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Benchmarks for assessing labour market health: 2023 update

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Overview

This staff analytical note builds on Ens et al. (2021) to assess the health of the Canadian labour market. That earlier work proposed a more granular framework for assessing the labour market, given how diverse and segmented it is. Later, Ens et al. (2022) added a range of benchmarks to help answer questions that have a high degree of uncertainty, including the level of sustainable maximum employment.

In this note, we do two things:

- We update the range of benchmarks to ensure they remain relevant. This includes adding an additional year of data, adjusting for population aging and improving our methodology for estimating trends in light of the volatility in the data due to COVID-19. We also introduce some minor changes in the indicators used.
- We test risks around our assessment of a tight labour market. In particular, we examine whether the framework could be sending false signals given the rapid increase in population growth in recent quarters driven by higher immigration flows. This population growth is contributing to large month-to-month employment gains whose effects on the overall balance of the economy are hard to disentangle. We tackle this by examining an alternative version of the dashboard using supply and demand dimensions.

Despite the Bank of Canada's significant monetary policy tightening since the benchmarks were first established in 2021, the indicators point overwhelmingly to a labour market operating beyond what would be expected based on its historical performance. The dashboard continues to provide important insights into the labour market:

- Strength in the labour market is seen across almost all demographic groups, such as age, gender and education levels. Older male workers appear to be the only group lagging in their labour force participation rate.
- Signs point to a possibly long-lasting rise in the labour force participation of prime-working-age women. This may reflect changes in childcare policies and an increase in flexible work arrangements over the last several years.
- Currently, many Canadians who were entirely out of the labour force are transitioning directly into a job, bypassing the search stage and, therefore, unemployment. This dynamic reflects continued strong demand for workers.

The assessment of a tight labour market is confirmed by the new version of the dashboard that is more focused on the split between supply and demand.[1] Going forward, this split will be useful in monitoring the anticipated easing in labour market tightness. In particular, if the labour market becomes more balanced, we should see supply indicators remain strong while demand indicators weaken alongside measures of overall balance, such as wages.

[1] Moreover, analysis of the amount of disagreement between measures continues to suggest demand-led strength and low dispersion.

Updates to the benchmark range

To construct the range, we use estimates and values that each provide valuable but somewhat different takes on labour market strength. These include the Hodrick-Prescott and Hamilton filters (Hodrick and Prescott 1997; Hamilton 2018), the most recent period the labour input gap was closed (Ens et al. 2022), and model-based estimates used by Bank staff for potential output (Champagne et al. 2023). We bound these ranges by the historical minimum and maximum since 2003. Below are the key updates for 2022.

Additional year of data

We incorporate data released since the benchmarks were first constructed in early 2022.

Adjustments for population aging

The aging population affects several aggregate labour market indicators. Therefore, we have adjusted our 2019 benchmarks—included as a period in which the labour gap was likely closed—for population changes. In particular, the share of those who are 65 and older (and who typically have a lower attachment to the labour market) continues to increase relative to the working age population (22.3% in February 2023, compared with 21.9% in February 2022). This increase contributes to dampening employment and participation rates for both the aggregate and the 55 and older demographic groups. As a result, aggregate employment and participation rates consistent with 2019 averages have declined by 0.2 percentage points over the course of the past year.[2]

Modifications to trend filters

Disruptions from the COVID-19 pandemic caused massive swings in the labour market between 2020 and 2022. Because of this data volatility, including the Hamilton filter in the benchmark for this 2023 update is likely to cause unrealistic changes to the trend estimates. Therefore, we introduce a modified version.

The Hamilton filter uses past observations of a variable to obtain its cyclical component. Put simply, the cyclical component is the difference between the observed value of a variable in period $t + h$ and what would have been predicted using its historical behaviour up to time t.

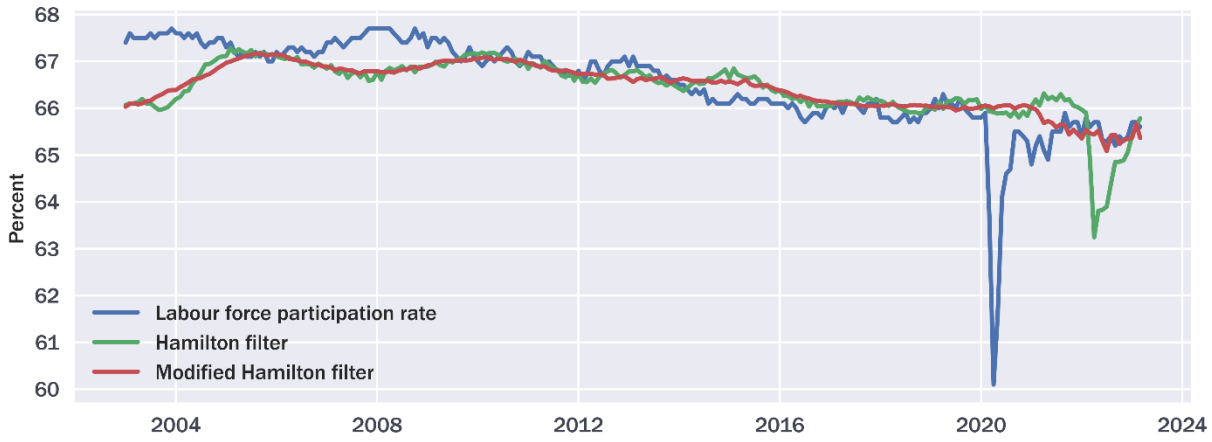
Hamilton (2018) outlines several advantages of a cyclical component. However, this component encounters issues when labour market data from the pandemic begin to inform the filter's trend prediction. In particular, the severe and unprecedented weakness in labour markets in 2020 shows up as very low labour market trends two years later. This is despite more recent data indicating an increasingly tight labour market during the recovery. As Quast and Wolters (2022) demonstrate, the original Hamilton filter overrepresents business cycles of between 10 and 20 quarters, at the expense of shorter and longer cycles.

To address this issue, we adopt the modified Hamilton filter proposed by Quast and Wolters (2022). This has two main benefits: first, more balanced coverage of business cycles of varying frequencies, and second, a smoother trend. In particular, the trend component of a variable is obtained as $\tilde{y}_t = \frac{1}{9}\sum_{h=4}^{12} \hat{y}_t^h$, where $\hat{y}_t^h$ are the predicted values from the Hamilton filter with *h*-quarter-ahead projections. As seen in **Chart 1**, which compares both filters for the participation rate, the modified

[2] This is after accounting for historical revisions to Statistics Canada's *Labour Force Survey*.

Hamilton filter does not transmit the large swings seen during the pandemic into the trend estimates eight quarters ahead. However, [it/the modified filter] is still based on the original Hamilton filter, which suggests the use of an $h = 8$-quarter-ahead prediction.

Chart 1: Trend estimates of labour force participation rate



Note: This chart plots the labour force participation rate as well as its trend estimates obtained from the Hamilton filter and the modified Hamilton filter.

Sources: Statistics Canada and Bank of Canada calculations

Last observation: March 2023

Additional estimate of the participation rate

We also incorporate estimates of the trend participation rate (TPR) computed by Bank staff into the range of benchmarks for the labour force participation rate. Age- and gender-specific participation rates are regressed against both their own lagged values and a set of cyclical labour demand variables and structural factors (e.g., age and cohort effects, employment insurance disincentives and the real after-tax interest rate). We then obtain the trend estimate as the aggregated dynamic fitted values arising from the regression. This approach to estimating TPR is outlined in Brouillette et al. (2019). For our estimate, we implement the model changes included in the 2023 assessment of potential output, as summarized in Champagne et al. (2023).

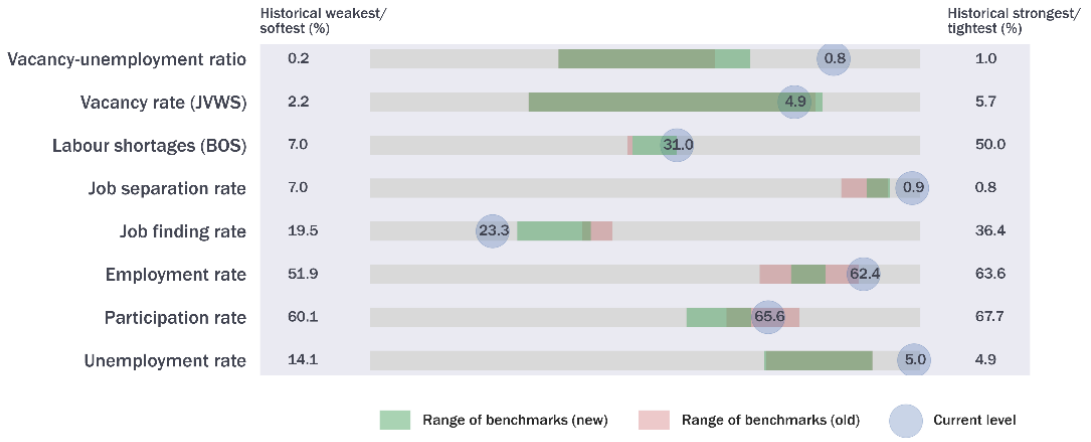
New indicator of market tightness: The vacancy-unemployment ratio

Beyond methodological changes, we have added market tightness as another indicator of overall labour market conditions. Market tightness is defined as the ratio of vacancies to the number of unemployed. It provides information on the overall balance between labour demand and the number of non-employed job seekers available to fill these openings. This addition is made possible by Statistics Canada's publication of monthly (including historical) vacancy data.

Assessment of overall labour market conditions

Chart 2 presents a sample of indicators and the associated changes in their benchmark ranges. We see some shifts—for example, the range for the employment rate is smaller than it used to be and the top of the range for the participation rate has been moved down. However, these changes do not dramatically alter the signals coming from the dashboard.

Chart 2: Measures of overall labour market conditions



Note: This chart presents the current value of labour market indicators when compared with their historical strongest and historical weakest. Benchmarks comprise the modified Hamilton filter for the new range, the Hamilton filter for the old range, and, for both ranges, the Hodrick-Prescott filter, the corresponding value of the indicator during a period when the labour input gap was closed and, for selected indicators, trend estimates produced by the Bank of Canada. Data for all series are from Statistics Canada's Labour Force Survey (LFS) unless otherwise noted. BOS is the Business Outlook Survey. JVWS is the Job Vacancy and Wage Survey. The vacancy-unemployment ratio is expressed as a ratio and not in percent. It is obtained using data from the LFS and JVWS.

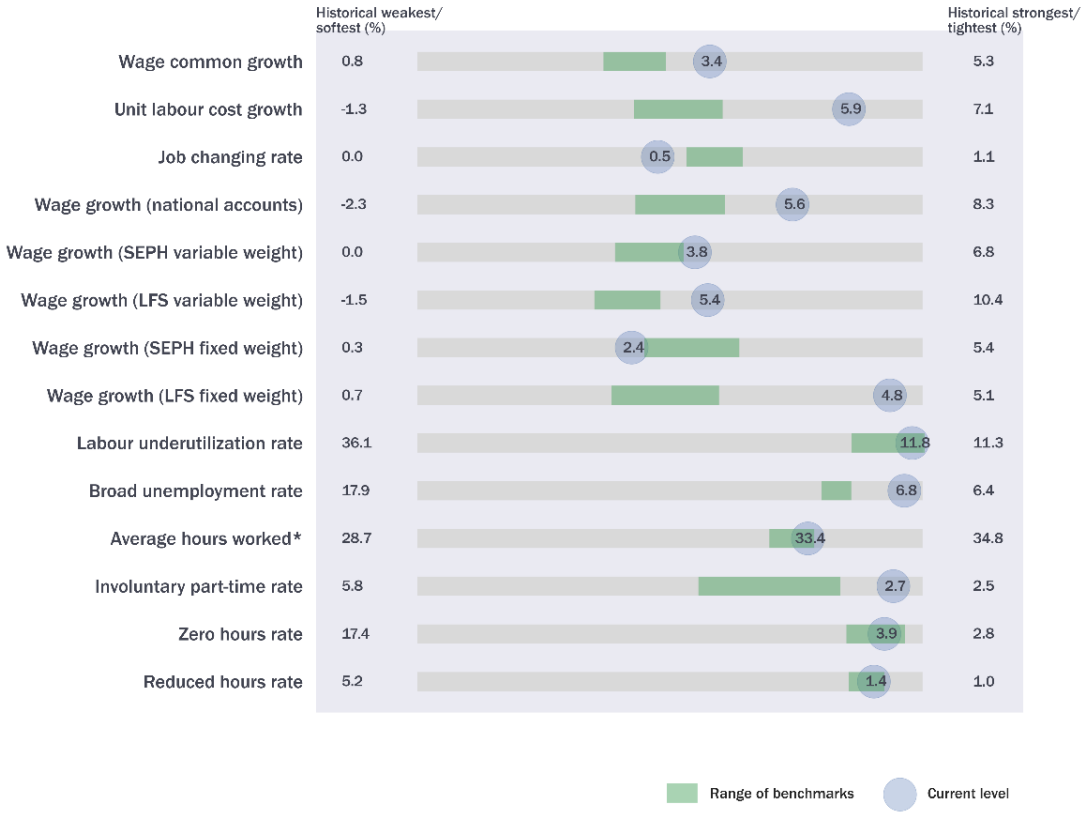
Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations

Last observations:
LFS, March 2023;
BOS, 2023Q1;
JVWS, January 2023

Across dimensions of overall conditions, job characteristics and inclusiveness (**Chart 2**, **Chart 3** and **Chart 4**), we continue to see that most indicators are sitting at the top of their respective ranges, or beyond. This picture has been largely unchanged since the benchmarks were introduced in April 2022.[3]

[3] See **Chart A-1** in the Appendix comparing labour market measures in April 2022 and March 2023.

Chart 3: Measures of job characteristics

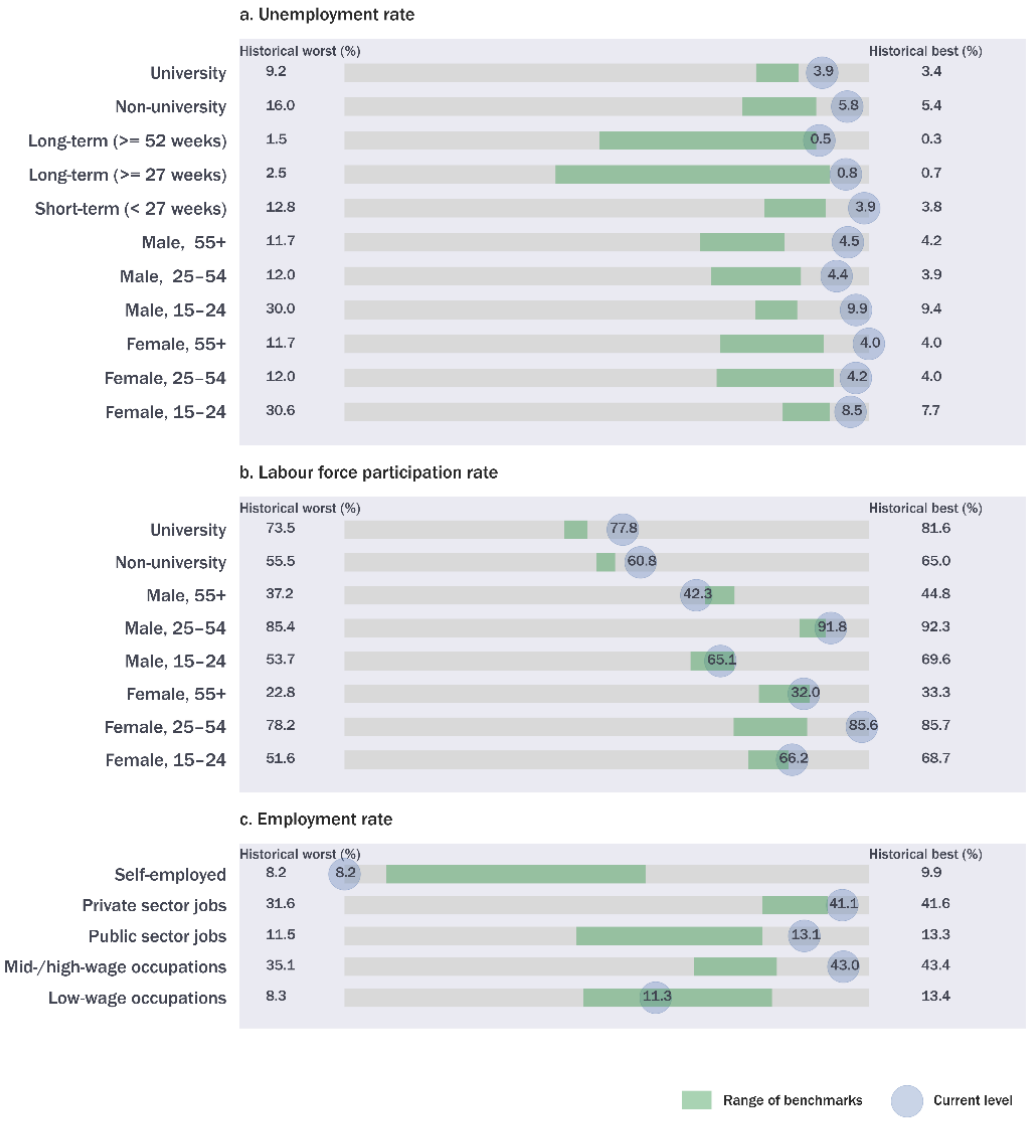


Note: This chart presents the current value of labour market indicators when compared with their historical strongest and historical weakest. Benchmarks comprise the modified Hamilton filter, the Hodrick-Prescott filter, the corresponding value of the indicator during a period when the labour input gap was closed and, for selected indicators, trend estimates produced by the Bank of Canada. Data for all series are from Statistics Canada's Labour Force Survey (LFS) unless otherwise noted. SEPH is Survey of Employment, Payrolls and Hours. Latest data for discontinued series (zero hours rate, reduced hours rate, and labour underutilization rate) are from December 2022.
*Average hours worked are expressed in hours and not percent.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations

Last observations:
LFS, March 2023;
LFS discontinued, December 2022;
SEPH, January 2023;
wage common, 2022Q4; national accounts, 2022Q4;
national accounts (wage measure), December 2022

Chart 4: Measures of labour market inclusiveness



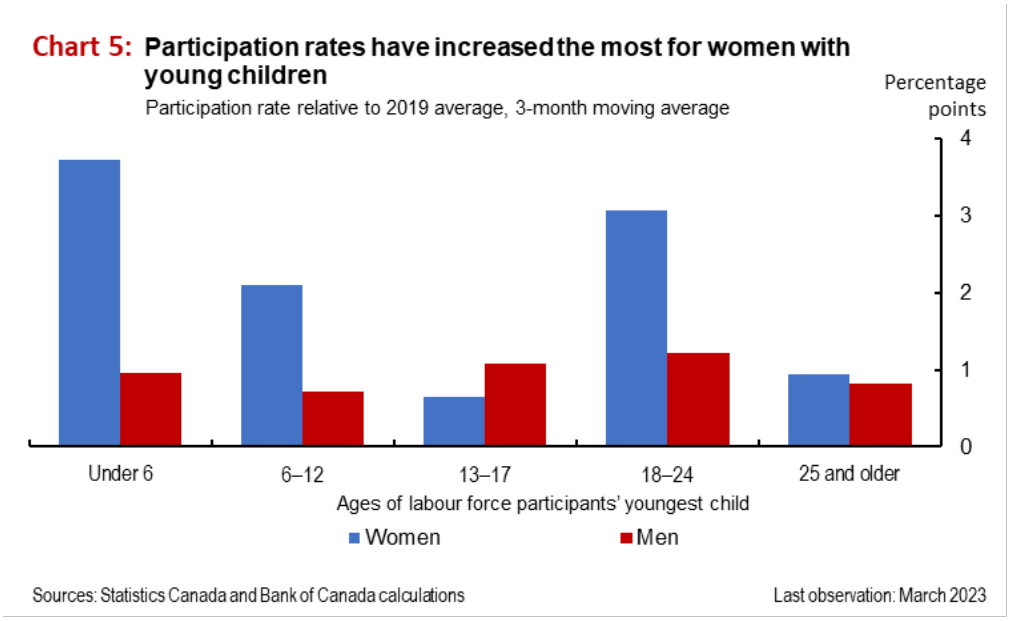
Note: This chart presents the current value of labour market indicators when compared with their historical strongest and historical weakest. Benchmarks comprise the modified Hamilton filter, the Hodrick-Prescott filter, the corresponding value of the indicator during a period when the labour input gap was closed and, for selected indicators, trend estimates produced by the Bank of Canada. Employment levels by wage are not seasonally adjusted.

Sources: Statistics Canada and Bank of Canada calculations

Last observation: March 2023

Several interesting insights emerge from the dashboard. The strength in the labour market is seen across almost all demographic groups when split by factors such as age, gender and education levels. Older male workers appear to be the only group lagging in their labour force participation rate. Self-employment is also at a series low, but this likely reflects labour market strength: previously self-employed workers may now be taking advantage of formal employment opportunities given the high demand for workers. Measures of how intensively workers are engaged in the labour market—such as average hours worked and the involuntary part-time rate—remain strong.

One notable insight is a possibly long-lasting rise in the labour force participation of prime-working-age women. The current rate is not only above its benchmark range but also near its historical maximum. This may reflect changes in childcare policies and an increase in flexible work arrangements over the last several years. We see this in **Chart 5**, which shows large increases in participation rates in women with young children.



Risks: Considering supply and demand balance

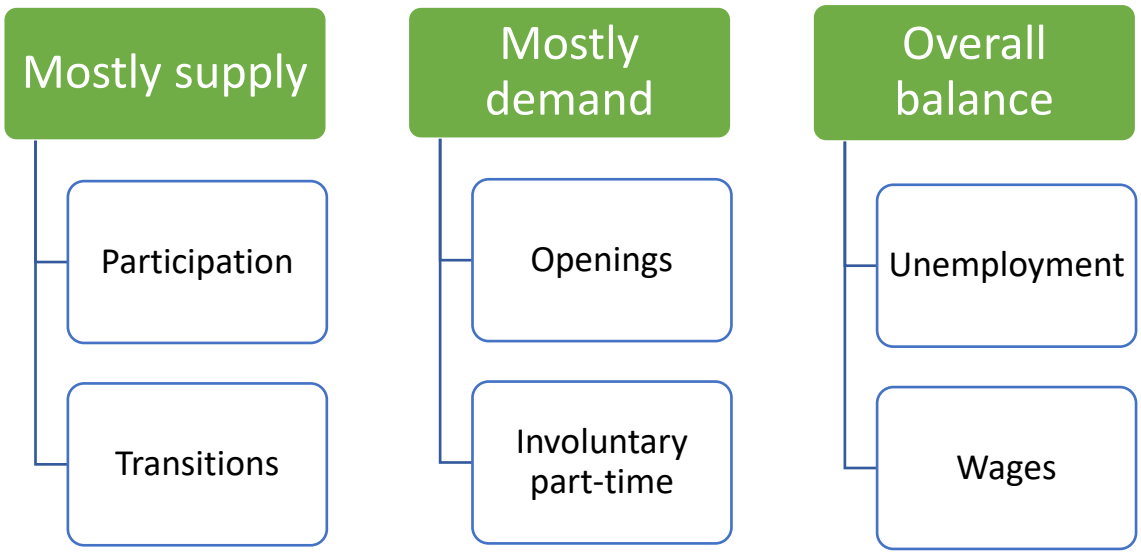
To test risks to the framework, we examine other versions of the data to see if they could change our assessment of a tight labour market. Specifically, we look at whether recent strong population growth could be confused with demand strength. If supply factors were indeed driving the strength in dashboard indicators, this would have the opposite implications for monetary policy than if the source was coming from demand. This difference could not be assessed just by looking at month-to-month employment changes, but instead would require a broader look at labour indicators.

We first scrub the existing list of indicators into three new categories. Many indicators are truly a mix of both supply and demand factors, and as a result we drop them from the analysis. We also add several indicators, such as the non-participation-to-employment rate. Overall, we are left with a slimmed-down dashboard, organized along the following dimensions (**Figure 1**):

- **Mostly supply*:*** This includes various measures of the participation rate, including different demographic cuts, though we recognize that cyclical pressure can boost its rate. We also include the transition of workers from non-participation into employment and unemployment. These measures help show how easy it is to pull workers in from outside the labour market.

- **Mostly demand:** For this category, we include measures of openings and labour shortages, which are signals of excess demand. We also include the involuntary part-time rate, a signal that people want to work more but are unable to.
- **Overall balance:** This category contains indicators that are *outcomes* of the overall balance between supply and demand in the labour market. In other words, they are not simply a mix of supply and demand factors—but instead are outcomes of the balance of supply and demand in the labour market. We include the unemployment rate because this tells us where the pendulum lies between a worker's ability to find a job and a firm's ability to fill it. We also include various wage measures as these are the price of labour.

Figure 1: Dimensions of indicators



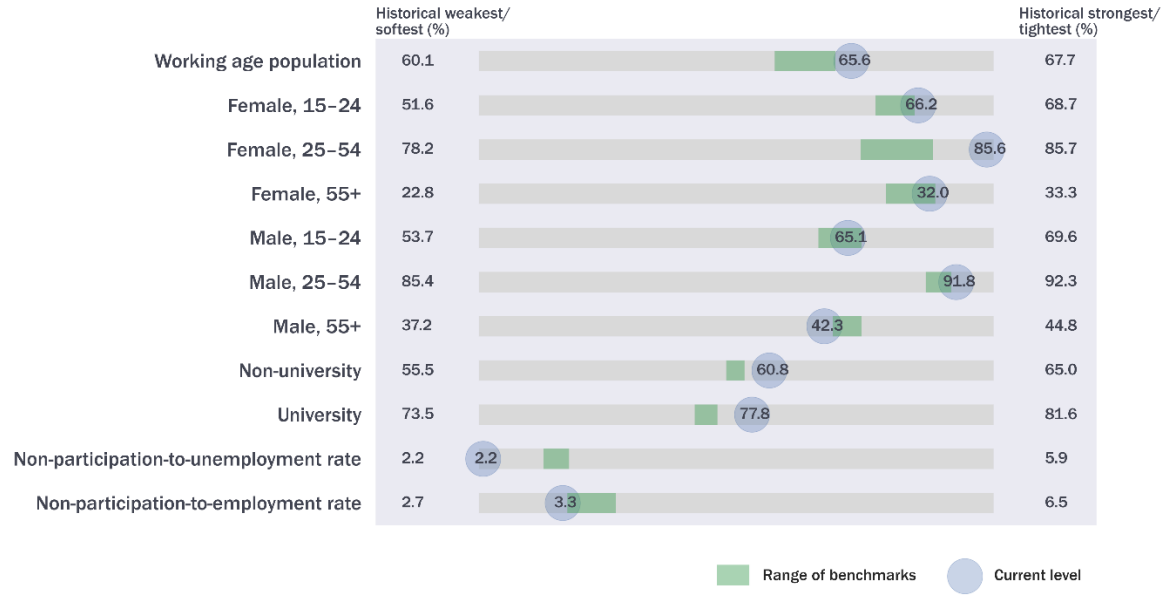
If the tightness in the labour market is indeed being driven by supply factors, we would expect to see the following:

- strength in the "mostly supply" indicators
- easing in the "mostly demand" indicators
- a softening in the "overall balance" indicators: all else being equal, the higher supply of workers should push down wages and push up the unemployment rate

What do we see in the data currently? For the "mostly supply" indicators, almost all participation rates are above their benchmark ranges (**Chart 6**), showing a strong role for supply forces.

Chart 6: Supply indicators are at the top of their ranges

Labour force participation (level and transitions)



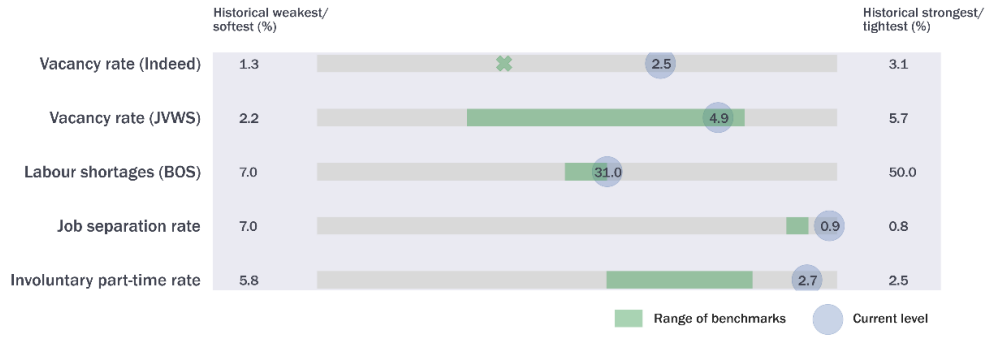
Note: This chart presents the current value of selected labour market indicators when compared with their historical strongest and historical weakest. Benchmarks comrpise the modified Hamilton filter, the Hodrick-Prescott filter, the corresponding value of the indicator during a period when the labour input gap was closed and, for selected indicators, trend estimates produced by the Bank of Canada. Data for all series are from Statistics Canada's Labour Force Survey (LFS).

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations

Last observation: March 2023

For the "mostly demand" indicators, we also see a picture of strength (**Chart 7**).

Chart 7: Demand indicators are strong



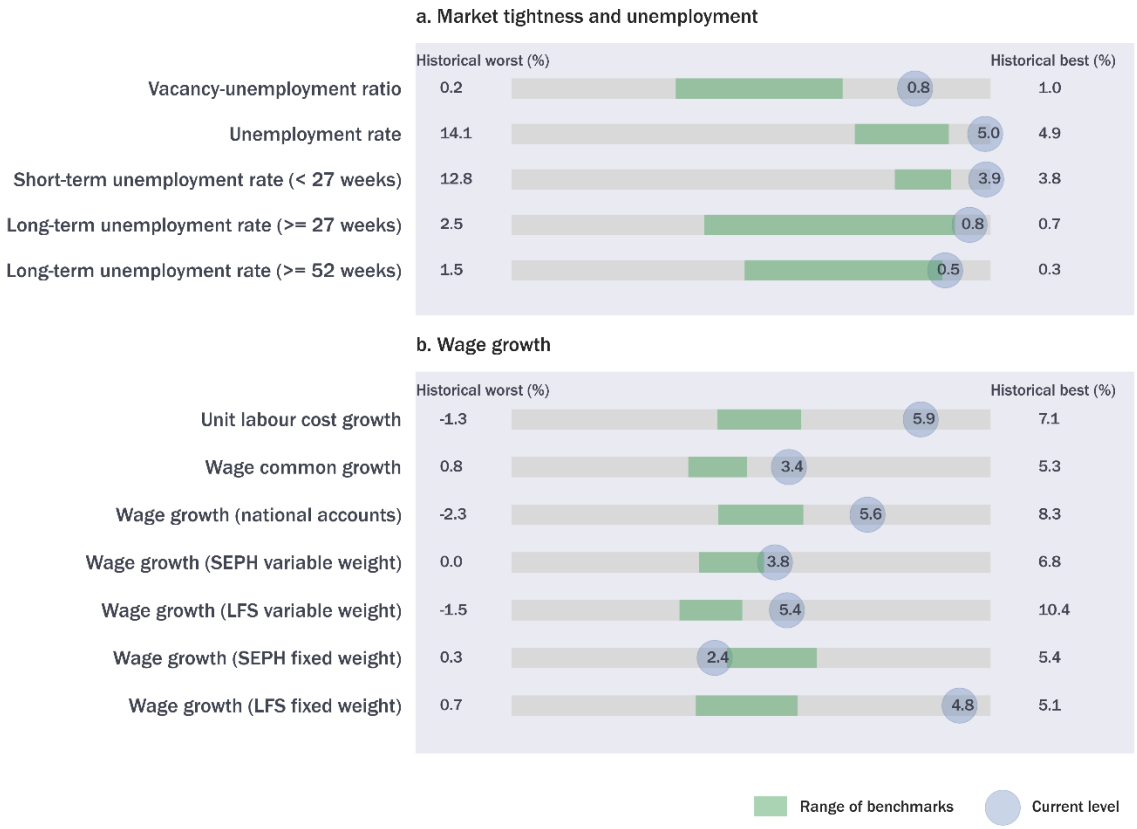
Note: This chart presents the current value of selected labour market indicators when compared with their historical strongest and historical weakest. Benchmarks comprise the modified Hamilton filter, the Hodrick-Prescott filter, the corresponding value of the indicator during a period when the labour input gap was closed and, for selected indicators, trend estimates produced by the Bank of Canada. The vacancy rate from Indeed.com is computed as the ratio of total Indeed.com job postings to the sum of private employment, public employment and Indeed.com job postings. Due to data limitations, this indicator is benchmarked against its 2019 average only. Data for all series are from Statistics Canada's Labour Force Survey (LFS) unless otherwise noted. BOS is Business Outlook Survey; JVWS is Job Vacancy and Wage Survey.

Sources: Statistics Canada, Indeed.com, Bank of Canada and Bank of Canada calculations

Last observations: LFS and Indeed.com, March 2023; BOS, 2023Q1; JVWS, January 2023

The “overall balance” indicators show few signs of weakness (**Chart 8**). Wage growth remains strong—and this is true across benchmarks and indicators. Unemployment rates remain around historical lows.

Chart 8: Wage growth and unemployment remain strong



Note: This chart presents the current value of selected labour market indicators when compared with their historical strongest and historical weakest. Benchmarks comprise the modified Hamilton filter, the Hodrick-Prescott filter, the corresponding value of the indicator during a period when the labour input gap was closed and, for selected indicators, trend estimates produced by the Bank of Canada. Data for all series are from Statistics Canada’s Labour Force Survey (LFS) unless otherwise noted. SEPH is Survey of Employment, Payrolls, and Hours. The vacancy-unemployment ratio is expressed as a ratio and not in percent. It is obtained using data from the LFS and the Job Vacancy and Wage Survey (JVWS).

Sources: Statistics Canada and Bank of Canada calculations

Last observations:
LFS, March 2023;
SEPH, January 2023;
wage common, 2022Q4; national accounts, 2022Q4;
national accounts (wage measure), December 2022;
JVWS, January 2023

Across the dimensions, we find evidence that strong demand is driving the observed tightness in the dashboard but in a context of elevated supply growth. While this does not change our current assessment of the state of the labour market, these additional cuts of the data will likely be useful as we go forward. They allow us to assess how the rebalancing of the labour market is going as monetary policy further cools the economy.

Box 1: Testing for supply- and demand-driven strength through the level of dispersion among indicators

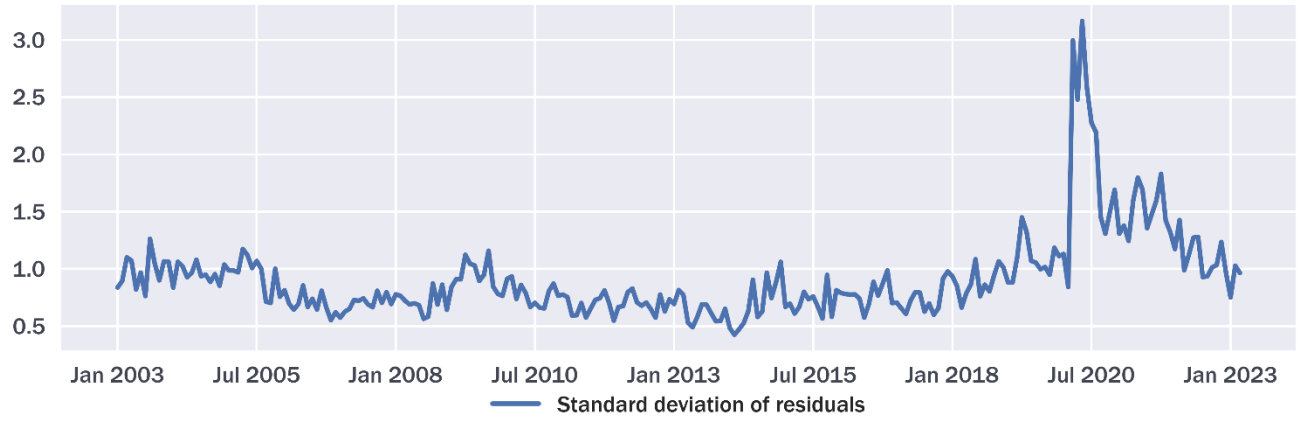
Another way to test if supply strength is driving the dashboard is to look at the amount of disagreement, or dispersion, among indicators. If supply is driving labour market outcomes, we would expect to see wage, unemployment and demand indicators soften and conversely, supply indicators rise. Put another way, as the supply of workers increases, wages should, all else being equal, drop. Given the conflicting movements, measures of dispersion should increase. This is in contrast to demand-driven strength, which would also have some positive effects on both participation rates and indicators of overall balance, lowering dispersion.

To assess whether dispersion has increased, we turn to the expanded labour market indicator (Ens et al. 2021). This indicator is a summary measure of labour market conditions that uses principal component analysis to extract the common movement across a wide range of labour indicators. In this case, we use it to examine the amount of disagreement between measures to more systematically track and quantify unevenness in the labour market. We calculate the deviations of individual indicators from their values as predicted by the principal component analysis and standardize them.

We can see the results in **Chart 1-A**. Dispersion spiked during the early months of the COVID-19 pandemic, given the unevenness of the shock on different sectors of the labour market and therefore on workers. Since that time, we see a steady overall decrease in dispersion, including throughout 2022. This result reinforces the conclusion that demand strength is driving a tight labour market.

Chart 1-A: No increase in 'disagreement' – which would rise with a supply-led story

Unexplained variation of labour market measures



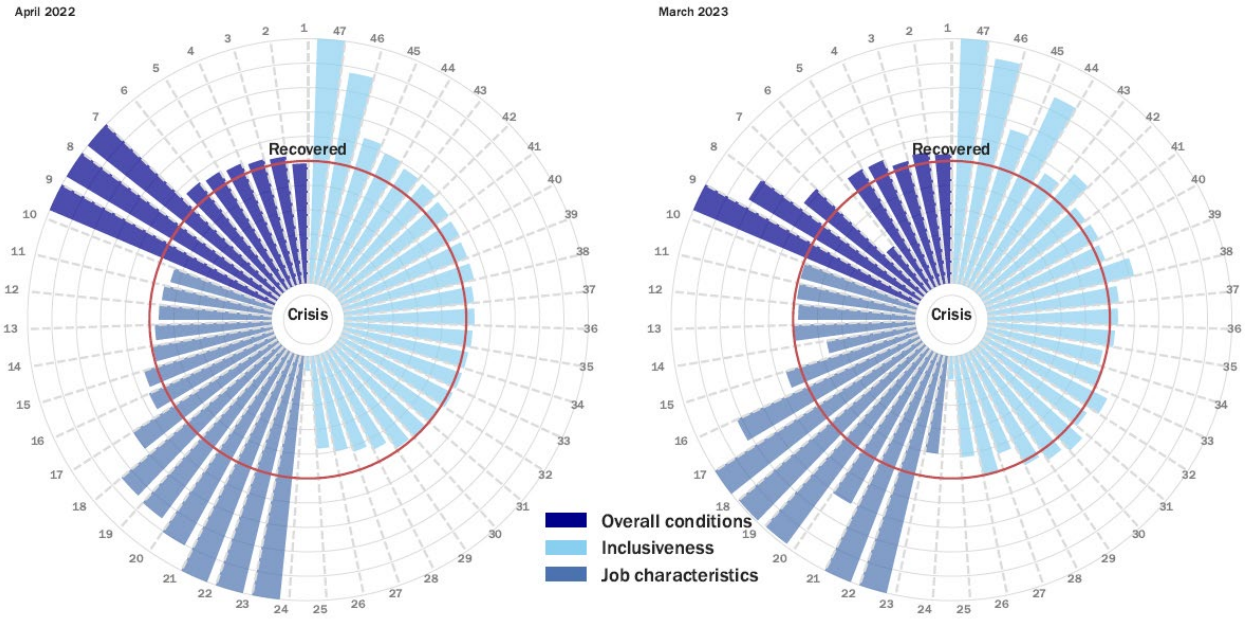
Note: This chart plots the standard deviation of the standardized residuals of all input measures for each period in our sample. We calculate standardized residuals as the deviation of the actual value of a measure from its predicted value based on the first three principal components, normalized by historical deviations. We use a Hodrick-Prescott filter to detrend all data series identified as non-stationary. For details on the construction of this indicator, see E. Ens, L. Savoie-Chabot, K. See and S. L. Wee, "Assessing labour market slack for monetary policy," Bank of Canada Staff Discussion Paper No. 2021-15 (October 2021).

Sources: Statistics Canada and Bank of Canada calculations

Last observation: March 2023

Appendix

Chart A-1: Summary of labour market measures



1 -- Total hours worked
2 -- Unemployment rate
3 -- Job separation rate
4 -- Employment rate
5 -- Participation rate
6 -- Job finding rate
7 -- Labour shortages (BOS)
8 -- Market tightness
9 -- Vacancies (JVWS)
10 -- Average hours worked
11 -- Reduced hours rate
12 -- Zero hours rate
13 -- Labour underutilization rate
14 -- Job changing rate
15 -- Broad unemployment rate
16 -- Wage growth (LFS variable weight)
17 -- Wage growth (LFS fixed weight)
18 -- Involuntary part-time rate
19 -- Wage common growth
20 -- Wage growth (SEPH variable weight)
21 -- Unit labour cost growth
22 -- Wage growth (national accounts)
23 -- Wage growth (SEPH fixed weight)
24 -- Employment level index, self-employed
25 -- Labour force participation rate, male, 55+
26 -- Unemployment rate, long-term (>= 52 weeks)
27 -- Employment level index, low-wage
28 -- Unemployment rate, long-term (>= 27 weeks)
29 -- Unemployment rate, female, 55+
30 -- Unemployment rate, male, 55+
31 -- Unemployment rate, female, 25–54
32 -- Unemployment rate, male, 15–24
33 -- Labour force participation rate, female, 15–24
34 -- Labour force participation rate, male, 15–24
35 -- Unemployment rate, female, 15–24
36 -- Unemployment rate, non-university
37 -- Unemployment rate, short-term (< 27 weeks)
38 -- Labour force participation rate, university
39 -- Unemployment rate, university
40 -- Unemployment rate, male, 25–54
41 -- Labour force participation rate, male, 25–54
42 -- Employment level index, private sector
43 -- Labour force participation rate, non-university
44 -- Labour force participation rate, female, 55+
45 -- Labour force participation rate, female, 25–54
46 -- Employment level index, mid-/high-wage
47 -- Employment level index, public sector

Note: This chart illustrates the extent to which measures of labour market health have recovered across select labour market indicators. A full bar implies that the measure has fully recovered, while a bar on the centre ring implies that the measure is at its crisis trough. LFS is Labour Force Survey; BOS is Business Outlook Survey; JVWS is Job Vacancy and Wage Survey. For a full list of indicators see E. Ens, C. Luu, K. See and S. L. Wee, "Benchmarks for assessing labour market health," Bank of Canada Staff Analytical Note No. 2022-2 (April 2022). Latest data for discontinued series (zero hours rate, reduced hours rate and labour underutilization rate) are from December 2022.

Sources: Statistics Canada, Bank of Canada and Bank of Canada calculations

Last observations:
LFS, March 2023; LFS (discontinued), December 2022; SEPH, January 2023; BOS, 2023Q1; JVWS, January 2023; Wage common, 2022Q4; National accounts, 2022Q4; National accounts (wage measure), December 2022

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