Past Cycles



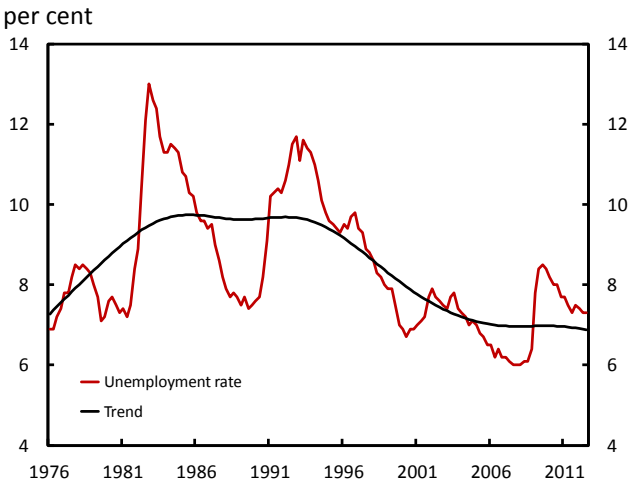
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

Indeed, four years after the global recession began in 2008 the unemployment rate is closer to trend than in previous episodes. In addition, the overall *level* of the unemployment rate is lower than in previous episodes, as trend unemployment has fallen over the past two decades, partly related to increased female attachment to the labour market as well as policy changes (Figure 3-4 and see, e.g., Barnett, 2007).

The unemployment rate can also be expressed as a function of other labour market indicators described above.[7] This expression shows that, in recessions, the unemployment rate often would have increased even more, but was partially restrained because people dropped out of the labour force due to the poor job prospects. This discouraged worker effect reduces the participation rate, which lowers the unemployment rate. This effect was strongest in the 1990s recession, where the unemployment rate would have peaked at 14.1 per cent instead of 11.7 per cent, if the participation rate remained unchanged at its pre-recession level.

Figure 3-4

Unemployment Rate, 1976Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Other Measures of Labour Market Conditions

While the unemployment rate is often used as a measure of labour market slack, other complementary indicators of labour market

[7] Specifically, $LFUR = 1 - \frac{LFER}{LFPR}$, where: LFER is the employment rate; and LFPR is the participation rate.

conditions are available. For example, Statistics Canada's *Job Vacancy Survey* asks businesses how many vacant positions they are looking to fill.[8] This survey helps assess labour demand. When the results are combined with unemployment statistics, they provide a measure of overall labour market conditions — so-called *labour market tightness*, which is calculated as the number of unemployed people per vacancy. A smaller number indicates tighter labour conditions with fewer unemployed per vacancy when workers tend to find new jobs more quickly, whereas a higher number indicates more slack in the labour market when workers typically take longer to find new jobs. Because the monthly survey began in January 2011, there is insufficient data for time series analysis. Nonetheless, the results by province revealed concentrated areas of labour market strength in 2011 (Figure 3-5). In particular, labour market conditions were tighter in the Prairie Provinces (Alberta, Saskatchewan and Manitoba) than in the rest of Canada. Conversely, there was more slack in labour markets in Atlantic Canada than in other regions of the country.

Figure 3-5

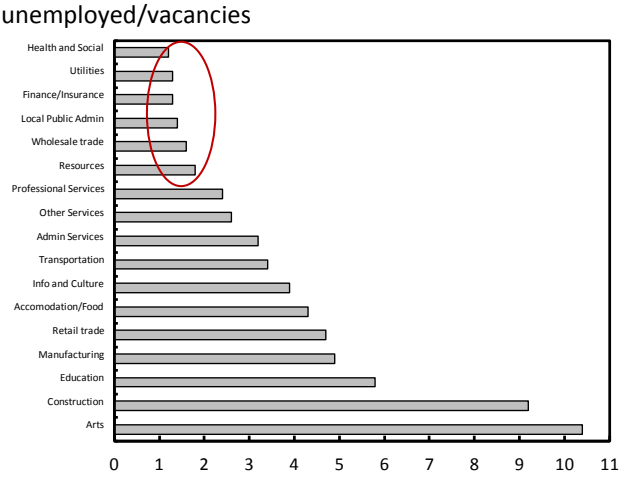
Labour Market Tightness by Province, 2011 Annual Average

Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Analyzing the results by industry suggests tight labour market conditions in several sectors, including: health and social; utilities; local public administration, finance and insurance; wholesale trade; and the resource sectors (Figure 3-6). In contrast, labour market conditions are especially slack in education, construction and the arts sectors. Overall, the labour market for service sector jobs is much tighter than in the goods-producing sectors.

Figure 3-6

Labour Market Tightness by Industry, 2011 Annual Average



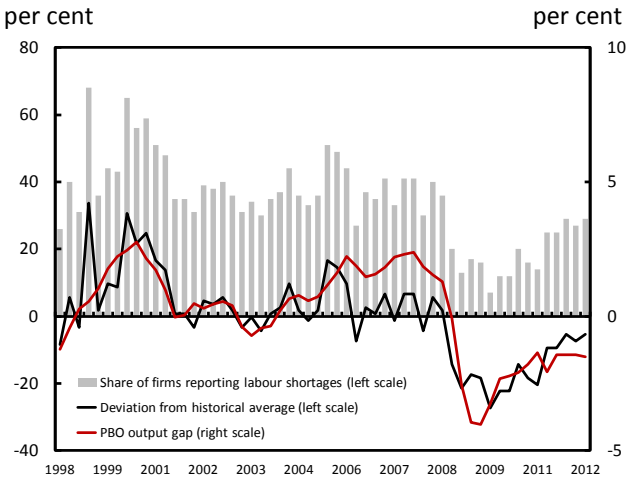
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Another useful indicator is the Bank of Canada's *Business Outlook Survey*, which reports labour shortages from the firm's perspective. These survey responses have historically tracked movements in PBO's output gap estimates fairly well, with a positive correlation of 0.8 (Figure 3-7). In the third quarter of 2012, the percentage of firms reporting labour shortages, at 33 per cent, was only slightly below its historic average of 34 per cent since the survey began in 1998. This result suggests somewhat less slack remaining in Canada's labour market than the other indicators.

[8] To be a job vacancy: the position exists; work could start within 30 days; and the employer is actively seeking workers from outside the firm. Vacancies include full-time; part-time; and temporary positions.

Figure 3-7

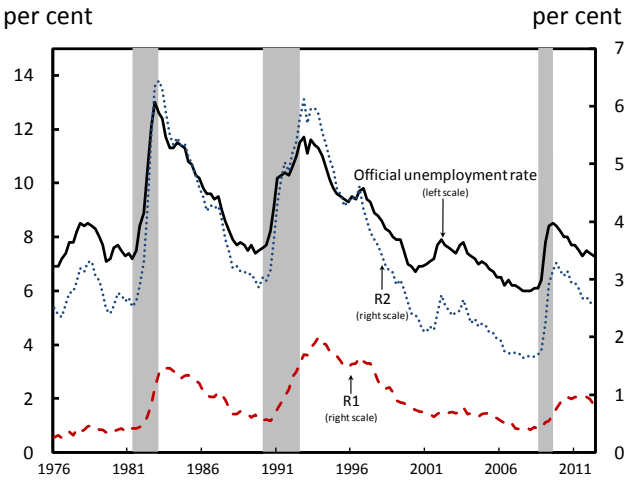
Firms' Perceptions of Skilled Labour Shortages and the Output Gap, 1998Q3 to 2012Q2



Sources: Office of the Parliamentary Budget Officer; Bank of Canada; Statistics Canada.

Figure 3-8

Statistics Canada's Long-Term Unemployment Rate Measures, 1976Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Notes: R1 is the unemployment rate for those unemployed 52 weeks or more; R2 the analogous rate for those unemployed 12 weeks or longer. PBO seasonally adjusted these series using Eview's Census X12 approach. Footnote 5 describes the dates of the recession shading.

Supplementary Unemployment Rate Measures

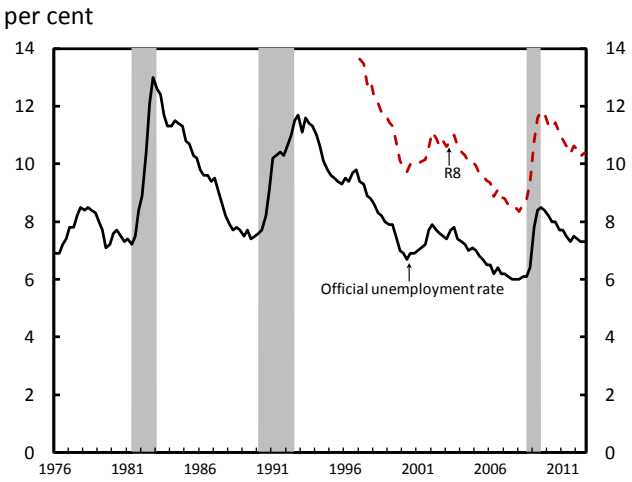
Statistics Canada also calculates supplementary unemployment rates which provide a broader perspective on Canada's unemployment situation. The 'R1' and 'R2' measures are the unemployment rates for those unemployed at least one year and at least three months, respectively. These indicators are used as measures of the economic hardship of long-term unemployment. Figure 3-8 shows what has been noted in related work by Gilmore and LaRochelle-Côté (2011), namely that "long-term unemployment in the recent downturn remained well below the levels experienced in earlier downturns."

The 'R8' measure is Statistics Canada's most comprehensive measure of underutilized labour (Figure 3-9). This indicator shows that there is more unused labour in the Canadian economy than is measured by the official unemployment rate.[9] The R8 measure has generally been about 3 p.p. higher than the official unemployment rate since the series began in 1997. This measure has tracked the official unemployment rate closely over the cycle, with surprisingly little change in the difference between these two series in the recent recession.

[9] Statistics Canada's R8 measure combines the unemployed and discouraged searchers, those waiting for recall or replies, long-term future starts, and a portion of involuntary part-time workers who report that they would prefer to work more hours — where the latter 'under-employed' group is the largest. Importantly, this more comprehensive measure does not capture under-employment where a worker's skills are not being fully used — i.e., workers who could supply more skill-intensive labour, given their existing hours worked.

Figure 3-9

Unemployment and Labour Underutilization Rates, 1976Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: PBO seasonally adjusted the R8 series using Eview's Census X12 approach. Footnote 5 describes the dates of the recession shading.

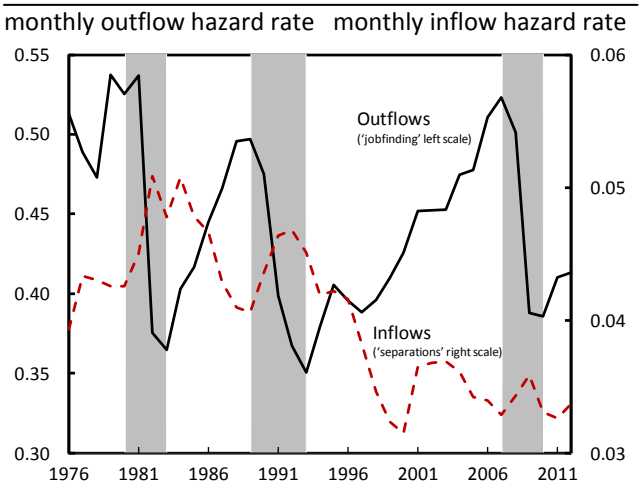
Unemployment Flows

The indicators described above are based on net as opposed to gross concepts and are *stock* rather than *flow* measures. In any given month, many workers are hired or quit their jobs, and join or leave the labour force. These movements are the gross flows of labour turnover and they are typically much larger than the net numbers used in most labour analysis.[10,11]

In particular, the flows into and out of unemployment — sometimes called the 'separation' and 'job-finding' rates, respectively — are useful indicators to better understand why unemployment is changing. As Figure 3-10 shows, unemployment increased in Canadian recessions because the inflow rate increased and also because the outflow rate fell as the unemployed took longer to find jobs. Stated differently, the incidence of unemployment increased because of elevated job loss, and in addition, unemployment spells lasted longer because there was less job finding. Preliminary results for 2012 suggest that the outflow/job finding rate remains below its historic average, while the inflow/separations rate — which spiked temporarily in the recession — remains near historic lows.[12]

Figure 3-10

Estimated Unemployment Flows, 1976 to 2012



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: The final month of data is September 2012. See Annex C for methodological details. Footnote 5 describes the dates of the recession shading.

Unemployment inflows/job separations can be further disaggregated into job losses due to layoffs versus quits. This approach effectively distinguishes firm-initiated *job losers* from worker-initiated *job leavers.* Not surprisingly, the two series exhibit very different cyclical properties, with layoffs rising during recessions and quits falling (Figure 3-11). Layoffs rise during recessions as businesses facing weak demand try to contain costs by reducing

[10] For example, when the LFS reports (net) employment growth of, say, 30,000 jobs, the actual number of new jobs is much larger because the net job creation number subtracts all employment losses from all employment gains.

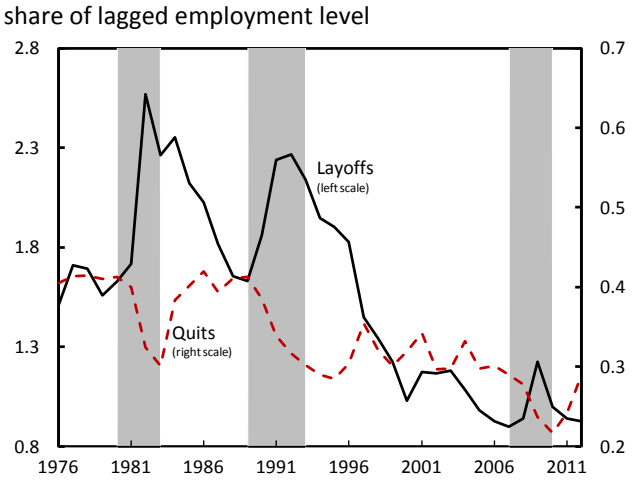
[11] Techniques to analyze unemployment flows were developed by recent research that provides a relatively simple approach that uses time series data developed from repeated analysis of cross-sectional labour market surveys. See Annex C for details.

[12] The relative contributions of unemployment inflows versus outflows matter for the design of labour market policies. For example, if elevated inflows/job separations are the relatively more important factor of the two forces during recessions, then policy might focus on employment insurance benefits. Alternatively, if weak outflows/job-findings are more important — as suggested by recent research (Campoleti, 2011) — then policy might emphasize re-training, labour mobility across regions or industries, or policies that could encourage the unemployed to accept lower wage offers, such as wage insurance.

employment. Conversely, quits fall — particularly at the end of recessions — and remain depressed through the start of recoveries because workers stay in their existing jobs longer when labour market conditions are weak and new jobs are harder to find.

Figure 3-11

Disaggregated Unemployment Inflows, 1976 to 2012



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: The final month of data is September 2012. No correction is made for time-aggregation bias. Footnote 5 describes the dates of the recession shading.

Unemployment Duration

The unemployment rate measures unemployment incidence — i.e., how many people are unemployed as a share of the labour force. Unemployment duration data, on the other hand, describe how long unemployment spells last.

Long-term unemployment is problematic because the long-term unemployed have a lower likelihood of finding a job the longer they are out of work, and their skills depreciate more and they may ultimately become discouraged and drop out of the labour force. For these reasons, when higher shares of the unemployed suffer long-term unemployment — as is currently being experienced in the U.S., and which occurred in Europe in 1980s — there are concerns of *hysteresis,*[13] which occurs when a recession permanently increases the economy's longer-run structural unemployment rate and/or lowers its potential output growth.

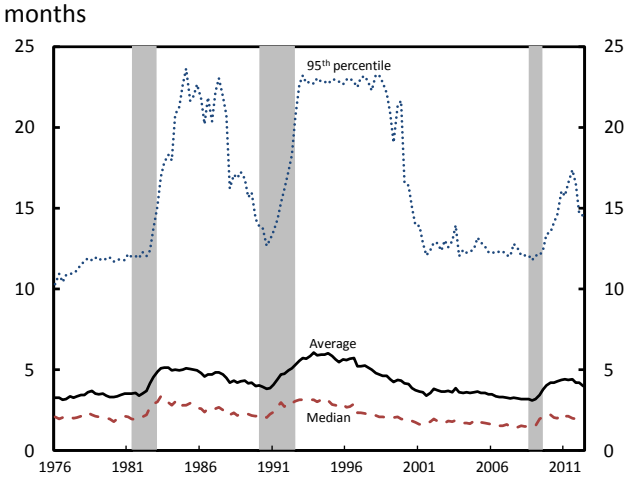
Figure 3-12 reports the results of distributional analysis of unemployment duration spells using LFS microdata for the average, median, and 95th percentile of the distribution. The 95th percentile illustrates the concern of long-term unemployed (the dashed blue line in the figure shows the minimum duration for the 5 per cent of the unemployed that have the longest on-going unemployment spells). There is a clear skew in the unemployment distribution due to this smaller group of the very long-term unemployed who inflate the average duration. The figure also shows that this duration series lags the economic cycle.[14] This occurs because of the initial spike of layoffs in recessions. As some of these people fail to subsequently find work in the weak labour market, their numbers take time to show up in the long-term duration measures.

Based on the length of unemployment spells, the recent recession was not as severe as the two previous recessions in Canada. For instance, median unemployment duration was almost 50 per cent higher in the mid-1990s than it was after the most recent recession.

[13] See DeLong and Summers (2012) for a recent discussion of hysteresis.
[14] These data use on-going, incomplete unemployment spells of the currently unemployed. Some research suggests that using completed unemployment spells may provide a better cyclical indicator of the labour market (Corak and Heisz, 1995).

Figure 3-12

Unemployment Duration, Distributional Analysis, 1976Q1 to 2012Q3



Source: PBO calculations using Statistics Canada's Labour Force Survey public use microdata files.
Note: Footnote 5 describes dates of the recession shading.

4. Wages and Compensation

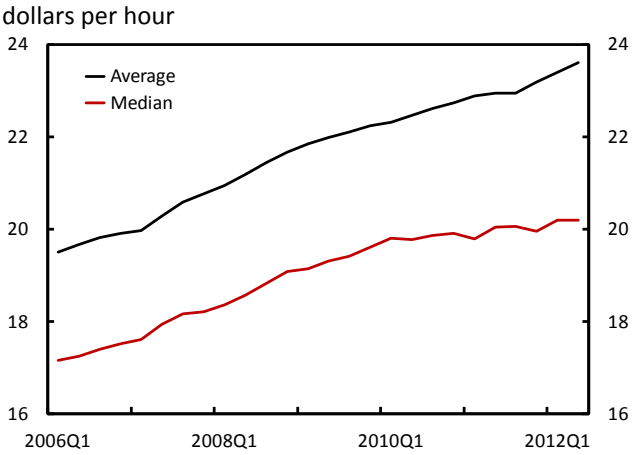
Another important consideration in assessing the performance of the Canadian labour market is the evolution of wages and compensation.[15]

In nominal terms (i.e., not adjusting for inflation), average and median hourly wages generally increased throughout the recent recession and recovery (Figure 4-1). This is to be expected, as nominal wages are typically rigid with respect to downward adjustments.

However, after adjusting nominal wages for total Consumer Price Index (CPI) inflation, average *real* wages stagnated and median real wages declined through the recovery, following solid growth prior to the recent recession (Figure 4-2). This result suggests the purchasing power of workers has remained generally unchanged, on average, since the end of 2010. Further, the gap between the average and median real hourly wages was the largest in 2012Q3 observed since the series began in 1997, implying that growth in real wages in the recovery is being disproportionately realized in the upper half of the wage distribution.

Figure 4-1

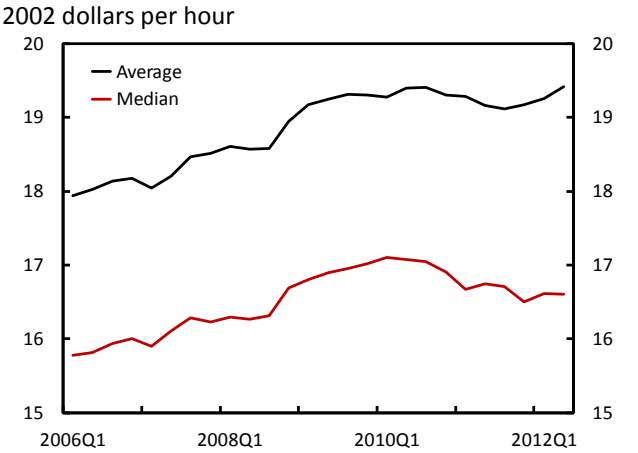
Nominal Hourly Wages, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: PBO seasonally adjusted these series using Eview's Census X12 approach.

Figure 4-2

Real Hourly Wages, 2006Q1 to 2012Q3



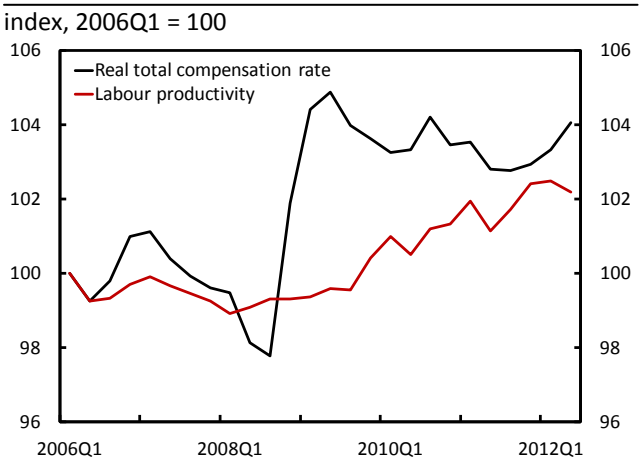
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Wage data is taken from the LFS and seasonally adjusted using the Census X12 approach.

[15] Please note that PBO does not estimate trend levels of wage and compensation indicators.

Further, in examining the real total compensation rate[16] and labour productivity[17] (both important indicators in determining labour's share of GDP), it can be observed that, while the real total compensation rate has been stagnant through the recovery, broadly in line with the average real wage rate, labour productivity has experienced a modest rebound through the recovery following a steady decline prior to the recession (Figure 4-3). As a result of the stagnant real total compensation rate and a modest increase in labour productivity through the recovery, total compensation as a share of output has declined.

Figure 4-3

Real Total Compensation Rate and Labour Productivity, 2006Q1 to 2012Q2

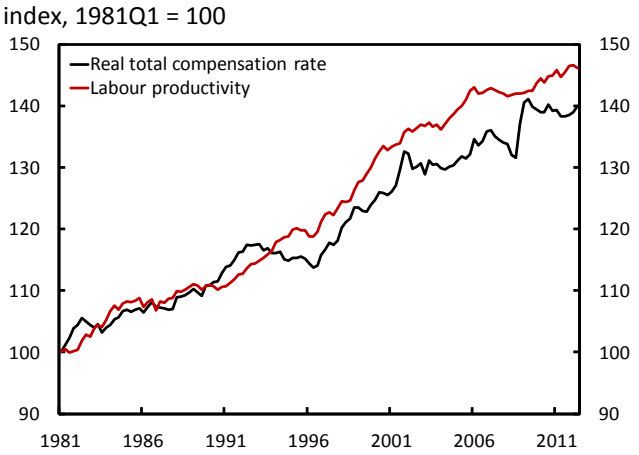


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Examining these series over a longer time horizon reveals that labour productivity growth has outpaced the growth in the real total compensation rate, on average, over the past three decades (Figure 4-4). This is particularly true since the mid-1990s, suggesting that productivity gains over this time have not led to equivalent increases in compensation.

Figure 4-4

Real Total Compensation Rate and Labour Productivity, 1981Q1 to 2012Q2



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

As a result of weaker growth in compensation relative to productivity, the labour share of GDP — the total of wages, salaries, supplementary labour income (SLI) and unincorporated business income as a share of GDP – have seen a general decline since the mid-1970s (Figure 4-5).[18] This phenomenon is observed in several advanced economies and, as the OECD stresses in a recent report "the decline of the labour share went hand-in-hand with greater inequality in the distribution of market income, which might endanger social cohesion and slow down the current recovery." (OECD, 2012).

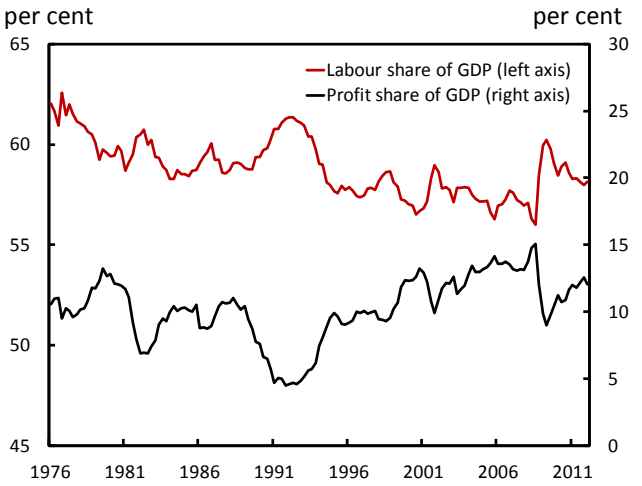
[16] According to Statistics Canada, the total compensation for all jobs consists of all payments in cash or in kind made by domestic producers to workers for services rendered. It includes the salaries and supplementary labour income of paid workers, plus an imputed labour income for self-employed workers. The total compensation rate refers to total compensation per hour worked, while the real total compensation rate refers to the total compensation rate deflated by GDP inflation.

[17] Labour productivity is defined as real output per hour worked.

[18] The sum of wages, salaries and SLI does not equal total compensation due to imputed labour income for self-employed workers, which is included in total compensation only.

Figure 4-5

Labour and Profit Shares, 1976Q1 to 2012Q2



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

5. International Comparisons

This section provides an international comparison of Canada's labour market performance in order to highlight some general trends and key differences across countries. As some caveats to the results: labour market policies — which impact labour market performances by affecting peoples' incentives to work and businesses' incentives to hire — differ across countries; as do the sizes of the economic shocks in the recent recession; and broader demographic trends. While these issues are important, they are beyond the scope of analysis in this section.

Canada-U.S. Comparisons

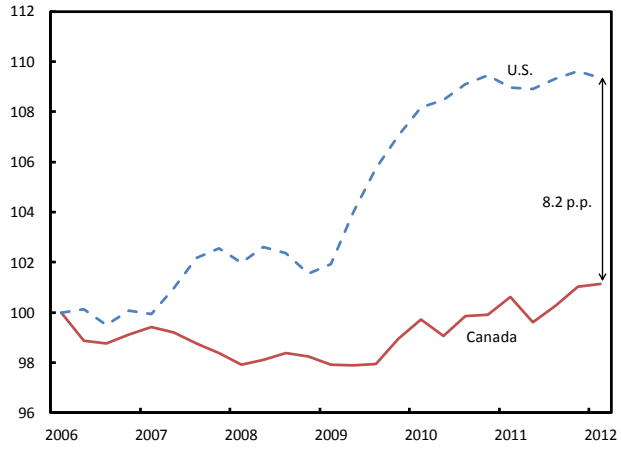
The United States is Canada's most common international comparator. Canada's labour market has performed significantly better than the U.S. since the recent recession began in 2008 (Figure 5-1 on the next page). Prior to the recession the U.S. had: a higher employment rate; lower unemployment rate; similar average unemployment duration; and a lower rate of underutilized labour than in Canada. However, as of the third quarter of 2012, the U.S. employment and participation rates were 3 p.p. lower; the U.S. unemployment rate was almost 2 p.p. higher; average unemployment duration was more than 20 weeks longer; and the underutilization rate of labour was over 4 p.p. higher than in Canada.

While Canada's labour market has undoubtedly performed better than in the U.S. recently, this partly reflects the fact that the U.S. labour market has done so poorly and is only now beginning to recover from its worst downturn of the post-World War II period (Elsby et al., 2010). For example, both the detrended employment and participation rates in the U.S. are at post-WWII lows, as is the unemployment outflow/job-finding rate.

Across most labour market indicators Canada is out-performing the U.S., with the exception of one important measure: labour productivity. Thus, the one potential silver lining in this comparison for the U.S. is that American productivity growth has been stronger than in Canada. Indeed, since 2006, U.S. real GDP per hour worked has been a cumulative 8 p.p. higher than in Canada (Figure 5-2).[19]

Figure 5-2

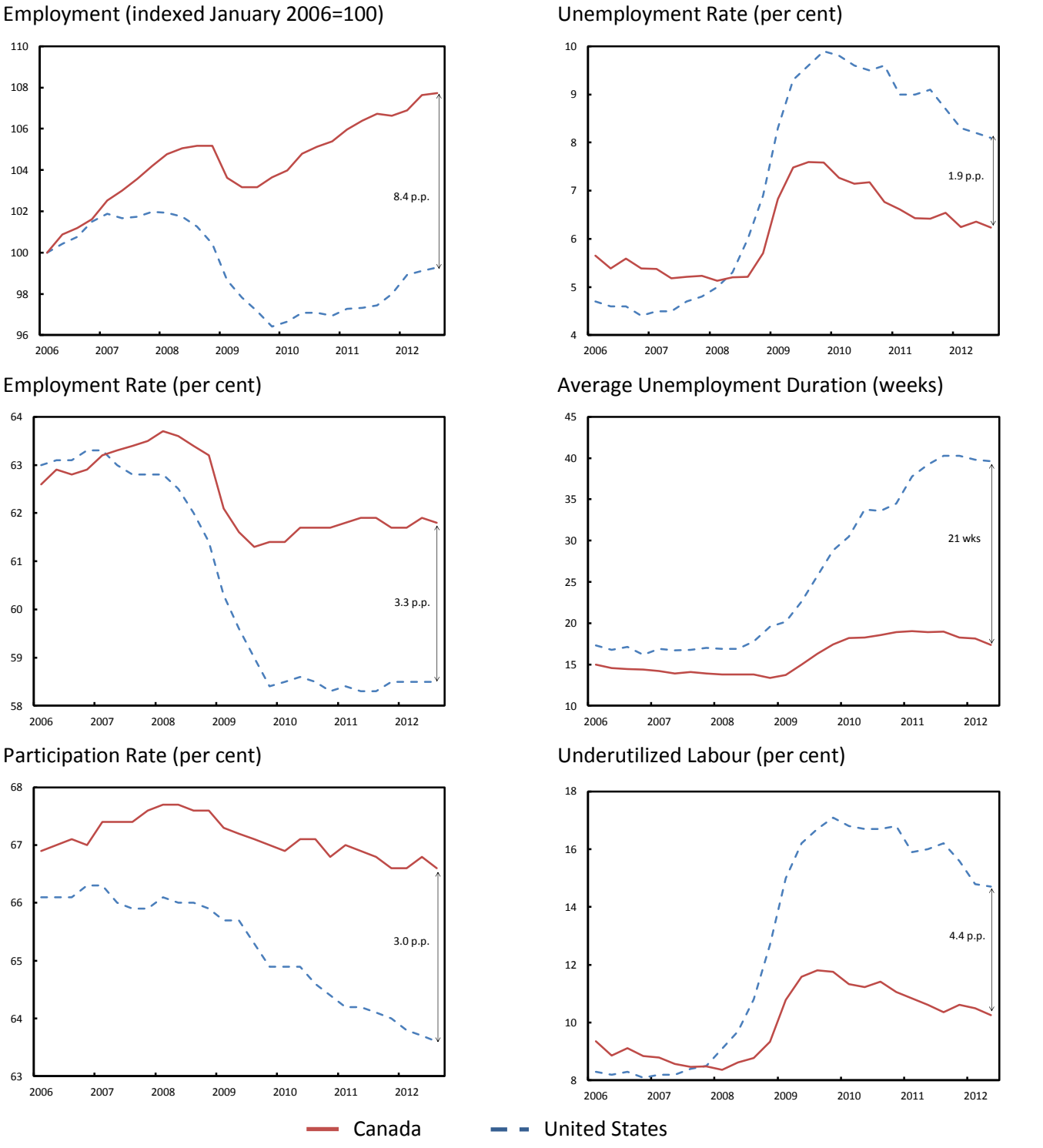
Canada and U.S. Labour Productivity in the Business Sector, 2006Q1 to 2012Q1



Source: Centre for the Study of Living Standards, *Aggregate Income and Productivity Trends: Canada vs. United States,* Table 6B.
Note: Labour productivity here is real output per hour worked.

[19] Of course these differences in labour market performance are also related to the overall macroeconomic performance — and Canada's economy grew faster over this period than in the U.S.

Figure 5-1: Canada and U.S. Labour Market Indicators, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada; U.S. Bureau of Labor Statistics.
Note: The Canadian unemployment rate is Statistics Canada's R3 measure which adjusts Canada's rate to match the U.S. definitions. The underutilized labour series are Statistics Canada's R8 measure for Canada and the Bureau of Labor Statistics' U6 measure for the U.S., which includes: the unemployed; those marginally attached to the labour force (including discouraged searchers); and people working part-time but would prefer full-time hours. PBO seasonally adjusted the Canadian R3, R8 and average duration series using Eviews' Census X12 procedure.

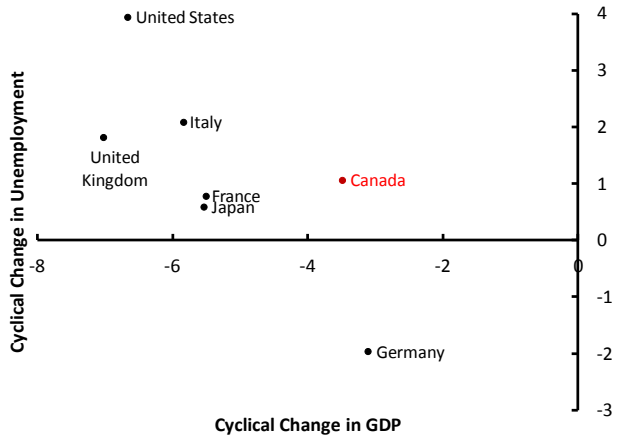
G7 Comparisons[20]

Indeed, broadening the analysis to the G7 countries reveals the extent of the recent cyclical labour market weakness in the U.S. Over 2007 to 2011, the American unemployment rate increased by 4 p.p. relative to the OECD's estimate of its structural rate (Figure 5-3) — a significantly larger increase than any other G7 countries. At the other extreme, the detrended unemployment rate actually fell in Germany over this period. While Canada's GDP shock was smaller than most G7 countries (except Germany), the cyclical labour market impacts in Canada were about average in the group and were similar to those experienced in France and Japan, who had relatively larger negative GDP shocks.

Figure 5-3

Cyclical Changes in Unemployment and GDP in G7 Countries, 2007 to 2011

percentage points



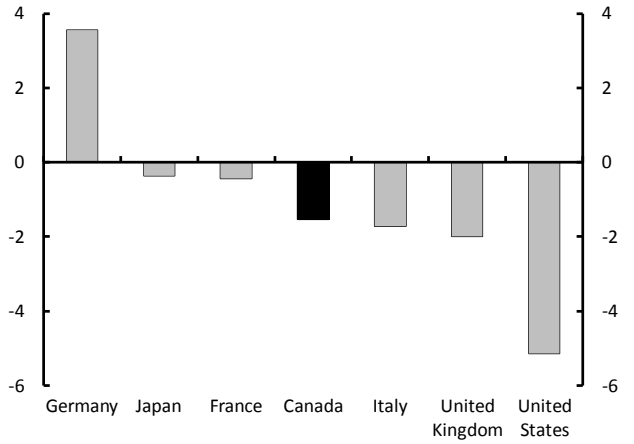
Sources: PBO calculations from OECD Economic Outlook 91 Database (May 2012).
Note: The cyclical change in unemployment on the vertical axis is the change in the country's commonly-used (rather than harmonized) unemployment rate relative to the OECD's estimate of its structural unemployment rate. The cyclical change in GDP on the horizontal axis is the change in the OECD's output gap estimate. Cyclical changes are calculated over 2007 to 2011 using annual data.

The employment rate — the number of employed as a share of the working-age population[21] — is generally considered a better indicator of labour market performance than the unemployment rate, because it does not depend on whether someone is considered to be in the labour force. Analyzing changes in this measure since the global recession began also suggests that Canada is near the middle among the G7 countries (Figure 5-4).[22]

Figure 5-4

Employment Rate Changes in G7 Countries, 2007 to 2011

percentage points



Sources: PBO calculations from OECD Economic Outlook 91 Database (May 2012).
Note: The employment rate is employment as a share of the population aged 15-64.

Table 5-1 ranks Canada's performance in 2011 relative to the other G7 countries for several comparable labour market indicators. Canada performs well in this comparison — its average ranking across these measures is 2.6 out of the sample of 7. Canada also led the G7 for two of the eight labour market indicators considered (i.e., long-term unemployment and the female employment rate).

[20] For broader cross-country comparisons, it is important to ensure that data definitions are reasonably consistent. Therefore, the calculations in these sections use the OECD's Employment Database.

[21] The OECD employment rates uses the working-age population aged 15-64, rather than the 15 years and older used in Canada's LFS.

[22] Budget 2012 demonstrates that Canada's employment growth between 2006 and 2011 led the G7. Here we use employment rates rather than employment levels because this normalization takes better account of the differences in the growth rates of the working age populations across the G7 countries.

Table 5-1

Comparing Canada to G7 Countries for Various Labour Market Indicators, 2011

	Canada	Canada's rank in the G7
Unemployment Rate (per cent)		
Total	7.5	3
Youth	14.1	3
Long-term	13.5	1
Employment Rate (per cent)		
Total	72.0	2
Older	58.7	4
Women	68.9	1
Total Annual Hours Worked	1,702	4
Average Annual Wages (US$)	42,253	3

Source: PBO calculations using the OECD's Employment Database.
Note: Youth is defined as aged 15-24; older workers aged 55-64. Long-term unemployment is defined as unemployment spells of at least 12 months as a share of total unemployment. Wages are based on the OECD's purchasing power parity estimates.

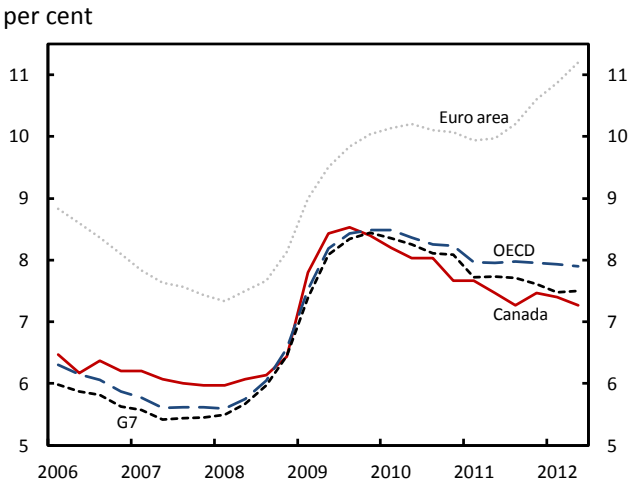
Broader OECD Comparisons

The OECD's harmonized unemployment rates are useful to facilitate better cross-country comparisons than the standard unemployment rates, which may use differing definitions across countries. Since 2008, Canada's harmonized unemployment rate has increased by slightly less than the G7 and OECD totals. At the end of the sample period in 2012Q2, Canada's unemployment rate was marginally below the overall G7 and broader OECD, and was well below the Euro area, which recently began to increase further (Figure 5-5).

Figure 5-6 examines recent cyclical shocks to output and labour markets in OECD countries relative to their structural levels. The results suggest that Canada has fared slightly better than the OECD as a whole — although this group includes some European economies that were among the hardest hit by the global recession (in the upper-left hand part of Figure 5-6).

Figure 5-5

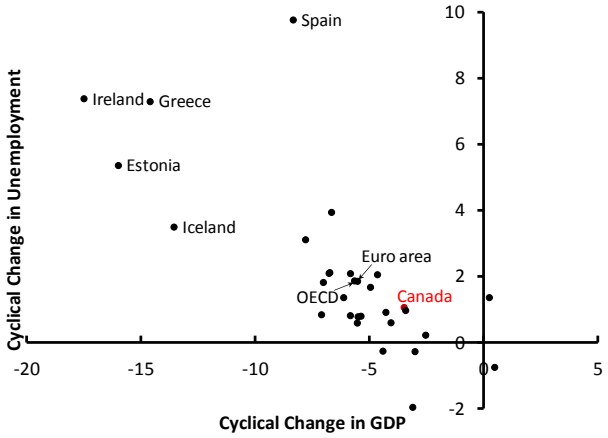
Harmonized Unemployment Rates, 2006Q1 to 2012Q2



Source: OECD Employment Database.
Note: The Euro area consists of the 17 EU member states that use the euro.

Figure 5-6

Cyclical Changes in Unemployment and GDP, OECD Countries, 2007 to 2011



Sources: PBO calculations from OECD Economic Outlook 91 Database (May 2012).
Note: The cyclical change in unemployment on the vertical axis is the change in the country's commonly-used (rather than harmonized) definition of the unemployment rate relative to the OECD's estimate of its structural unemployment rate. The cyclical change in GDP on the horizontal axis is the change in the OECD's output gap estimate. Cyclical changes are calculated over 2007 to 2011 using annual data.

Finally, Table 5-2 ranks Canada's performance in 2011 against all OECD countries for several comparable labour market indicators. For all of the measures considered except hours worked, Canada is performing better than the overall OECD average (scoring above the 50th percentile) given that Canada's various unemployment rates are lower and various employment rates are higher. When averaged across these eight indicators, Canada scores in the 66th percentile among the OECD countries. As noted above, the situation for long-term unemployment is much better in Canada than the overall OECD, as is the case for the female employment rate.

Table 5-2

Comparing Canada to OECD Countries for Various Labour Market Indicators, 2011

	Canada	OECD	Canada's percentile
Unemployment Rate (per cent)			
Total	7.5	8.2	53
Youth	14.1	16.2	69
Long-term	13.5	33.6	87
Unemployment Duration (weeks)	4.9	9.9	n.a.
Employment Rate (per cent)			
Total	72.0	64.8	70
Older	58.7	54.4	61
Women	68.9	56.7	82
Total Annual Hours Worked	1,702	1,776	48
Average Annual Wages (US$)	42,253	44,757	61
Average percentile ranking across OECD countries			**66**

Sources: PBO calculations using the OECD's Employment Database.
Note: Youth is defined as aged 15-24; older workers aged 55-64. Long-term unemployment is defined as unemployment spells of at least 12 months as a share of total unemployment. Wages are based on the OECD's purchasing power parity estimates. The sample consists of all 34 OECD countries for the unemployment and employment rates, but for hours worked consists of 32 countries; for wages consists of 29 countries; and for unemployment duration consists of only 11 countries, so this percentile ranking is not reported.

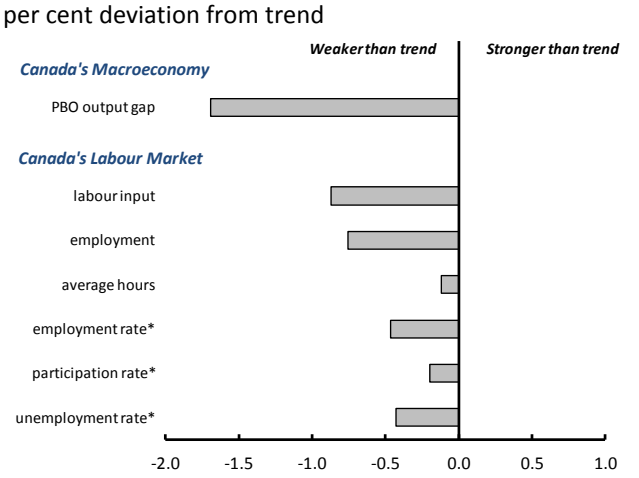
6. Conclusions

The primary goal of this paper is to present a broader perspective on the recent performance of Canada's labour market by examining labour market indicators relative to underlying trends, previous business cycles, and other countries.

Overall, most of the key labour market indicators at a national level in Canada have improved significantly from their recessionary lows, but they remain below PBO's estimates of underlying trend values (Figure 6-1). However, given PBO's estimate that the Canadian economy is currently around 1.7 per cent below its potential, this result should not be surprising.

Figure 6-1

Key Labour Market Indicators Relative to Trend, 2012Q3



Source: Office of the Parliamentary Budget Officer.
Notes: * Denotes percentage point deviation. See Sections 2 and 3 of the paper and Annex A for more details.

Our analysis also suggests that the recession of 2008-09 was comparatively milder relative to other downturns in Canada during the 1980s and 1990s, as reflected in many indicators, particularly unemployment measures.

Looking internationally, Canada's labour market is currently significantly outperforming some countries with struggling economies (e.g., the U.S.,

and Euro area) and Canada also scores above average among the G7 and OECD countries.

Underlying the aggregate data, Annex B of the paper reveals a nuanced picture by gender, age, region and industry. Some of these key recent labour market trends are that older workers have generally fared better than younger workers, services better than goods-producing sectors, women better than men, and the Prairie Provinces have exhibited tighter labour market conditions than the rest of the country.

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Annex A
PBO Methodology to Estimate Labour Market Trends and Potential GDP

This annex provides a brief summary of PBO's methodology to estimate trends for key labour market indicators. For more details, see PBO (2010).

As described by the identity below, labour input (total hours worked) is determined by the size of the working age population (LFPOP), the aggregate employment rate (LFER) and the average weekly hours worked (AHW):

$$L = LFPOP \cdot LFER \cdot AHW \cdot 52$$

To construct trend labour input, PBO estimates the respective trends of each of these components.

Working Age Population

The first component of labour input is the working age population, which comprises individuals 15 years of age and over. These data, which are provided by Statistics Canada, are disaggregated by age and sex over history.

Employment Rate

The second component of labour input is the employment rate, which is defined as the share of the labour force population that is employed. PBO estimates the trend employment rate using a model augmented filtering approach. To construct the trend employment rate, PBO applies a Hodrick-Prescott (HP) filter to individual employment rates by age and sex over the entire historical and projection period (in order to address the end-of-sample problem). The aggregate trend employment rate is then calculated by weighting the individual employment rates by their population shares.

Average Weekly Hours Worked

The third component of labour input is average weekly hours worked, whose trend is also estimated using a model augmented filtering approach. These historical data are augmented using the projected average weekly hours worked series by individual age and sex and then the augmented series are filtered using an HP filter.

Trend Unemployment Rate

While PBO does not estimate the trend unemployment rate directly, an estimate can be determined residually. Specifically, PBO applies its methodology to the labour force participation rate using the same specification as is used to estimate the trend employment rate, described above. The trend unemployment rate can then be calculated using the following equation:

$$LFUR = 1 - \frac{LFER}{LFPR}$$

where LFUR is the unemployment rate; LFER is the employment rate; and LFPR is the participation rate.

Trend Labour Productivity

The final component required to estimate potential GDP is trend labour productivity. PBO estimates trend labour productivity using the model augmented filtering methodology. PBO estimates and projects labour productivity using an autoregressive integrated moving average (ARIMA) model and smoothes the series using an HP filter.

Potential GDP

Potential GDP is then constructed by combining the trend labour input (L) and trend labour productivity (Y/L) estimates based on the following identity:

$$Y = L \cdot \frac{Y}{L}$$

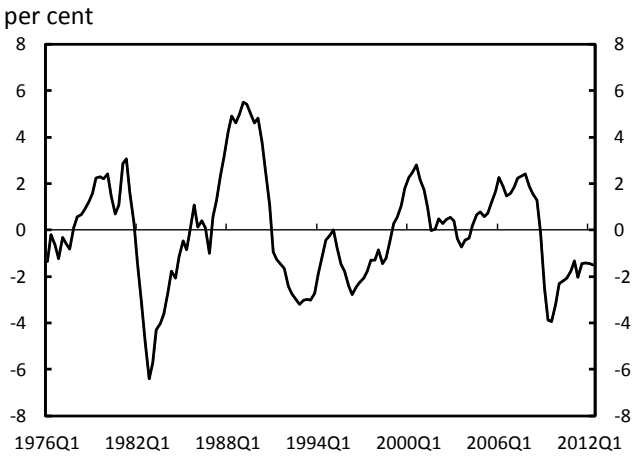
Output Gap

The output gap is the difference between real and potential GDP as a per cent of potential GDP. The output gap is an important concept since it is a more appropriate way to assess the state of the

economy across business cycles than analyzing output growth on its own. According to PBO calculations, the output gap in 2012Q3 was -1.7 per cent (Figure A-1).

Figure A-1

Output Gap, 1976Q1 to 2012Q3

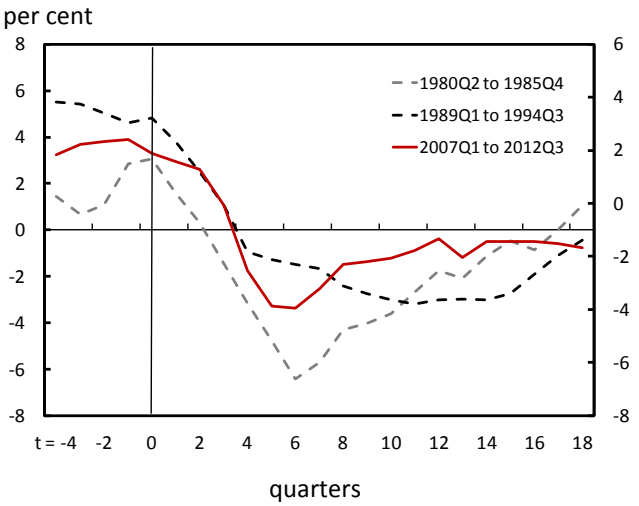


Source: Office of the Parliamentary Budget Officer.

Interestingly, while the output gap did not decline to the same degree as during previous economic cycles, it was larger in 2012Q3 than at the same point during previous economic cycles (Figure A-2).

Figure A-2

Output Gap Comparisions with Past Cycles



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Time t=0 corresponds to the employment gap peak.

Annex B
Disaggregated Labour Market Indicators

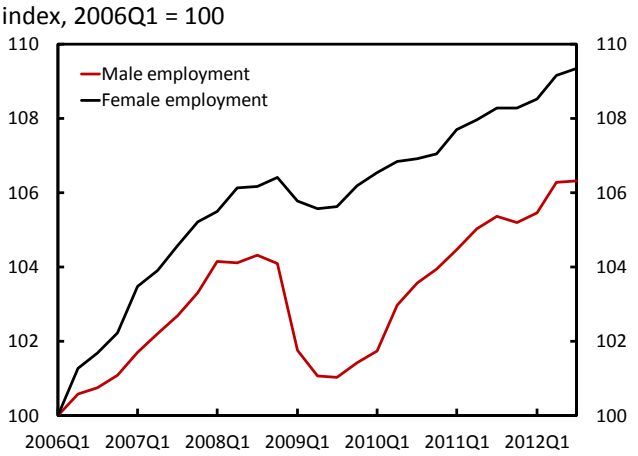
The aggregate labour market indicators analyzed in the main body of the paper can be disaggregated by age, sex, industry, full-time and part-time employment, class of employment (e.g. public and private), and temporary and permanent jobs.

Results by Sex and Industry

While men comprise just over half of those employed, they suffered about 75 per cent of the job losses in the recent recession (Figure B-1).

Figure B-1

Employment by Sex, 2006Q1 to 2012Q3

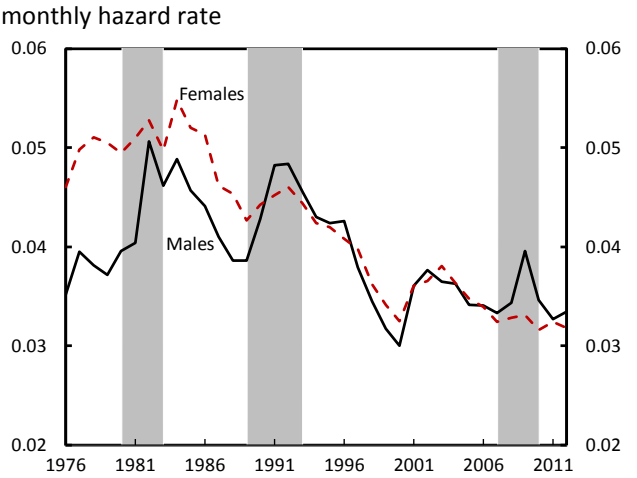


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Indeed, the general pattern of the most recent recession in Canada — where men in more cyclically sensitive industries were the most negatively affected — also occurred in previous Canadian recessions, as well as in the U.S. (see Hennessy and Yalnizian (2009) for Canada; and Hoynes et al. (2012) for the U.S.). Analyzing the historical Canadian LFS microdata further reveals that the recessionary increase in job separations (unemployment inflows) is almost entirely concentrated in males (Figure B-2).

Figure B-2

Estimated Unemployment Inflows, 1976 to 2012



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: The final month of data is September 2012. See Annex C for methodological details. Footnote 5 describes dates of the recession shading.

The male unemployment rate entered the recession at a higher level than the female unemployment rate and not surprisingly rose more sharply during the recession (Figure B-3). The gap between the two unemployment rates has returned to more normal levels in the recovery.

Underlying the unemployment rate dynamics is the troubling development that the participation rate among men, which fell during the recession, has yet to regain any lost ground since then (Figure B-4).

Indeed, over the last decade the participation rates of men have fallen overall — with the decline concentrated in those under 50 years old — whereas the participation rates of women have increased for all age groups (Figure B-5).

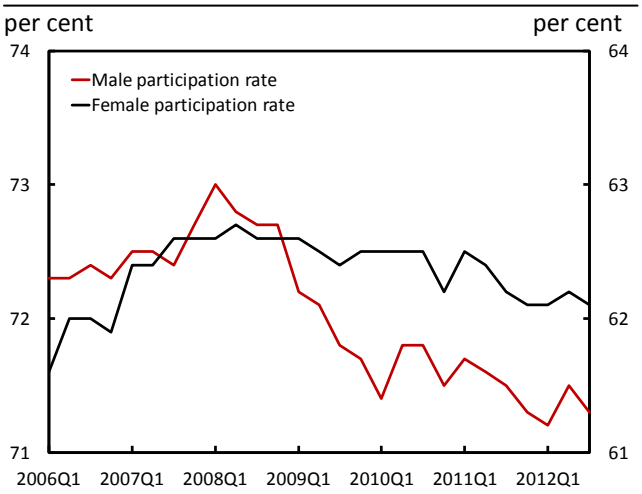
Figure B-3

Unemployment Rate by Sex, 2006Q1 to 2012Q3

Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Figure B-4

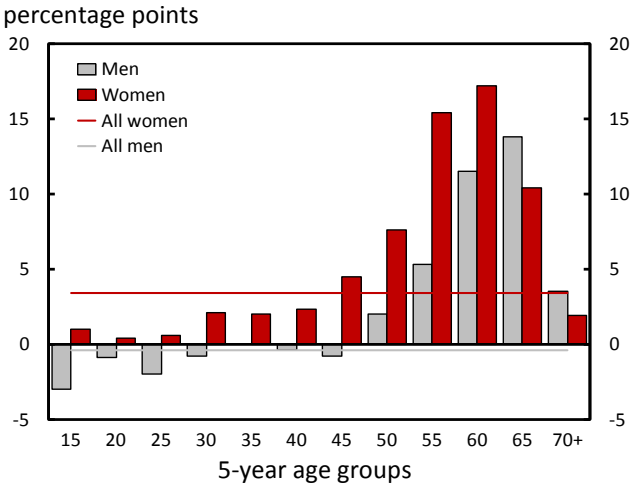
Participation Rate by Sex, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Figure B-5

Change in Labour Force Participation Rates by Age and Sex, 2001 vs. 2011



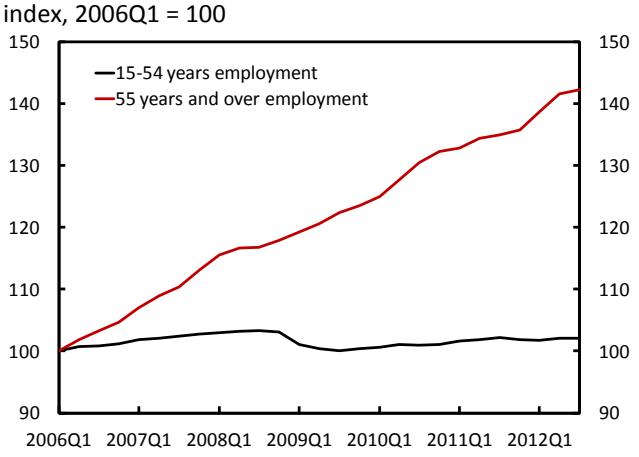
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Results by Age Group

Examining employment by age reveals that, while the level of employment among those 15-54 years has been broadly unchanged since 2006Q1, employment among those 55 years and over has grown strongly throughout the recession and recovery (Figure B-6).

Figure B-6

Employment by Age, 2006Q1 to 2012Q3

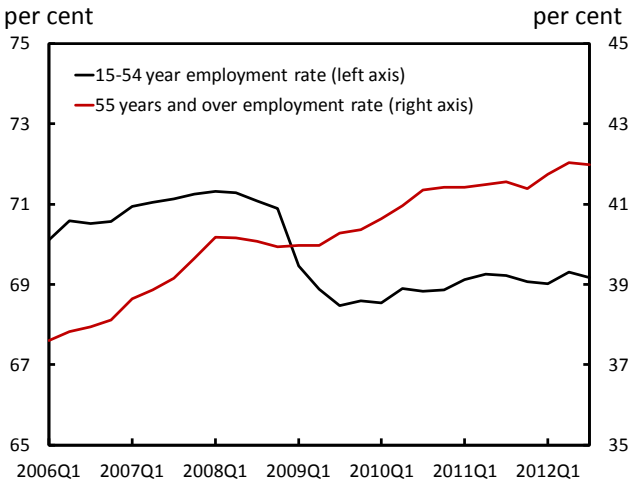


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Even after controlling for population changes with the employment rate, this phenomenon remains clear, with the employment rate among those aged 15-54 well below its pre-recession peak and broadly unchanged from its recessionary trough, while the employment rate for those aged 55 and over steadily increased (Figure B-7).

Figure B-7

Employment Rate by Age, 2006Q1 to 2012Q3

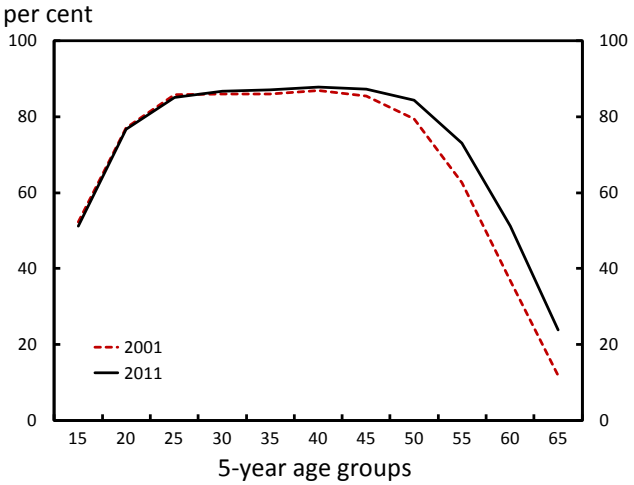


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Over the past decade, the increase in labour force participation was concentrated in workers over 50 years old (Figure B-8). On the other end of the spectrum, younger Canadians were also disproportionately affected by the recent recession, as Canadians aged 15-24 years saw their participation rate drop much more sharply than that of older workers, which reflects some people returning to further education (Figure B-9).

Figure B-8

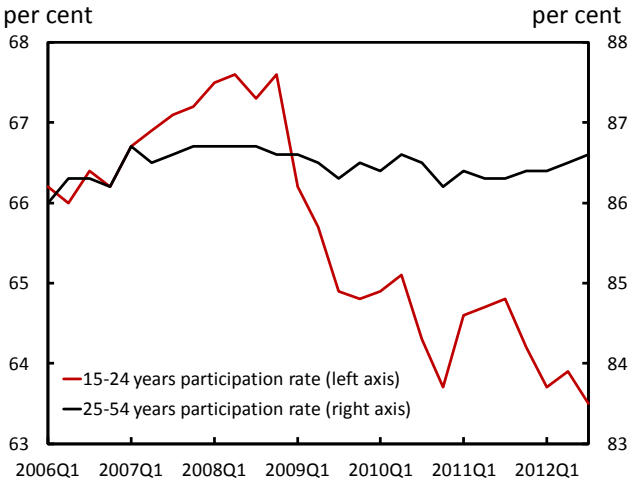
Aggregate Labour Force Participation Rates by Age, 2001 vs. 2011



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Figure B-9

Participation Rate by Age, 2006Q1 to 2012Q3

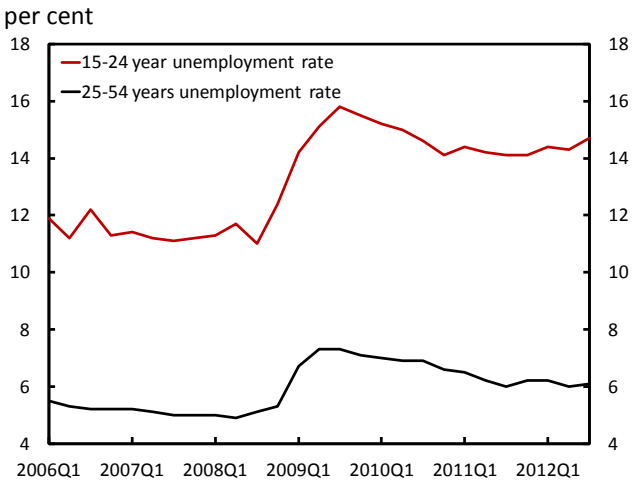


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Even despite the drop in participation rates, the youth unemployment rate increased significantly during the recession and remains well above that of Canadians in their prime working years (Figure B-10).

Figure B-10

Unemployment Rate by Age, 2006Q1 to 2012Q3



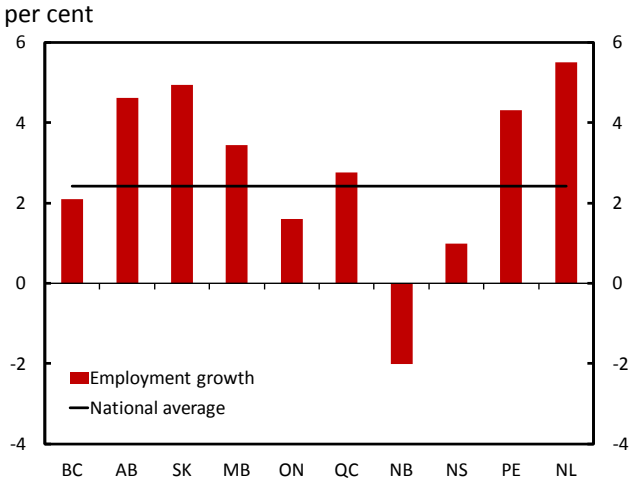
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Results by Province

Employment levels in all provinces are higher than before the recession began — except for New Brunswick (Figure B-11).

Figure B-11

Change in Provincial Employment, 2008Q3 to 2012Q3

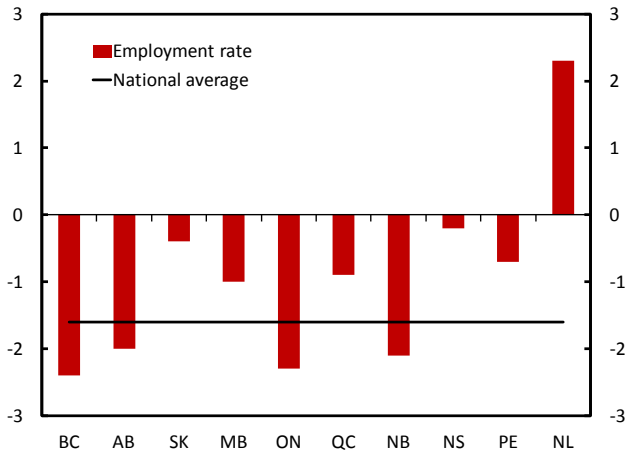


Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: The pre-recession peak is assumed to be 2008Q3 for all provinces, as this was the employment peak nationally.

However, when expressed as a share of labour force population, the employment rates for all provinces remain below their pre-recession peaks, with the exception of Newfoundland and Labrador (Figure B-12).

Figure B-12

Change in Provincial Employment Rate, 2008Q3 to 2012Q3



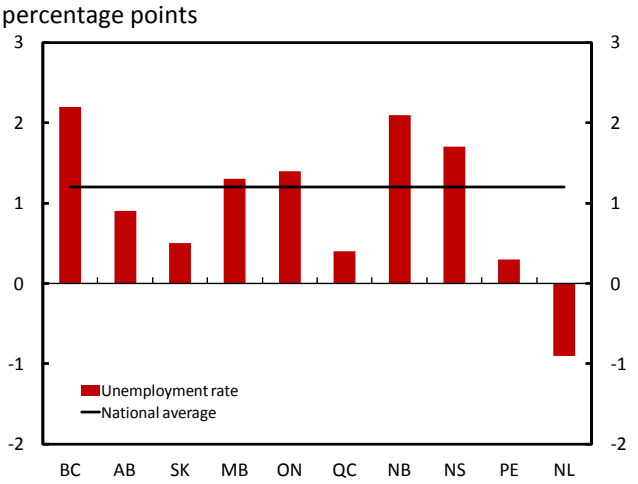
Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: The precession peak is assumed to be 2008Q3 for all provinces, as this was the employment peak nationally.

Because most provinces have a lower employment rate than before the recession, it is no surprise that most provinces also have higher unemployment rates than before the recession (Figure B-13). That said, the underlying causes of these elevated unemployment rates differ across provinces. For example, while British Columbia's unemployment rate remains high, this reflects a combination of strong population growth and a solid participation rate as opposed to weak employment growth. A similar story appears to be true in Nova Scotia. However, Ontario and New Brunswick appear to be leading the country in weak labour market performance, as indicated by multiple indicators. On the other hand, the labour market of Newfoundland and Labrador has outperformed all other provinces since 2008Q3 along multiple measures — including employment growth and the change in the employment, participation, and unemployment — relative to the pre-recession unemployment rate. At the same time, the relative

improvements in Newfoundland partially reflect weaker starting points relative to other provinces.

Figure B-13

Change in Provincial Unemployment Rate, 2008Q3 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

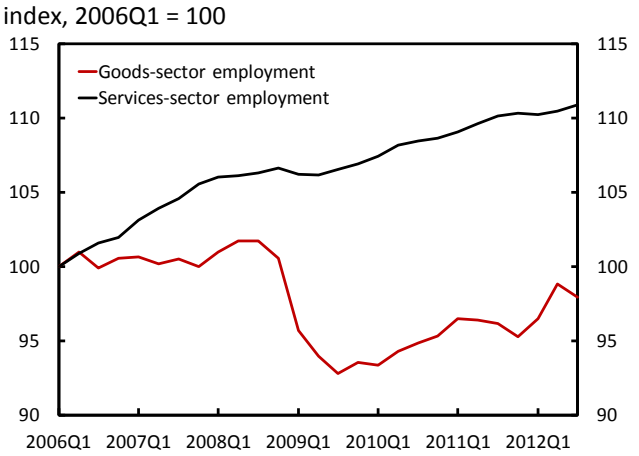
Results by Industry

During the recession, nearly 85 per cent of the jobs lost were in the goods-producing sector (e.g. construction and manufacturing) (Figure B-14), which are generally male-dominated fields (see Figure B-1). In fact, as of the third quarter of 2012, the level of employment in the goods-producing sectors remained below its pre-recession level.

More specifically, on average, almost three-quarters of the jobs created in the recovery were in the services-producing sector. In fact, employment in the goods-producing sector remains over 125,000 jobs below the pre-recession employment peak, due largely to continued weakness in the manufacturing sector. In contrast, employment in the services-producing sector is currently over 500,000 jobs above the pre-recession employment peak, largely due to gains in the health care and social assistance, educational services, and professional, scientific and technical services sectors. This mix of employment gains helps to explain why growth in public sector employment outpaced private sector employment during the recession and recovery (Figure B-15).

Figure B-14

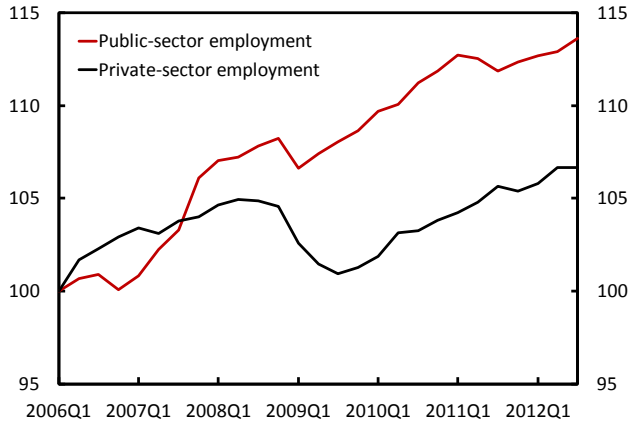
Employment by Industry, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Figure B-15

Employment by Class of Worker, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: The private-sector employment series does not include the self-employed.

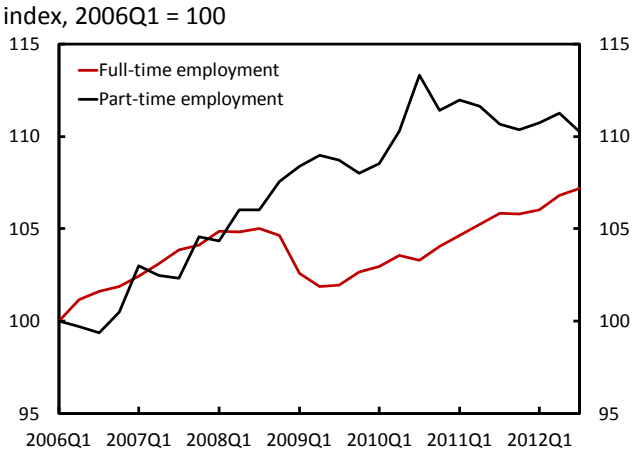
Employment Quality

While these labour market indicators provide an overview of the quantity of employment in Canada, these provide little on the "quality" of employment in Canada. As such, Figure B-16 compares the evolution of full-time and part-time work from 2006Q1 to the present. What is clear is that the brunt of the labour market weakness experienced during the recent recession was borne by full-time employment — although it has subsequently rebounded. In contrast, part-time employment continued to rise through the recession (possibly as a result of some substitution between full-time and part-time employment), but has steadily declined over the last two years along with the modest decline in involuntary part-time employment.

Another indicator of employment quality is permanent versus temporary employment (Figure B-17). Interestingly, while the level of permanent employment has roughly returned to its pre-recession peak, temporary employment has surged to a level in 2012Q3 which is much higher than its pre-recession peak, following a dramatic decline during the recession.

Figure B-16

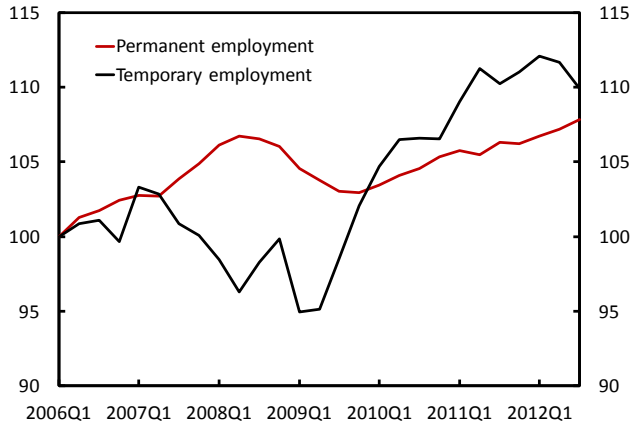
Full-Time and Part-Time Employment, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.

Figure B-17

Permanent and Temporary Employment, 2006Q1 to 2012Q3



Sources: Office of the Parliamentary Budget Officer; Statistics Canada.
Note: Permanent and temporary employment data were seasonally adjusted using the Census X12 approach.

Annex C
Estimating Unemployment Flows

Unemployment flows are estimated using a methodology developed by Shimer (2012) and Elsby et al. (2009). This approach was first applied to Canadian Labour Force Survey data by Campolieti (2011), covering the period of 1976-2008, which ended just as the global recession began.

The approach begins with the following equation to describe unemployment dynamics:[22]

$$u_{t+1} = (1 - F_t)u_t + u_t^S \qquad \text{(E.1)}$$

The level on unemployment next month, u_{t+1}, is the sum of two terms: the first term, $(1 - F_t)u_t$, is the number of unemployed who did not exit unemployment in the month, and who therefore, remain in the unemployment pool. F_t is the probability that a given unemployed person finds a job in the month (the 'job-finding' probability). The second term, u_t^S, is the 'short-term' unemployed (i.e. those with unemployment duration of four weeks or less) who are the new entrants into the unemployment pool.[23] Equation (E.1) can be rearranged to solve for the job-finding probability:

$$F_t = 1 - \left(\frac{u_{t+1} - u_t^S}{u_t}\right) \qquad \text{(E.2)}$$

Finally, the monthly **unemployment outflow hazard rate**, f_t, can be estimated from the job-finding probability using the following equation, which assumes that workers find jobs according to a Poisson process:

$$f_t = -\ln(1 - F_t). \qquad \text{(E.3)}$$

This result is often interpreted as an estimate of the rate at which the average unemployed person finds a job in the month.

The next step is to estimate the monthly **unemployment inflow hazard rate**, s_t. This is often called the 'separation' rate and interpreted as the rate at which the typical employed worker becomes unemployed. Estimating the inflow rate requires an adjustment for 'time aggregation bias.' This occurs because the Labour Force Survey records an individual's labour force status only during reference weeks — the week containing the 15th day of the month. As a result, the survey will miss jobs that are lost after one reference week, if the person finds a new job before the next survey — because they will be recorded as employed in both months despite the intervening unemployment spell. Effectively, the short-term unemployment series, u_t^S, will under-estimate the true flow into unemployment in the intervening month — and the under-estimation will be larger when jobs are easier to find (i.e., when the unemployment outflow, f_t, is higher). Shimer (2012) proposed a continuous time correction for this time aggregation bias, by solving the following non-linear equation for s_t:

$$u_{t+1} = u_t^* - (u_t - u_t^*)\exp -(s_t + f_t) \qquad \text{(E.4)}$$

where u_t^* is the 'steady-state' unemployment level given by $\left(\frac{s_t}{s_t + f_t}\right)l_t$, where l_t is the labour force.

Finally, the resulting monthly estimates for the unemployment inflows and outflows, s_t and f_t, which are based on non-seasonally adjusted data, are seasonally adjusted using Eviews X12 procedure and then aggregated to a lower frequency (quarterly or annual) by averaging the monthly seasonally adjusted series.

[22] This methodology ignores movements in and out of the labour force (the participation margin), however, several researchers have found that the cyclical properties of these estimates are not sensitive to this assumption (see, e.g. Elsby, Hobijn and Sahin, 2011).

[23] There is a break in short-term unemployment series, due to a redesign of the LFS questionnaire, which occurred between September 1996 and January 1997. Prior to this change, some people on temporary layoff were not identified as such, and were classified as "not in the labour force" rather than "unemployed". The 1997 redesign addressed this problem, resulting in more people on temporary layoff, which in turn, increased the number of people counted as the short-term unemployed. A correction for the 1997 LFS redesign was applied in a similar fashion to Elsby et. al (2009), who corrected for a similar break in the 1994 U.S. Current Population Survey. In the case of the LFS, the level of the series prior to September 1996 was multiplied by 1.265 to inflate prior values that were under-reported. The adjustment factor for men is 1.290 and for women 1.242 in calculating Figure B-2.