BANK OF CANADA
BANQUE DU CANADA

Monetary Policy Report

July 2022

Canada's inflation-control strategy

Inflation targeting and the economy

- The objective of Canada's monetary policy is to promote the economic and financial well-being of Canadians. Canada's experience with inflation targeting since 1991 has shown that the best way that monetary policy can achieve this goal is by maintaining a low and stable inflation environment. Doing so fosters confidence in the value of money and contributes to sustained economic growth, a strong and inclusive labour market and improved living standards.
- In 2021, the Government of Canada and the Bank of Canada renewed the flexible inflation-targeting strategy of the monetary policy framework for a further five-year period, ending December 31, 2026.[1]
- The inflation target was renewed at the 2% midpoint of the 1%–3% control range, with inflation measured as the 12-month rate of change in the consumer price index (CPI).
- The Government and the Bank agreed that the best contribution monetary policy can make to the economic and financial well-being of Canadians is to continue to focus on price stability. The Government and the Bank also agreed that monetary policy should continue to support maximum sustainable employment, recognizing that maximum sustainable employment is not directly measurable and is determined largely by non-monetary factors that can change through time.
- Further, the Government and the Bank agreed that because well-anchored inflation expectations are critical to achieving both price stability and maximum sustainable employment, the primary objective of monetary policy is to maintain low, stable inflation over time.

Inflation targeting is *symmetric* and *flexible*

- Canada's inflation-targeting approach is *symmetric*, which means the Bank is equally concerned about inflation rising above or falling below the 2% target.
- Canada's inflation-targeting approach is also *flexible*. Typically, the Bank seeks to return inflation to target over a horizon of six to eight quarters. However, the most appropriate horizon for returning inflation to target will vary depending on the nature and persistence of the shocks buffeting the economy.
- The 2021 agreement with the Government specifies that the 2% inflation target remains the cornerstone of the framework.
- The agreement further notes that the Bank will continue to use the flexibility of the 1%–3% control range to actively seek the maximum sustainable level of employment, when conditions warrant. The Bank will also continue to leverage the flexibility inherent in the framework to help address the challenges of structurally low interest rates by using a broad set of policy tools. The Bank will use this flexibility only to an extent that is consistent with keeping medium-term inflation expectations well anchored at 2%.

Monetary policy tools

- Because monetary policy actions take time to work their way through the economy and have their full effect on inflation, monetary policy must be forward-looking.
- The Bank normally carries out monetary policy through changes in the target for the overnight rate of interest (the policy rate). The Bank also has a range of monetary policy tools it can use when the policy rate is at very low levels. These tools consist of guidance on the future evolution of the policy rate, large-scale asset purchases (quantitative easing and credit easing), funding for credit measures, and negative policy rates. The potential use and sequencing of these tools would depend on the economic and financial market context.
- All of the Bank's monetary policy tools affect total demand for Canadian goods and services through their influence on market interest rates, domestic asset prices and the exchange rate. The balance between this demand and the economy's production capacity is, over time, the main factor that determines inflation pressures in the economy.

Communications

- Consistent with its commitment to clear, transparent communications, the Bank regularly reports its perspectives on the economy and inflation. Policy decisions are typically announced on eight pre-set days during the year, and full updates of the Bank's outlook are published four times each year in the *Monetary Policy Report*.
- The Bank is committed to explaining when it is using the flexibility of the inflation-targeting strategy.
- Given the uncertainty about the maximum sustainable level of employment, the Bank will consider a broad range of labour market indicators.[2] The Bank will also systematically report to Canadians on how labour market outcomes have factored into its policy decisions.

Monitoring inflation

- In the short run, the prices of certain CPI components can be particularly volatile and can cause sizable fluctuations in CPI inflation.
- In setting monetary policy, the Bank seeks to look through such transitory movements in CPI inflation and focuses on a set of "core" inflation measures that better reflect the underlying trend of inflation. In this sense, these measures act as an operational guide to help the Bank achieve the CPI inflation target. They are not a replacement for CPI inflation.
- The Bank's three preferred measures of core inflation are CPI-trim, which excludes CPI components whose rates of change in a given month are the most extreme; CPI-median, which corresponds to the price change located at the 50th percentile (in terms of basket weight) of the distribution of price changes; and CPI-common, which uses a statistical procedure to track common price changes across categories in the CPI basket.

1 For more details, see *Joint Statement of the Government of Canada and the Bank of Canada on the Renewal of the Monetary Policy Framework* (December 13, 2021); *Monetary Policy Framework Renewal—December 2021;* and T. Macklem, "*Our Monetary Policy Framework: Continuity, Clarity and Commitment*" (speech to the Empire Club of Canada, Toronto, December 15, 2021).

2 See, for example, the range of indicators that the Bank is using to track the recovery of the labour market from the effects of the COVID-19 pandemic.

The *Monetary Policy Report* is available on the Bank of Canada's website at bankofcanada.ca.

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Monetary Policy Report

July 2022

This is a report of the Governing Council of the Bank of Canada:
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Contents

Overview

Inflation around the world has continued to rise quickly, largely due to increases in the prices for energy and food. Global supply chain challenges have also persisted, and when combined with strong demand, this has led to a broadening in price pressures.

Global growth is slowing due to Russia's aggression in Ukraine and continued supply chain disruptions. As well, high inflation and monetary policy tightening in many countries are beginning to moderate demand.

With the removal of most public health restrictions in Canada, economic activity in hard-to-distance service sectors has rebounded strongly. With the rest of the economy already more than fully recovered, the Canadian economy is now clearly in excess demand. While high inflation in Canada is largely the result of international factors, domestic demand pressures are becoming more prominent, and price pressures have broadened.

In response to high inflation and rising inflation expectations, the Bank of Canada is raising interest rates. This will temper borrowing and spending, slow demand growth, help anchor inflation expectations and ultimately reduce inflationary pressures.

Key messages

- Inflation continues to rise, and price pressures are broadening. Consumer price index (CPI) inflation will average close to 8% in the middle quarters of 2022. Survey responses show that consumer and business expectations about inflation over the next two years have moved higher.
- The Canadian economy is overheated, and labour markets are tight. The unemployment rate is at a series low, and elevated job vacancies and widespread labour shortages are pushing up wage growth. With strong demand for their products, businesses are passing through higher input and labour costs to consumer prices.
- With global growth moderating and higher interest rates dampening domestic spending, growth in Canada is projected to slow from 3½% in 2022 to 1¾% in 2023 and 2½% in 2024. This allows supply to catch up with demand, reducing domestic inflationary pressures.
- Domestic price pressures are expected to abate, global supply chain problems are anticipated to resolve gradually, and energy prices are projected to decline. Inflation in Canada is anticipated to decrease to roughly 3% by the end of 2023 and return to the 2% target by the end of 2024.
- The Bank is guarding against the risk that high inflation becomes entrenched because if it does, restoring price stability will require even higher interest rates, leading to a weaker economy.

Global economy

The global economy is facing multiple headwinds. Inflation is high worldwide and continues to increase, largely due to surging energy and food prices. Supply challenges are contributing to inflationary pressures as demand is recovering from the pandemic. Global economic activity is estimated to have declined in the second quarter of 2022 because of the war in Ukraine and the lockdown of some major cities in China to limit the spread of COVID-19. Growth in US private domestic demand is also estimated to have slowed sharply. Many central banks are tightening monetary policy to combat increasingly broad-based inflationary pressures. As a result, financial conditions have tightened, and this is weighing on global growth.

Growth should rebound in the third quarter as restrictions ease in China, but higher interest rates and the war in Ukraine will continue to restrain activity. The Bank projects global growth to moderate to about 3¼% in 2022 and 2% in 2023—a slower pace than projected in the April Report mostly because of tighter monetary policy (**Table 1** and **Box 1**). Global growth is expected to strengthen to 3% in 2024 once the war's impact on growth subsides.

Table 1: Projection for global economic growth

	Share of real global GDP* (%)	Projected growth† (%)			
		2021	2022	2023	2024
United States	16	5.7 (5.7)	1.9 (2.8)	1.1 (1.9)	1.1 (1.5)
Euro area	12	5.3 (5.3)	2.7 (3.0)	1.0 (2.3)	2.5 (2.6)
Japan	4	1.7 (1.7)	1.5 (2.0)	2.3 (2.5)	1.5 (1.3)
China	18	8.1 (8.1)	3.6 (4.3)	5.4 (4.9)	5.2 (5.0)
Oil-importing EMEs‡	33	8.6 (8.5)	4.5 (4.2)	1.5 (2.2)	3.2 (3.5)
Rest of the world§	16	5.1 (5.0)	2.7 (2.4)	0.6 (1.0)	2.8 (3.0)
World	100	7.0 (7.0)	3.3 (3.5)	2.0 (2.5)	3.0 (3.2)

* GDP shares are based on International Monetary Fund (IMF) estimates of the purchasing-power-parity valuation of country GDPs for 2020 from the IMF's October 2021 *World Economic Outlook*. The individual shares may not add up to 100 due to rounding.

† Numbers in parentheses are projections used in the previous Report.

‡ The oil-importing emerging-market economies (EMEs) grouping excludes China. It is composed of large EMEs from Asia, Latin America, the Middle East, emerging Europe and Africa (such as India, Brazil and South Africa) as well as newly industrialized economies (such as South Korea).

§ "Rest of the world" is a grouping of other economies not included in the first five regions. It is composed of oil-exporting EMEs (such as Russia, Nigeria and Saudi Arabia) and other advanced economies (such as Canada, the United Kingdom and Australia).

Source: Bank of Canada

Box 1

Changes to the economic projection since the April Report

Global GDP outlook

Projected growth in global gross domestic product (GDP) has been revised down significantly since the April Report. It is reduced by about ¼ of a percentage point in 2022, ½ a percentage point in 2023 and ¼ of a percentage point in 2024. Overall, the level of GDP at the end of 2024 is roughly ¾% lower.

The following factors explain the downward revisions to the outlook:

- Given the stronger-than-expected inflation, monetary policy is now expected to be tighter over the projection horizon in both advanced and emerging-market economies. As well, credit conditions tightened more than anticipated.
- Government spending in the United States is weaker, partly due to a slower rollout of infrastructure spending.
- China's growth forecast for 2022 is lower because COVID-19 containment measures affecting major cities have lasted longer than anticipated.

Canadian GDP outlook

GDP growth in 2022 and 2023 has been revised down significantly to 3½% and 1¾%, respectively. The forecast for growth has been lowered by about ¾ of a percentage point in 2022 and by about 1½ percentage points in 2023. Growth in 2024 has been revised up by ¼ of a percentage point to 2½%. These revisions leave the level of real GDP about 1¾% lower in 2024.

The following key factors contribute to the reduced GDP profile:

- Supply has been revised down over the projection horizon (see **Box 2**).
- Inflation is higher, financial conditions are tighter, and household wealth is lower. As a result, the outlook for household expenditures has been revised down over the projection horizon.
- The effects of supply chain disruptions on economic activity—notably in the manufacturing sector—are lasting longer than expected.
- Foreign demand has been revised down in 2023 and 2024 partly due to tighter global financial conditions, leading to lower exports and business investment.

Canadian CPI inflation outlook

Consumer price index (CPI) inflation is anticipated to be substantially higher than projected in April. The outlook for CPI inflation has been revised up by almost 2 percentage points to 7.2% in 2022, by 1.8 percentage points to 4.6% in 2023, and by 0.2 percentage points to 2.3% in 2024. These revisions mainly reflect more persistent and broad-based inflationary pressures than previously estimated. They also reflect higher commodity prices and wider-than-usual gasoline refinery margins as well as rising inflation expectations. In addition, higher estimates of excess demand in 2022 raise the inflation forecast in 2022 and into 2023.

Still-elevated energy prices

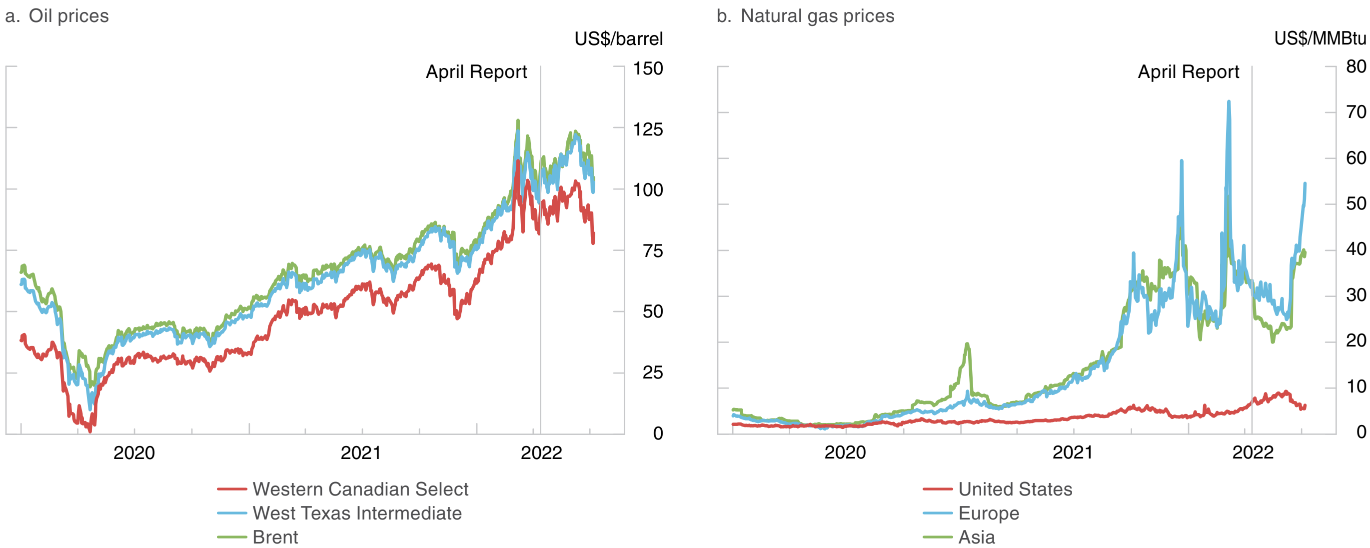
Energy prices remain volatile (**Chart 1**). Since the April Report, Brent crude oil prices have fluctuated between about US$100 and US$125 per barrel. Oil prices fell in early May due to reduced demand from China in the wake of COVID-19 containment measures. Supply concerns, including the European Union's ban on Russian oil imports, subsequently pushed prices up. Over the past month, prices have fallen due to concerns about a significant slowdown in global growth.

Prices of natural gas have also been volatile. While they remain high in Europe and Asia due to concerns about Russia's supply of natural gas, prices fell recently in North America. Prices of refined products, such as gasoline and diesel, are disproportionally higher than oil prices because of low inventories and reduced refining capacity as well as war-related disruptions.

Looking ahead, Brent oil prices are assumed to fall slowly to US$100 by the end of 2024 (**Box 2**). Prices for West Texas Intermediate (WTI) and Western Canadian Select (WCS) are assumed to follow similar patterns, remaining

Chart 1: Energy prices remain volatile

Daily data



Note: Oil price data for April 20, 2020, are excluded because disruptions in the oil futures market led to negative values of around -US$48 for Western Canadian Select and -US$38 for West Texas Intermediate on that day. Price data for all other days in the date range are included. European natural gas prices are converted from euros per megawatt hour to US dollars per metric million British thermal units (MMBtu). Prices in the United States are based on the Henry Hub benchmark, European prices are based on the Dutch Title Transfer Facility natural gas benchmark, and Asian prices are based on the Japan–Korea Marker for liquefied natural gas.

Sources: NYMEX and Intercontinental Exchange via Haver Analytics and Bank of Canada calculations Last observation: July 7, 2022

US$5 and US$20 below Brent prices, respectively. With this outlook, the Bank assumes that the impact of war-related factors on oil prices diminishes gradually.

Risks around the outlook for oil prices are two-sided. Russia may face additional sanctions for its invasion of Ukraine that could further reduce Russian oil production. This would put more upward pressure on oil prices. In contrast, price pressures could be lower if the war-related uncertainty dissipates faster than expected or if Russia exports more of its oil to Asia.

Since the April Report, the Bank's non-energy commodity price index has fallen by roughly 15%. Prices for base metals have declined sharply because of concerns about global demand, particularly demand from China. Lumber prices also fell abruptly due to weakening housing activity in North America. Prices of agricultural products have declined, reflecting favourable weather that is boosting harvest prospects. Even with the recent decline, prices for most non-energy commodities are still likely to stay above their pre-pandemic levels over the projection horizon.

High and widespread inflation globally

Inflation is high and becoming more broad-based across goods and services in most regions. Short-term inflation expectations are elevated in many countries. Surging energy and food prices remain key contributors to inflation. Elevated demand is leading to a broadening of inflationary pressures, allowing high energy prices to pass through to other prices.

Box 2

Key inputs to the projection

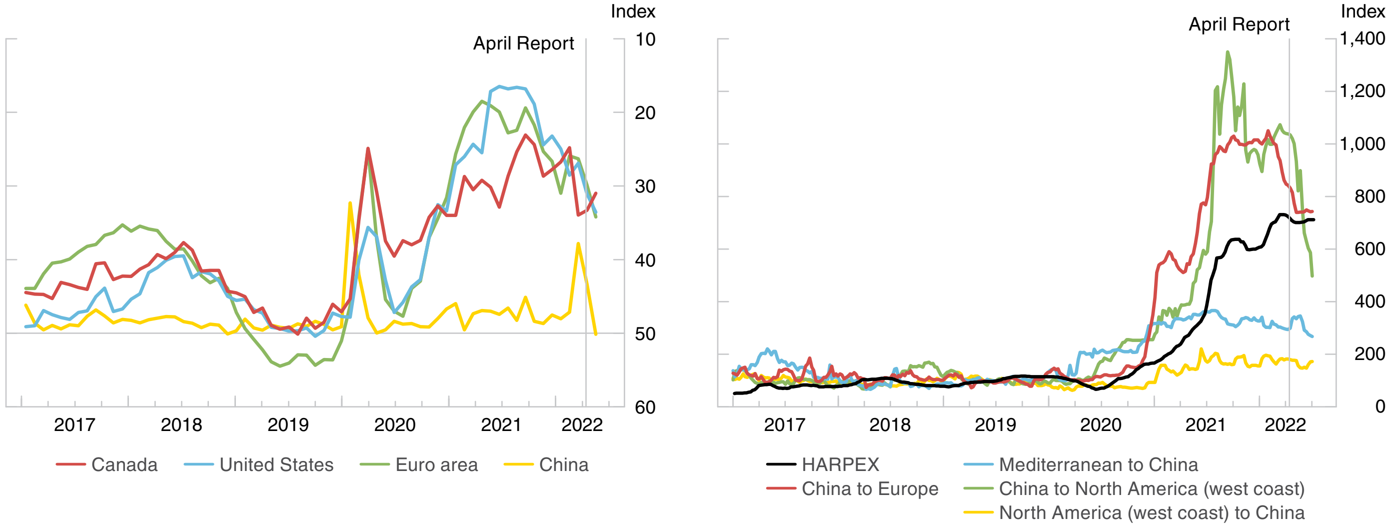
The Bank of Canada's projection is always conditional on several key assumptions, and changes to these will affect the outlook for the Canadian economy. The Bank regularly reviews these assumptions and how they may impact the economic projection. The key inputs into the Bank's projection are as follows:

- Public health restrictions have largely been removed in many countries. It is assumed that remaining measures will be lifted over the course of 2022 in most of the world. Containment measures in China, however, are expected to loosen more gradually—and even periodically tighten—over 2022 and 2023.
- In Canada, most public health restrictions have been lifted. Pandemic-related effects on consumer caution and travel are assumed to continue to fade over the projection horizon.
- The projection incorporates information from all available provincial and federal budgets.
- Oil prices are assumed to gradually decrease over the projection horizon from their current elevated levels. The price of Brent stays near US$115 per barrel for the third quarter of 2022 and then declines to about US$100 by the end of 2024. The prices for West Texas Intermediate (WTI) and Western Canadian Select (WCS) follow similar dynamics, with a constant spread below the price for Brent of US$5 and US$20, respectively. Brent and WTI oil prices are about US$10 above the level assumed in the April Report. The spread between WTI and WCS is US$5 wider than assumed in the April Report, reflecting a broad-based rise in the premium of light oil over heavy oil.
- By convention, the Bank does not forecast the exchange rate in the *Monetary Policy Report*. The Canadian dollar is assumed to remain at 78 cents US over the projection horizon, close to its recent average and slightly below the 79 cents US assumed in the April Report.
- The pandemic is having both temporary and lasting effects on the supply side of the Canadian economy. As in recent reports, the Bank distinguishes between supply and potential output to account for the episodic nature of some supply decreases that are caused by pandemic-related factors, such as public health measures and supply chain disruptions.
  - The Bank's assessment of potential output, a longer-term concept, looks through the short-lived effects of factors related to the pandemic. As in the April Report, potential output growth (excluding temporary factors) is expected to average about 2% per year over 2022–24.
  - The projection assumes that short-term factors, such as supply chain disruptions, are reducing the supply of goods and services. These factors are assumed to have a maximum negative impact of about 2½% on the level of supply in the second and third quarters of 2022. This effect is expected to start decreasing in the fourth quarter and to dissipate beyond the projection horizon. Both the magnitude and the persistence of the effects of supply disruptions are larger than in the April Report. Supply chain disruptions are estimated to have larger and longer-lasting implications for business operations than previously assumed.
  - Estimates of overall growth in supply can be obtained by combining the estimates of the temporary effects of these short-term factors with the assessment of potential output. Supply growth is projected to be around ¾% in 2022 and to average roughly 2¾% over 2023–24.
- Gross domestic product (GDP) is estimated to have grown at a stronger-than-potential pace in the second quarter of 2022 amid supply chain disruptions. As a result, the Bank estimates that the output gap—the difference between GDP and supply—was between 0.5% and 1.5% in the second quarter. This is further into positive territory than the estimate of -0.25% to 0.75% for the first quarter of 2022.
- The nominal neutral policy interest rate is defined as the real neutral rate plus 2% for inflation. The real neutral rate is defined as the rate consistent with both output remaining sustainably at its potential and inflation remaining at target, on an ongoing basis. It is a medium- to long-term equilibrium concept. For Canada, the projection is based on the assumption that the nominal neutral rate is at the midpoint of the estimated range of 2% to 3%. This range was last reassessed in the April 2022 Report.

Chart 2: Supply bottlenecks are easing modestly

a. PMI: Manufacturing suppliers' delivery times, monthly data

b. Transportation costs, index 2019 = 100, weekly data



Note: The Purchasing Managers' Index (PMI) is a diffusion index of business conditions. For suppliers' delivery times, an inverted index is used to show that a reading less than (greater than) 50 indicates an increase (decrease) in delivery times compared with the previous month. All series in panel b are from the Freightos Baltic Index except the HARPEX (Harper Petersen Charter Rates Index). The Freightos Baltic Index provides market ocean freight rates for different trade lanes. The HARPEX reflects the worldwide price development on the charter market for container ships.

Sources: S&P Global and HARPEX via Haver Analytics and Freightos Baltic Index via Bloomberg Finance L.P.

Last observations: PMI, June 2022; HARPEX, July 8, 2022; Freightos Baltic Index, July 3, 2022

Widespread supply shortages continue to be an important source of global inflationary pressure. While shipping costs have moderated and supplier delivery times have improved slightly in recent months (**Chart 2**), lockdowns in China and the war in Ukraine have caused new supply disruptions. The Bank assumes that global supply challenges will ease over the next year.

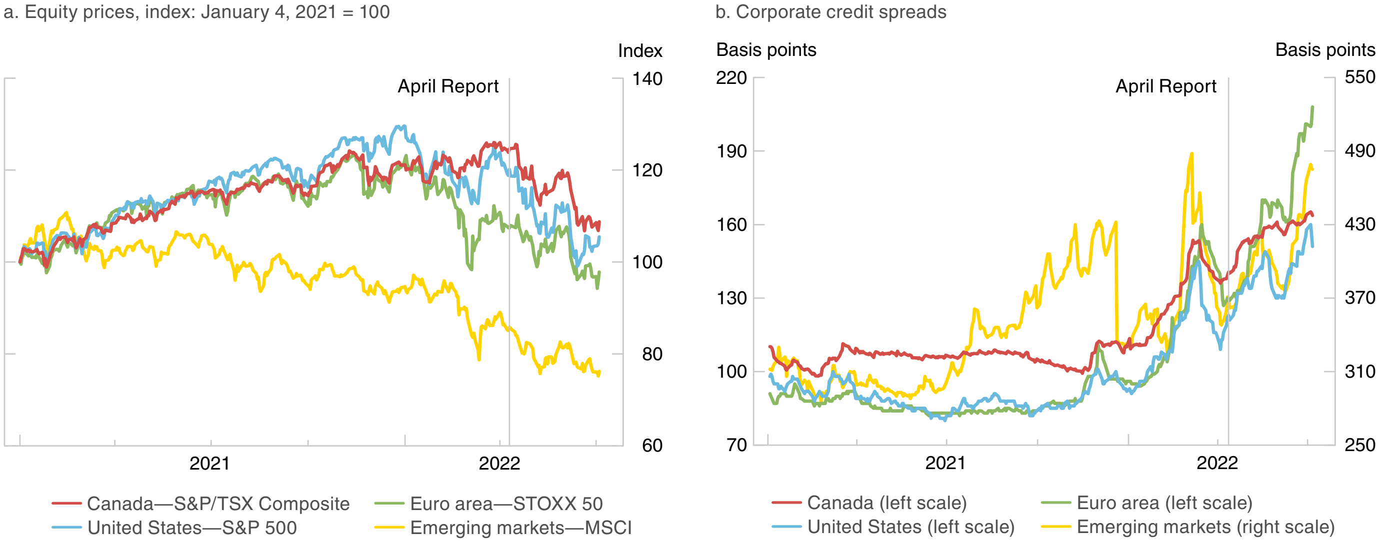
Inflation is projected to rise further and to peak in most regions in the third quarter of this year. It is expected to gradually decline thereafter because, in the projection, the effects of past increases in energy and food prices dissipate, energy prices decline, supply challenges ease, and demand slows.

Tighter global financial conditions

Global financial conditions are more restrictive than in the April Report. Equity prices have declined, and corporate bond spreads have widened (**Chart 3**). Global government bond yields have experienced significant volatility since the April Report. They initially rose as central banks in advanced and emerging economies continued to tighten monetary policy. Yields on longer-term government bonds have retreated somewhat over the past few weeks due to concerns about the prospects for global growth but remain higher than in April. The Canadian dollar depreciated against the US dollar, although less so than most other currencies.

Chart 3: Financial conditions have tightened

Daily data



Note: The spreads for the United States and emerging markets are the option-adjusted spreads between US-dollar-denominated bonds and US Treasury securities. Spreads for Canada and the euro area are relative to Canadian and German sovereign yields, respectively. All corporate yields are based on investment-grade bonds, except for those of emerging markets that include a number of high-yield bonds.

Sources: Bloomberg Finance L.P. and Bank of Canada calculations

Last observation: July 7, 2022

Sharp slowdown after robust growth in the United States

The US economy is in excess demand, and the labour market is tight. Job openings are near record levels, and the unemployment rate is close to a 40-year low. Wage growth has been rising rapidly over the past year, though not by enough to keep up with inflation. However, consumption and housing activity have weakened considerably in recent months as high inflation and the rising path of interest rates reduce demand.

To combat high inflation, the Federal Reserve has increased the target range for the federal funds rate by 150 basis points since the start of 2022. In June, the Federal Reserve also started reducing the size of its balance sheet—a process known as quantitative tightening.

The US economy is on track to grow by about 2% in 2022, supported by the ongoing recovery and households spending their previously accumulated savings. Consumption and business investment are expected to slow as higher interest rates work their way through the economy. GDP growth in the United States is anticipated to moderate to about 1% in 2023 and in 2024.

War disruptions and rising inflation in the euro area

The war in Ukraine and associated uncertainty are weighing heavily on the euro area economy. Surging energy prices and trade disruptions are dampening production. High inflation is eroding household purchasing power and hurting consumer confidence. In response to elevated inflation, the European Central Bank ended its net asset purchases and announced plans to raise its policy rates in the coming months. Overall, growth is projected to slow from 2¾% in 2022 to 1% in 2023. Growth is expected to pick up in 2024 as the effects of the war and elevated energy prices fade.

Lockdowns in China

China's economy likely contracted in the second quarter because of strict measures to contain outbreaks of COVID-19. Lockdowns in important manufacturing and trading hubs temporarily hampered production and trade and have compounded challenges with global supply chains. Mobility restrictions and the ongoing correction in the property sector are weighing on domestic demand.

Authorities have introduced several policies to stimulate growth, including additional infrastructure spending, targeted tax cuts and lower mortgage rates. China's economy should rebound in the third quarter of 2022 because of this policy stimulus and the recent easing of lockdown measures. Uncertainty about the growth outlook remains high, given the fragility of the property sector and the risk of even more intense lockdowns if another wave of COVID-19 occurs.

Multiple headwinds in emerging-market economies

The war in Ukraine, high energy prices and, to a lesser extent, China's lockdowns are hampering growth in oil-importing emerging-market economies (EMEs), particularly in Europe and Asia. The sharp tightening of financial conditions in many EMEs is also weighing on domestic demand. As a result, growth is expected to moderate in 2022 and 2023 before picking up in 2024 as the effects of these headwinds dissipate.

Activity in the rest-of-the-world group is held back by tighter global financial conditions and by the sharp contraction of the Russian economy due to economic sanctions. However, other oil-exporting countries are expected to benefit from increased oil revenues.

Canadian economy

Inflation continues to rise and broaden in Canada, reflecting widespread cost pressures. Global factors—including high prices for energy, food and tradable goods—are driving most of the surge. In addition, excess demand in the Canadian economy is playing a more significant role. It is making firms more likely to pass cost increases on to consumers, leading to a broadening of inflationary pressures.

Businesses and consumers increasingly think that inflation will be higher for longer, and they are more uncertain about the future path of inflation. This points to an increasing risk that elevated inflation will become entrenched.

CPI inflation is forecast to average around 8% in the middle quarters of 2022. It is then projected to ease to roughly 3% by the end of 2023 and return to target by the end of 2024. Inflation declines as the impact of higher energy prices dissipates, supply challenges recede, and monetary policy in Canada and abroad reduces domestic and foreign demand. In this projection, inflation is considerably higher and more persistent than in the April Report (see **Box 1** on page 3 and the **Appendix** on page 26).

Growth has been robust over the past year as the Canadian economy recovered from the worst effects of the pandemic. Strong housing markets, high commodity prices and the easing of public health restrictions have boosted economic activity. However, economic growth is now showing signs of slowing. The effects of higher prices and interest rates have begun to weigh on household spending. In particular, a sharp slowdown in the housing market is underway.

Overall, economic growth is forecast to be strong in 2022 at about 3½% and to moderate to about 1¾% in 2023 and 2½% in 2024 (**Table 2**). Growth slows largely due to the impact of high inflation and tighter financial conditions on consumption and housing activity. A weaker outlook for global growth also weighs on exports and business investment. The Canadian growth outlook is revised down in 2022 and 2023 relative to the April Report.

Table 2: Contributions to average annual real GDP growth

Percentage points*†

	2021	2022	2023	2024
Consumption	2.8 (2.8)	2.8 (2.9)	1.0 (2.2)	1.5 (1.4)
Housing	1.3 (1.3)	-0.7 (-0.5)	-0.6 (-0.2)	0.2 (0.2)
Government	1.5 (1.3)	0.4 (0.4)	0.5 (0.5)	0.3 (0.3)
Business fixed investment	0.2 (0.2)	0.7 (0.7)	0.2 (0.6)	0.6 (0.7)
Subtotal: final domestic demand	5.8 (5.6)	3.2 (3.5)	1.1 (3.1)	2.6 (2.6)
Exports	0.4 (0.4)	0.9 (1.2)	1.3 (1.4)	0.8 (0.9)
Imports	-2.3 (-2.2)	-1.6 (-1.4)	-0.7 (-1.6)	-0.9 (-1.0)
Subtotal: net exports	-1.9 (-1.8)	-0.7 (-0.2)	0.6 (-0.2)	-0.1 (-0.1)
Inventories	0.7 (0.7)	1.0 (0.9)	0.1 (0.3)	-0.1 (-0.3)
GDP	4.5 (4.6)	3.5 (4.2)	1.8 (3.2)	2.4 (2.2)
Memo items (percentage change):				
Range for potential output, including temporary factors‡	2.1–2.5 (2.1–2.5)	0.5–2.0 (1.3–2.3)	1.8–3.3 (2.9–3.9)	2.0–3.5 (2.3–2.9)
Real gross domestic income (GDI)	8.8 (8.8)	6.0 (5.9)	0.3 (2.2)	1.6 (1.5)
CPI inflation	3.4 (3.4)	7.2 (5.3)	4.6 (2.8)	2.3 (2.1)

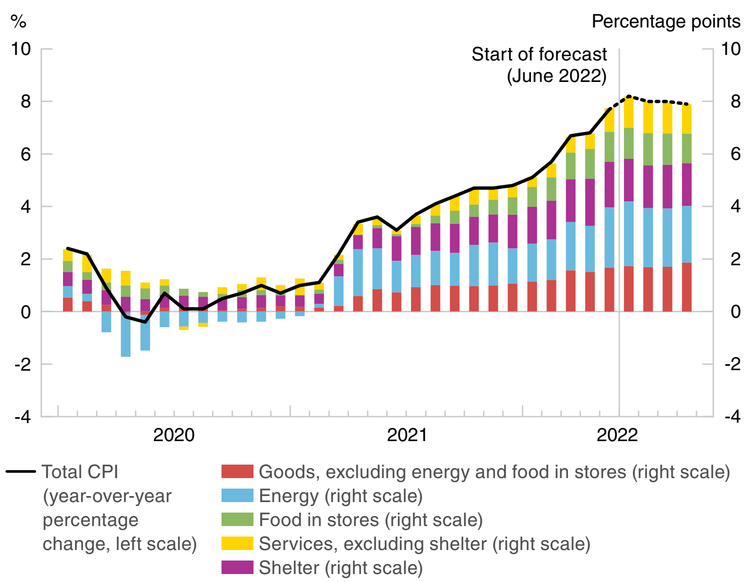
* Numbers in parentheses are from the projection in the previous Report.
† Numbers may not add to total due to rounding.
‡ See **Box 2** for details.
Sources: Statistics Canada and Bank of Canada calculations and projections

CPI inflation at a 40-year high

CPI inflation has continued to rise and is now expected to reach about 8% in the third quarter of 2022 (**Chart 4**). Global factors remain the largest drivers. These include Russia's invasion of Ukraine, which has further pushed up food and gasoline prices. As well, tradable goods prices, including high freight costs, continue to put pressure on global costs.

Chart 4: Shelter, food, energy and goods prices are pushing up inflation

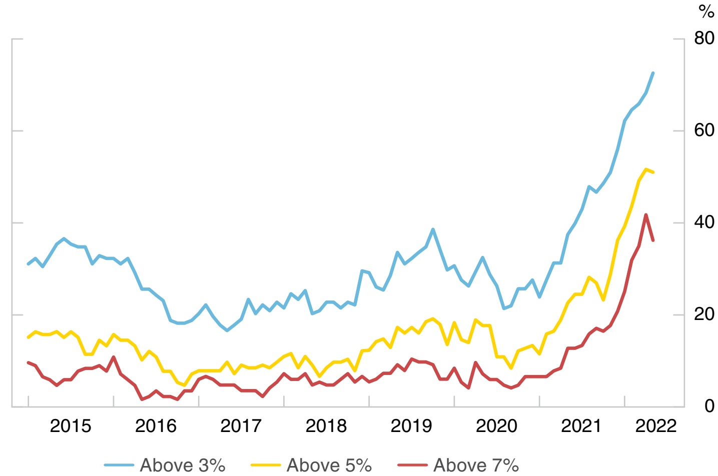
Contribution to CPI inflation, in percentage points, monthly data



Sources: Statistics Canada and Bank of Canada estimates and calculations Last data plotted: September 2022

Chart 5: Price pressures are broad-based

Share of CPI components growing above 3%, 5% and 7% on a year-over-year basis, monthly data



Sources: Statistics Canada and Bank of Canada calculations
Last observation: May 2022

Domestic demand conditions are also contributing to elevated inflation. The pandemic saw a profound shift in consumer preferences toward goods and low-contact services. In addition to the strength in goods prices, shelter prices, which include rent, have risen significantly over the past year. With the recent removal of health restrictions, prices for hard-to-distance services, such as traveller accommodations, have also been increasing.

Overall, demand remains robust. It has enabled many firms to raise prices—passing on to consumers higher costs, including the recent spike in energy prices. As a result, inflation has broadened, with almost three-quarters of CPI categories growing above 3% and more than half growing above 5% (**Chart 5**).

Measures of core inflation have increased further since the April Report. CPI-trim, CPI-median and CPI-common are at 5.4%, 4.9% and 3.9%, respectively. The rise in CPI-common—which puts more weight on services and domestic conditions—reflects growing excess demand in Canada.

Higher and more dispersed inflation expectations

Inflation expectations have a direct impact on inflation because they are factored in when firms set wages and prices. To assess inflation expectations, the Bank relies on various survey results and market-based information. Consumer and business surveys indicate that median inflation expectations over the next two years have increased (**Chart 6**). Inflation expectations of professional forecasters have also increased at the two-year horizon, albeit much more modestly than those of households and firms. Household and business surveys also show a wider distribution of inflation expectations among respondents. In particular, a large number of participants in the Business Outlook Survey (BOS) for the second quarter of 2022—considerably more than in previous surveys—now think that inflation will be at or well above 4% over the next two years (**Chart 7**).[1] These survey results suggest greater uncertainty about the future path of inflation, increasing the risk that inflation expectations become de-anchored.

1 As well, the Canadian Survey of Consumer Expectations shows that the distribution among household survey respondents has also widened. However, the increase in dispersion for households is less clear-cut than that of businesses.

Chart 6: Inflation expectations of consumers and firms have increased

Quarterly and weekly data

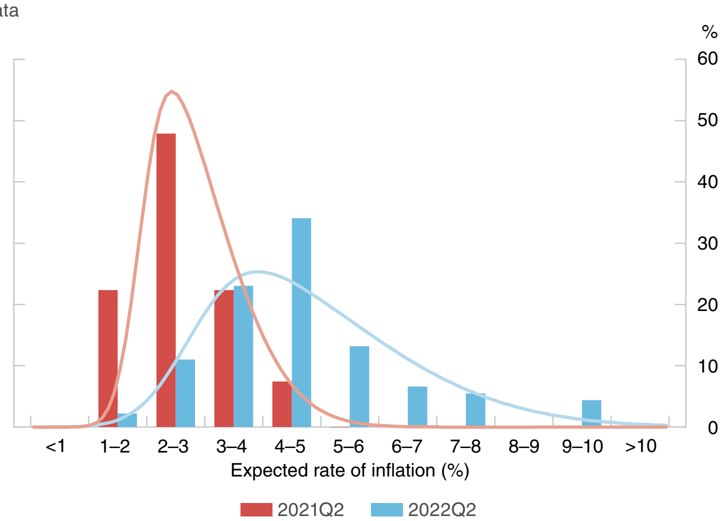
Note: CSCE is the Canadian Survey of Consumer Expectations; BOS is the Business Outlook Survey. The BOS 2-year estimate is based on firms' responses to the BOS question, "Over the next two years, what do you expect the annual rate of inflation to be, based on the consumer price index?" Firms can select from predetermined ranges and provide a point estimate. In cases where a firm selects a range only: if the range is closed, a midpoint is used; if the range is open-ended, the average expectation of other firms in that range is used. The 5-year Canadian break-even inflation rate is the difference between the yields of a nominal bond and a real return bond of the same maturity, both issued by the Government of Canada. The break-even inflation rate is a weekly average of daily data. Consensus Economics provides inflation forecasts for the next 5 years followed by an inflation forecast for the next 6 to 10 years. These forecasts are transformed into fixed-horizon forecasts (2-year, 5-year) by weighted average.

Sources: Bloomberg Finance L.P., Consensus Economics, Bank of Canada and Bank of Canada calculations

Last observations: Consensus Economics, April 2022; BOS and CSCE, 2022Q2; break-even inflation rate, July 8, 2022

Chart 7: The distribution of inflation expectations has widened and shifted higher

Share of firms from the Business Outlook Survey with 2-year inflation expectations in each range, quarterly data



Note: The BOS 2-year estimate is based on firms' responses to the BOS question, "Over the next two years, what do you expect the annual rate of inflation to be, based on the consumer price index?" Firms can select from predetermined ranges and provide a point estimate. In cases where a firm selects a range only: if the range is closed, a midpoint is used; if the range is open-ended, the average expectation of other firms in that range is used. Lines on the chart represent fitted skew-normal distributions of inflation expectations in each quarter.

Sources: Bank of Canada and Bank of Canada calculations

Last observation: 2022Q2

Survey participants continue to point to global factors as the primary reason for higher expected inflation. However, they increasingly mention domestic factors, such as strong demand and persistent labour shortages.

The surveys show that inflation expectations at longer horizons have increased but remain in line with their pre-pandemic levels. While BOS results indicate that businesses now think inflation will remain above 2% for longer, the majority of respondents still expect inflation to return to target within the next three years. Market-based measures of longer-term inflation expectations are also in line with the Bank's inflation target. The five-year break-even inflation rate has decreased recently to about 2¼%. At this level, it is consistent with a rise in inflation over the near term followed by a decline toward the 2% target.

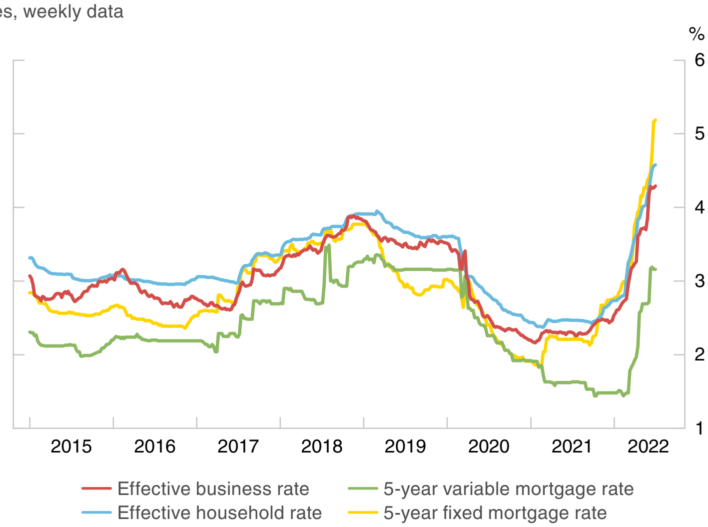
Tighter financial conditions

The Bank has tightened monetary policy in response to the strength of inflationary pressures, beginning to increase its policy rate in March and initiating quantitative tightening on April 25.[2]

Higher policy rates, market expectations of further rate increases, and quantitative tightening in Canada and elsewhere have contributed to rapid increases in borrowing costs for businesses and households (**Chart 8**). Households seeking to renew or take on a new mortgage now face five-year fixed mortgage rates at their highest level since 2010. According to the Canadian Survey of Consumer Expectations for the second quarter of 2022, consumers expect that accessing credit 12 months from now will be more difficult.

Chart 8: Borrowing rates for households and businesses have risen sharply

Interest rates, weekly data



Note: For more information on the effective household and business interest rates, see Interest Rate Statistics on the Bank of Canada's website.

Sources: Lender Spotlight and Bank of Canada

Last observations: effective business and household rates: July 8, 2022; 5-year fixed and 5-year variable rates: July 5, 2022

2 Under quantitative tightening, the Bank is shrinking its balance sheet by letting maturing bonds roll off. By July 8, the Bank's holdings of Government of Canada bonds had declined from around $425 billion at the time of the last Report to about $400 billion, and settlement balances had dropped from around $230 billion to about $175 billion during the same period. Quantitative tightening complements the increase in the policy rate by reducing the degree of monetary stimulus. This occurs in a predictable way because information about the Bank's holdings of maturing bonds is available to the public.

Slower growth in the third quarter

Following several robust quarters, economic growth is expected to slow from about 4% in the second quarter to about 2% in the third (**Table 3** and **Chart 9**). Consumption growth moderates as the boost from pent-up demand for in-person services eases. High inflation is also squeezing household budgets, and rising interest rates are increasing the cost to finance purchases of big-ticket items and making savings more attractive.

Table 3: Summary of the quarterly projection for Canada*

	2021	2022				2021	2022	2023	2024
	Q4	Q1	Q2	Q3		Q4	Q4	Q4	Q4
CPI inflation (year-over-year percentage change)	4.7 (4.7)	5.8 (5.6)	7.6 (5.8)	8.0		4.7 (4.7)	7.5 (4.5)	3.2 (2.4)	2.0 (2.1)
Real GDP (year-over-year percentage change)	3.2 (3.3)	2.9 (2.8)	4.7 (5.3)	3.9		3.2 (3.3)	2.6 (3.8)	1.8 (2.9)	2.7 (1.7)
Real GDP (quarter-over-quarter percentage change at annual rates)†	6.6 (6.7)	3.1 (3.0)	4.0 (6.0)	2.0					

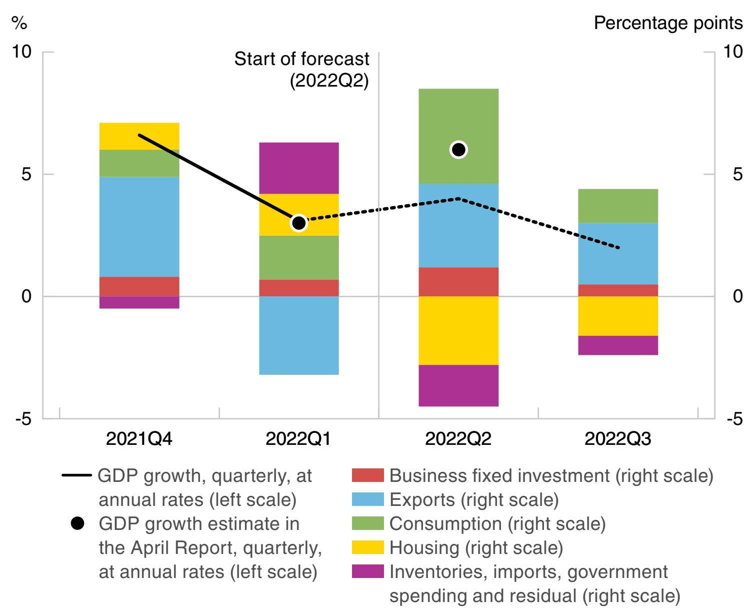
* Details on the key inputs to the base-case projection are provided in **Box 2**. Numbers in parentheses are from the projection in the previous Report.

† Over the projection horizon, 2022Q2 and 2022Q3 are the only quarters for which some information about real GDP growth was available at the time the projection was conducted. For longer horizons, fourth-quarter-over-fourth-quarter percentage changes are presented. They show the Bank's projected growth rates of CPI and real GDP within a given year. As such, they can differ from the growth rates of annual averages shown in **Table 2**.

Sources: Statistics Canada and Bank of Canada calculations and projections

Chart 9: Growth is expected to slow in the third quarter

Contribution to real GDP growth, quarterly data



Sources: Statistics Canada and Bank of Canada estimates and calculations
Last data plotted: 2022Q3

Chart 10: Housing market activity is slowing substantially

Seasonally adjusted, monthly data

Note: Residential resales are seasonally adjusted at annual rates.

Source: Canadian Real Estate Association

Last observation: May 2022

Housing market activity is weakening substantially from its unsustainable pace during the pandemic (**Chart 10**). Resales are falling across most regions and prices are declining in some markets as borrowing rates rise and household confidence declines. Some areas outside downtown cores, which had previously seen large price increases, are now experiencing a decline in prices.[3]

Exports and business investment continue to grow strongly, with the latter expected to reach pre-pandemic levels in the third quarter. Recent strength in US industrial production and an easing of travel restrictions should provide support for exports over the near term. As well, elevated energy prices are boosting exports and investment in the energy sector as firms seek to make full use of existing production capacity. Near-term business investment is also supported by a ramping up of work at LNG Canada's Kitimat site and continued work modernizing electric vehicle manufacturing.

Canadian economy in excess demand

A broad set of measures indicates that the economy is operating beyond its productive capacity.

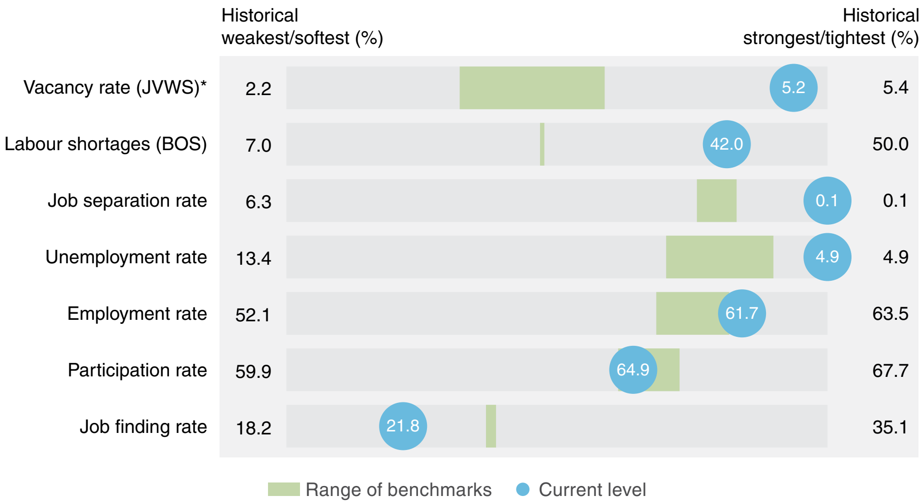
The labour market is tight along all dimensions.[4] Most indicators suggest the labour market has surpassed maximum sustainable employment (**Chart 11**), including the unemployment rate, which is at a series low. In turn, labour shortages are pushing wages higher. In the BOS for the second quarter of 2022, a near-record number of firms see labour shortages as more intense than they were a year ago. The ratios of vacancies and job postings to

3 The move to remote work in many sectors of the economy, combined with a desire for more living space, likely encouraged many households to seek properties away from downtown areas. For more details, see L. Morel, "Analyzing the house price boom in the suburbs of Canada's major cities during the pandemic," Bank of Canada Staff Analytical Note No. 2022-7 (June 2022).

4 For a detailed discussion of ways to assess labour market conditions, see E. Ens, C. Luu, K. G. See and S. L. Wee, "Benchmarks for assessing labour market health," Bank of Canada Staff Analytical Note No. 2022-2 (April 2022).

Chart 11: The labour market is tight

Selected labour market measures compared with their historical strongest/tightest and historical weakest/softest



* *Vacancy rate* data are from 2015 onward and may affect trend estimates.

Note: BOS is the Business Outlook Survey. JVWS is the Job Vacancy and Wage Survey. Included in the chart are ranges of values, represented by green bars, intended to benchmark labour market health. Measures above (below) their respective ranges would be consistent with a labour market operating above (below) what would be expected based on historical performance, indicative of labour market strength (weakness). Benchmark ranges are based on data up until February 2022 (2022Q1) for monthly (quarterly) data. The values reported for each variable's historical strongest/tightest and weakest/softest are based on data from 2003 or earliest data available after 2003, up until the latest observation. For details on the benchmarks included, see E. Ens, C. Luu, K. G. See and S. L. Wee, "Benchmarks for assessing labour market health," Bank of Canada Staff Analytical Note No. 2022-2 (April 2022). Data for all series are from Statistics Canada's Labour Force Survey (LFS) unless otherwise noted. LFS data are seasonally adjusted.

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

Last observations: LFS, June 2022; BOS, 2022Q2; JVWS, 2022Q1

unemployed workers have also risen to record levels. As a result of this tightness, wage growth is strengthening and broadening across sectors (**Chart 12**).

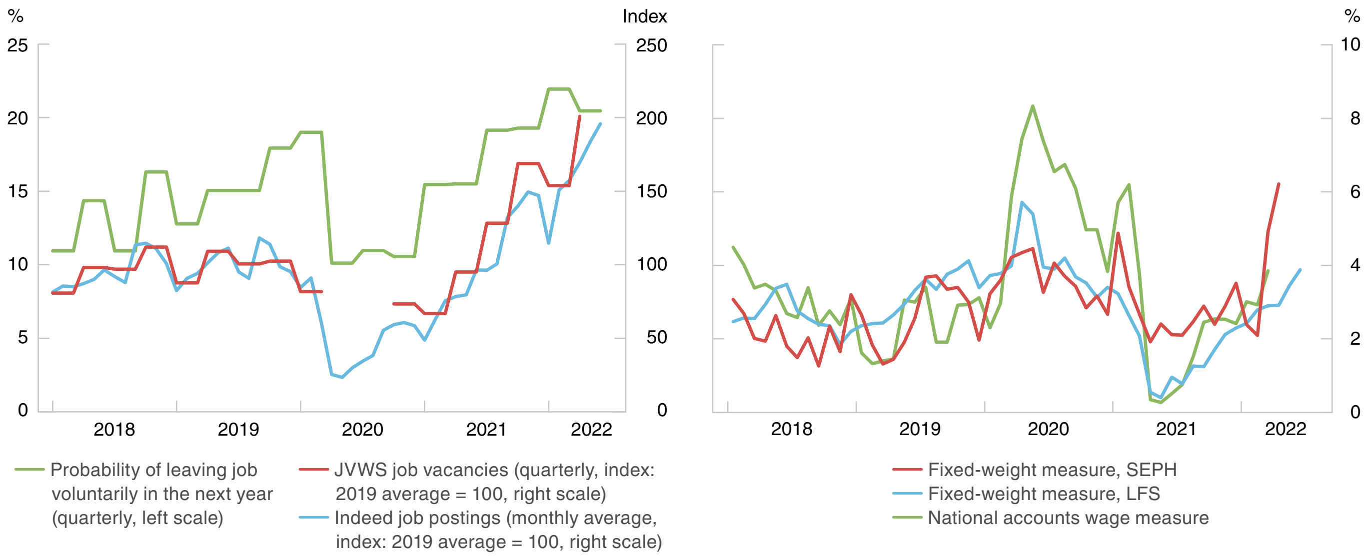
Businesses continue to report capacity constraints, including labour shortages and supply chain challenges (**Chart 13**). Supply constraints are still weighing on production and sales. This is particularly acute in the auto sector, where it continues to be difficult to source semiconductors and get motor vehicles to retailers.

The Bank estimates that the output gap—the difference between GDP and supply—has risen further into positive territory in the second quarter of 2022, to between 0.5% and 1.5%. This is up from the estimate of -0.25% to 0.75% for the first quarter (**Box 2**). With economic growth anticipated to be roughly in line with supply growth in the third quarter, the economy remains in excess demand.

Chart 12: Labour shortages are pushing up wage growth

a. Responses to the CSCE;* ratios of JWVS job vacancies and Indeed online job postings to unemployment, not seasonally adjusted

b. Wage growth measures, year-over-year percentage change, monthly data



* Respondents to the Canadian Survey of Consumer Expectations (CSCE) were asked, "What do you think is the percent chance that you will leave your job voluntarily during the next 12 months?" The chart presents the median response.

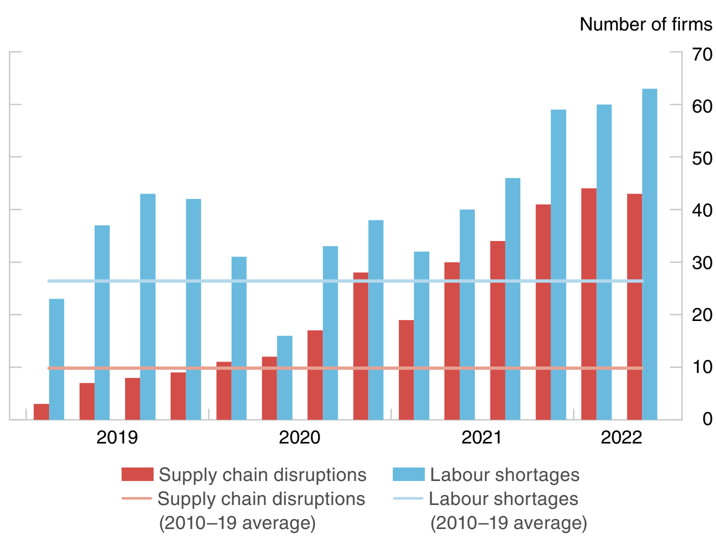
Note: JVWS is the Job Vacancy and Wage Survey; LFS is the Labour Force Survey; SEPH is the Survey of Employment, Payrolls and Hours. Quarterly JVWS job vacancies data have been extended to April 2022 based on Statistics Canada's preliminary monthly estimate. Due to data limitations at the onset of the pandemic, JVWS job vacancies data are unavailable for the middle quarters of 2020. The LFS fixed-weight measure is constructed using 2019 employment weights for wages based on employees' job status (full or part time), job permanency (permanent or temporary), industry of employment and occupation. The national accounts wage measure is constructed as total wages and salaries at a monthly frequency from the Canadian System of Macroeconomic Accounts divided by total hours worked from SEPH.

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

Last observations: CSCE, 2022Q2; national accounts wage measure, March 2022; JVWS and SEPH, April 2022; Indeed and LFS, June 2022

Chart 13: Businesses continue to report elevated capacity constraints

Number of firms reporting bottlenecks, Business Outlook Survey, quarterly data



Note: The Business Outlook Survey (BOS) samples about 100 firms. Firms were asked the question, "What would be the most important obstacles or bottlenecks to being able to meet an unexpected increase in demand?" Mentions of a fully utilized labour force and an inability to find suitable new labour at the current wages are counted as labour shortages. Mentions of raw material constraints, transportation difficulties and logistics bottlenecks are counted as supply chain disruptions.

Source: Bank of Canada

Last observation: 2022Q2

Slower demand coupled with pickup in supply

The Canadian economy is anticipated to grow by about 3½% over 2022, boosted by pent-up domestic demand. Growth then slows to about 1¾% in 2023 in response to higher interest rates, lower commodity prices and declining foreign demand. Economic growth reaches 2½% in 2024 as household spending improves.

Supply growth is forecast to rebound from about ¾% in 2022 to about 2¾% on average over 2023–24. It strengthens over the projection horizon as global transportation bottlenecks and shortages of critical inputs ease. The easing of supply constraints, together with robust business investment, drives a rebound in productivity from its recent lows. Meanwhile, higher immigration will boost labour supply.

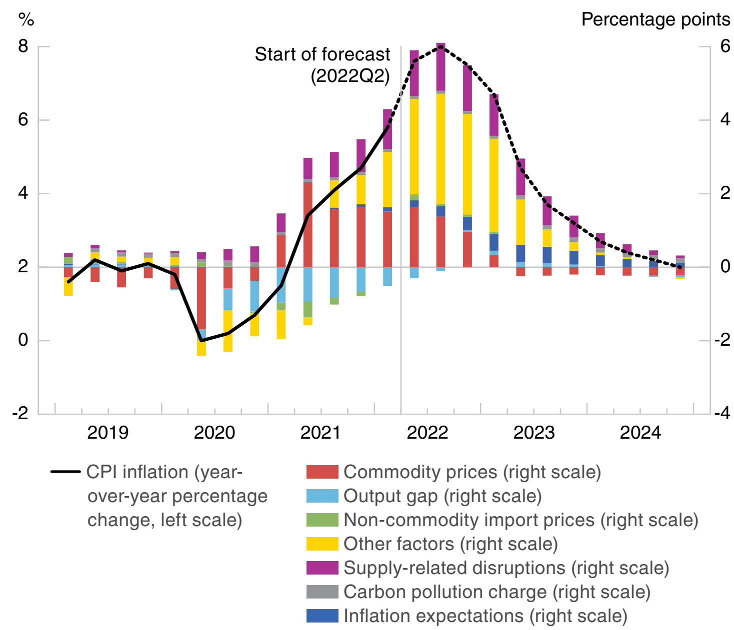
Excess demand in the Canadian economy eases over the projection horizon as demand moderates and supply strengthens. The output gap is expected to close in 2023 and move into modest excess supply in 2024.

Inflation lower in late 2022 and at target by the end of 2024

Inflation is expected to decline over the projection horizon (**Chart 14** and **Chart 15**). Inflation falls from about 8% in the third quarter of 2022 to roughly 3% by the end of 2023. A decline in oil prices and lower house prices pull down quarter-over-quarter inflation in the second half of 2022. This helps lay the foundation for the decline in inflation. Inflation returns to the 2% target by the end of 2024 as global price pressures and domestic demand ease.

Chart 14: CPI inflation is forecast to slow as the effects of high commodity prices and other global cost pressures ease

Contribution to the deviation of year-over-year inflation from 2%, quarterly data

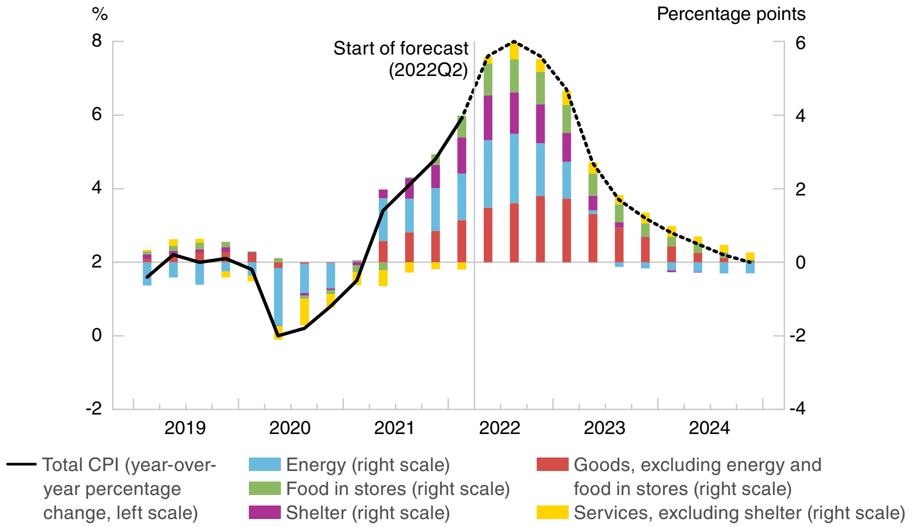


Note: *Supply-related disruptions* are estimated using the Federal Reserve Bank of New York's Global Supply Chain Pressure Index. *Inflation expectations* are estimated using a dynamic factor model that covers several indicators of inflation expectations across households, firms, professional forecasters and market-based sources. *Other factors* include previously underestimated demand pressures, such as from large imbalances in the housing market that have significantly raised shelter costs, changes to the production network (e.g., reshoring) and greater pass-through from oil or import prices. *Non-commodity import prices* include the impact of the Can$/US$ exchange rate. Numbers may not add to total due to rounding.

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

Chart 15: CPI inflation is projected to start easing in late 2022 as energy prices decline

Contribution to the deviation of year-over-year inflation from 2%, quarterly data



Note: Contributions are forecast using historical relationships between CPI components and macroeconomic variables in the base-case projection. Numbers may not add to total due to rounding.

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

Inflation is forecast to ease, reflecting several forces. Oil prices are projected to fall gradually, with the Brent price back down to $100 by the end of 2024. Global supply bottlenecks abate, and the tightening of monetary policy abroad weighs on foreign demand. Consequently, inflation of tradable goods prices declines.

Higher interest rates in Canada will soften demand, reducing domestic inflationary pressures. Inflation of services prices, including shelter price inflation, eases. Considerable uncertainty continues to surround this outlook, as has been the case throughout the pandemic (see the **Appendix** on page 26).

Sizable pullback in housing activity

The contraction in housing activity is expected to continue in the second half of 2022 and into 2023. Resales and house prices decline as borrowing rates rise and the pandemic-induced boost in demand wanes. Residential construction, including renovations, is also predicted to drop over the next year. Housing activity and prices are forecast to stabilize later in the projection horizon as both population and income growth boost housing demand.

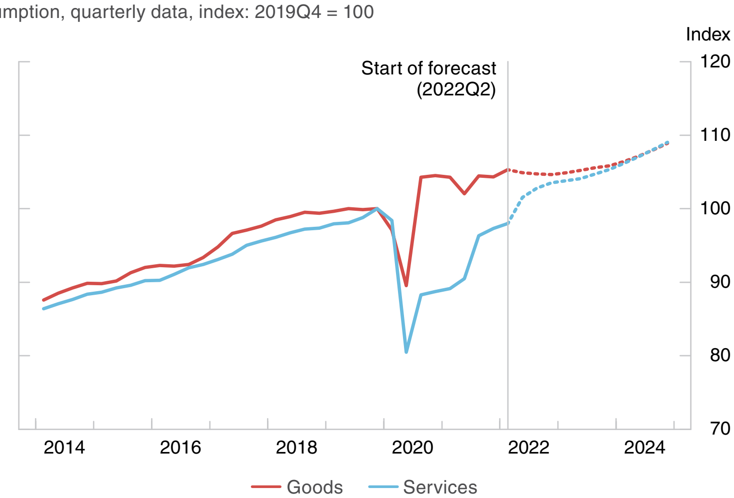
Softer consumption growth

Consumption grows at a modest pace over the projection horizon. Spending on travel and other hard-to-distance services rises as consumers become less concerned about physical distancing. This will contribute to a rebalancing of the consumption of goods and services (**Chart 16**). A drawdown in some of the savings accumulated during the pandemic also supports household spending.[5] For example, motor vehicle purchases are expected to pick up as supply shortages resolve and pent-up demand is met.

However, consumption growth is anticipated to slow from its current strong pace. High inflation means that households will allocate more of their disposable income to necessities such as food and gasoline, leaving them with less money to spend on other items. And higher interest rates mean that some households will postpone major purchases, pay down debt or save more.[6] As well, some households—particularly those that took on a sizable mortgage when rates were lower—will face significantly larger payments when they renew their mortgages. The slowdown in housing activity will also weigh on the consumption of goods such as furniture and appliances.

Chart 16: Consumption is rebalancing toward services

Real consumption, quarterly data, index: 2019Q4 = 100



Sources: Statistics Canada and Bank of Canada calculations and projections

Moderate export growth

Export growth is expected to remain strong throughout the remainder of 2022, boosted by elevated commodity prices and a pickup in international travel. Later in the projection horizon, export growth slows as foreign demand declines (**Chart 17**).

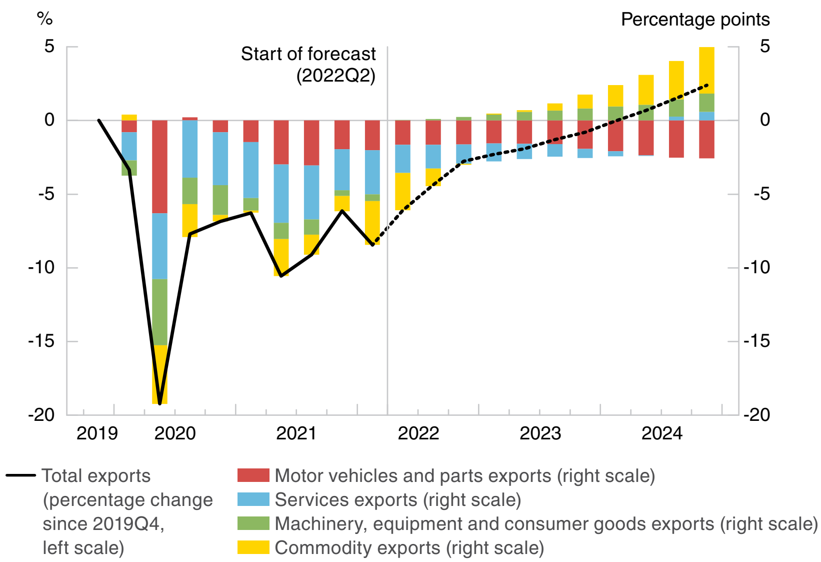
Non-energy exports should grow solidly as global supply disruptions dissipate. However, exports of motor vehicles will slow growth in the second half of 2023 and in 2024 when some manufacturing facilities close temporarily to retool for the production of electric vehicles. Exports and imports of services strengthen and reach pre-pandemic levels in 2024 while international travel continues to recover.

5 However, consumers are incentivized to save more than previously expected given increased uncertainty and higher interest rates offering better returns.

6 These assessments are consistent with results from the *Canadian Survey of Consumer Expectations—Second Quarter 2022*.

Chart 17: Elevated commodity prices and easing supply disruptions support the recovery in exports

Contribution to the deviation of real total exports from the 2019Q4 level, in percentage points, quarterly data



Sources: Statistics Canada and Bank of Canada calculations and projections

Energy exports are projected to grow strongly due to high prices and increased transportation capacity. Expected expansions in pipeline capacity—including the Trans Mountain Expansion project—and in volumes of crude-by-rail will support growth later in the projection horizon.

Imports are anticipated to remain solid, backed by robust business investment, ongoing restocking by businesses, and firms' desire to hold more inventory to buffer themselves against future supply disruptions.

Robust business investment

Outside the oil and gas sector, the investment outlook is bolstered by solid demand, robust business confidence and a push to alleviate capacity constraints (**Chart 18**). This outlook is consistent with the results of the BOS, with firms planning investments in digital technologies to improve productivity given tight labour markets and high input costs.

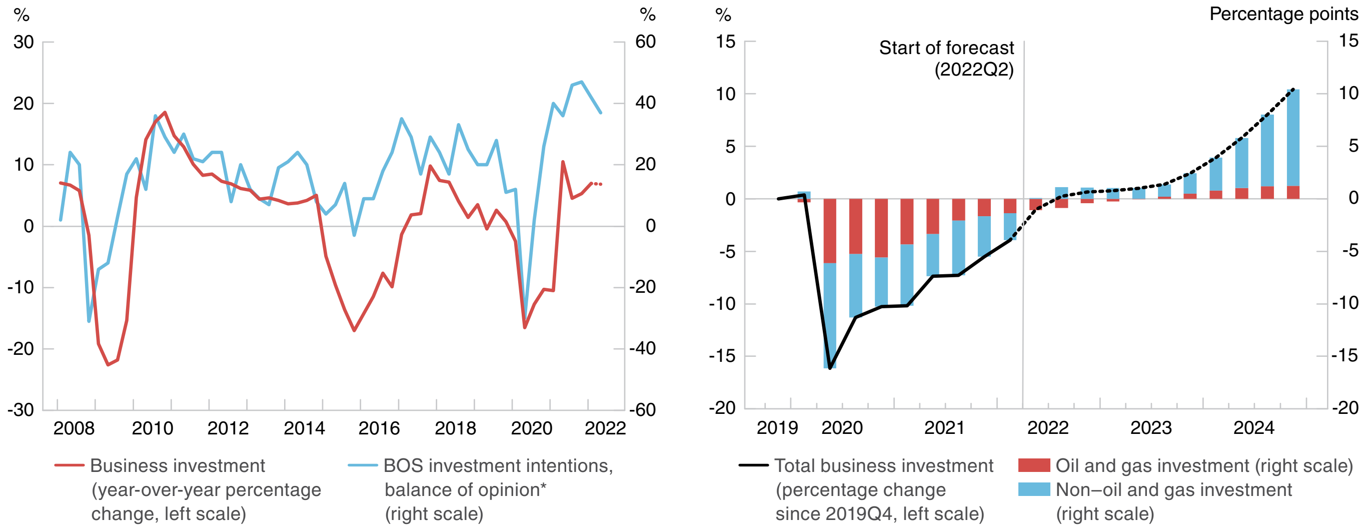
Investment growth in the oil and gas sector is anticipated to be robust, though more muted than during past periods of high prices. Producers of conventional oil and natural gas are expected to focus on expanding production capacity in fields where infrastructure is readily available. Investment in the oil sands is expected to be limited to improving the use of existing capacity and expanding current projects. Oil sands projects tend to require more capital and emit higher levels of greenhouse gases, making them sensitive to uncertainty about long-term demand and the transition to a low-carbon economy.

Chart 18: Business investment is expected to grow strongly

Quarterly data

a. Business investment and BOS investment intentions for machinery and equipment

b. Contribution to the deviation of real total business investment from the 2019Q4 level, in percentage points



* Percentage of respondents to the Business Outlook Survey (BOS) that expect higher investment spending on machinery and equipment over the next 12 months minus the percentage that expect lower investment spending.

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

Last observation: BOS, 2022Q2
Last data plotted in panel a: business investment, 2022Q2

Risks to the inflation outlook

The global economy faces many challenges. The pace of monetary policy tightening has accelerated in many countries as inflationary pressures have continued to rise and broaden. These pressures are contributing to greater volatility in financial markets and growing concerns about the path for the global recovery. Also, even as disruptions related to the COVID-19 pandemic have continued to ease, Russia's invasion of Ukraine remains a major source of uncertainty.

Some of the risks identified in previous reports have been partially incorporated into the projection. The base-case scenario includes more persistent supply challenges, greater pass-through of cost increases, tighter global financial conditions and the impact of higher inflation expectations.

The Bank sees two main risks to the outlook for inflation. On the upside, if left unchecked, persistently high inflation could result in a wage-price spiral. On the downside, the slowdown in the global economy could be more severe than expected, especially if the US economy slows more than expected.

Drawing from a larger set of risks, this section discusses other risks that may affect the projected path of inflation. The upside risks are of greater concern because inflation is persistently high, and evidence is mounting that expectations of inflation are drifting upward.

(i) Main upside risk: Higher inflation becomes entrenched (↑)

Until inflation drops significantly, the risk is greater that Canadians will believe it will stay high over the long term. Higher inflation expectations could lead to more pervasive increases in prices and labour costs, and these in turn could become embedded in higher inflation. **Box 3** provides a scenario of what could happen if longer-term inflation expectations become de-anchored and a wage-price spiral takes hold. In this case, mutually reinforcing wage and price pressures would amplify high inflation, and a greater degree of monetary policy tightening and a more pronounced slowdown of the economy would be needed to bring inflation back to target.

(ii) Main downside risk: More severe global slowdown (↓)

The global economy could slow more than anticipated. The euro area is at risk of recession as energy shortages lead to even higher prices, undermining consumer demand. Economy-wide disruptions could occur if rationing is implemented. At the same time, the impact of tighter financial conditions on household confidence and spending could be greater than expected. This could lead to slower growth in many regions. If more forceful actions are required to restrain inflation in the United States, US growth could slow more than projected. As well, lockdowns in China could be more frequent and have a larger negative impact on growth than currently assumed. These shocks would be transmitted to the Canadian economy through weaker foreign demand, lower commodity prices and a deterioration in the terms of trade.

Other risks

(iii) Stronger household spending in Canada (↑)

In the base-case scenario, consumption grows at a modest pace and housing activity sees a sizable pullback. For many households, higher inflation and interest rates are squeezing budgets. However, a considerable proportion of households have accumulated large excess savings and are therefore more capable of absorbing higher prices. With the reopening of the economy, the boost from pent-up demand could be more sustained than anticipated if this group spends even more of its accumulated savings. Consumption and residential investment would then be stronger than projected and would contribute to greater inflationary pressures.

(iv) Reversal of increases in goods prices (↓)

The base-case scenario assumes that the spike in goods prices since the beginning of the pandemic will persist. However, these prices could decline as supply chain bottlenecks dissipate and demand moderates. Oil prices and transportation costs could decrease more sharply than expected or growth in goods consumption could slow more than projected, particularly in the United States. If either of these scenarios occurs, inflation would be lower than projected.

Some large global retailers are reporting high levels of inventory after building up their stocks to avoid shortages. This could suggest some downside risk if retailers offer deep discounts to clear excess inventory.

(v) Sharper decline in housing activity and consumption in Canada (↓)

While the base case projects a significant decline in housing activity, a steep drop in homebuyer sentiment could amplify the decline in house prices. Significant drops in house prices would reduce household wealth and access to credit as well as undermine consumer confidence. This would weigh on demand, especially from highly indebted households that have taken out sizable mortgages to purchase a home. Higher borrowing rates and reduced access to credit could also have larger-than-expected dampening effects on household spending, business investment and employment.

Box 3

Scenario with a wage-price spiral

With inflation high and broadening, inflation expectations have moved upward. These rising inflation expectations are occurring while the labour market is tight and wage growth is strong. This increases the risk that a self-reinforcing wage-price spiral could ensue—a key upside risk to the inflation outlook.

In this risk scenario, when inflation remains persistently high, more households and firms base their inflation expectations only on the most recent inflation data. As a result, longer-term inflation expectations become de-anchored and stay above the target.[1]

De-anchored inflation expectations lead firms to set prices even higher. Similarly, in response to higher expected inflation, workers bargain for persistently higher wage growth to protect against anticipated losses in purchasing power. The resulting stronger wage growth feeds into production costs and prompts firms to raise prices even further. This process boosts inflation expectations, perpetuating the spiral.

The longer inflation remains well above target, the more likely it is that a wage-price spiral will occur. This likelihood also increases if firms have multi-year wage agreements in place with high wage increases in every year.

1 This contrasts with the base case, which has long-run inflation expectations remaining well anchored to the inflation target.

Increased risk of recession

This risk scenario examines what could happen if a wage-price spiral occurred. The spiral prompts inflation expectations, wages and prices to ratchet upward. With de-anchored expectations, inflation stays higher than it would have been with easing demand and flat or declining commodity prices.

To break the vicious circle, monetary policy works to re-anchor long-term inflation expectations to the 2% target. This is done by setting monetary policy much tighter than in the base case and creating additional excess supply.

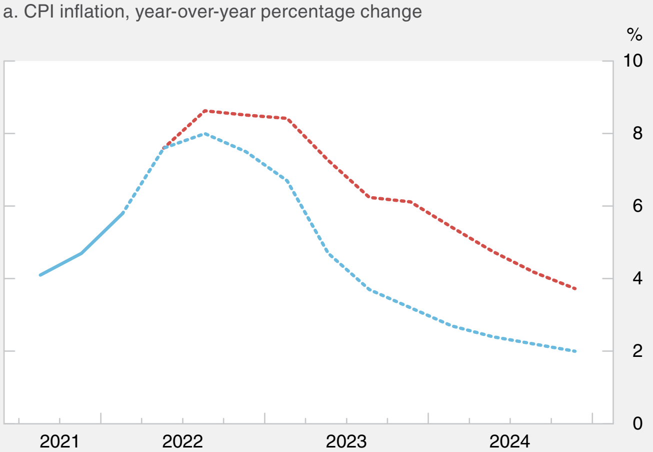
Chart 3-A (panel a) shows that, in this illustrative risk scenario, overall inflation peaks at 8.6%, higher than in the base case. By the end of 2023, inflation is at 6%, about 3 percentage points higher than in the base case. Growth of real gross domestic product is significantly weaker, reaching a trough of about -2.5%, and Canada experiences a four-quarter recession (**Chart 3-A**, panel b).

The Bank of Canada is keenly aware of the possibility of a wage-price spiral and is firmly committed to ensuring that this dynamic does not set in. This requires setting monetary policy much tighter than in the base case to ensure that long-run inflation expectations remain well anchored. With inflation expectations firmly anchored to the inflation target, the likelihood of a wage-price spiral is greatly diminished.

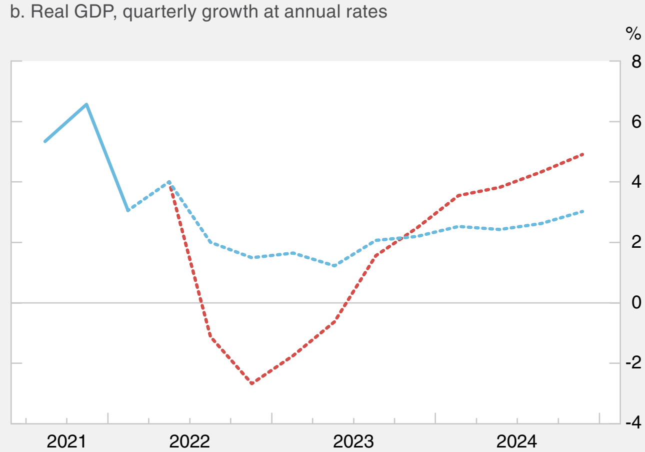
Chart 3-A: In the wage-price spiral scenario, inflation is higher and growth is slower

Quarterly data

a. CPI inflation, year-over-year percentage change



b. Real GDP, quarterly growth at annual rates



Base-case projection — Wage-price spiral scenario

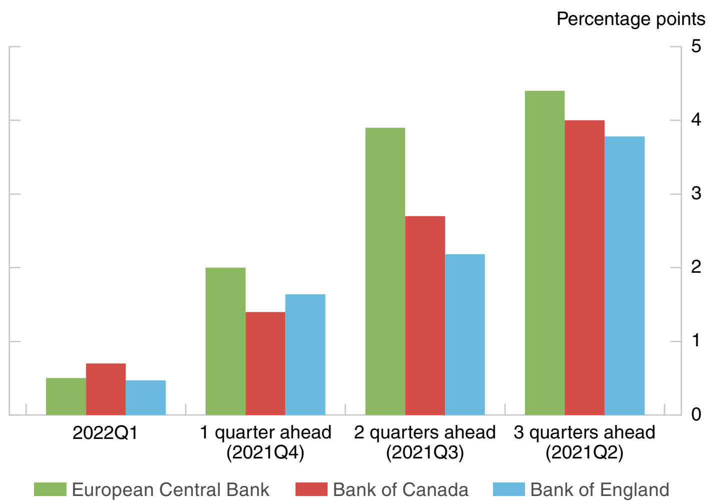
Sources: Bank of Canada and Bank of Canada calculations and projections

Appendix: Main factors behind inflation forecast errors

The Bank of Canada, like other central banks, has underpredicted inflation since spring 2021 (**Chart A-1**). Precisely quantifying the sources of inflation forecast errors is complex because many factors influence inflation at the same time, making it difficult to fully disentangle them. That said, global factors appear to explain about two-thirds of missed inflation through higher commodity prices, increased supply shortages and rising shipping costs (**Chart A-2**). The faster-than-expected recovery in the Canadian economy added to the Bank's forecast errors but cannot explain most of the surprise: about one-quarter of the miss on inflation is explained by domestic factors, mostly housing costs.

Chart A-1: Central banks have underpredicted inflationary pressures

Year-over-year inflation projection errors for 2022Q1 for three central banks, quarterly data



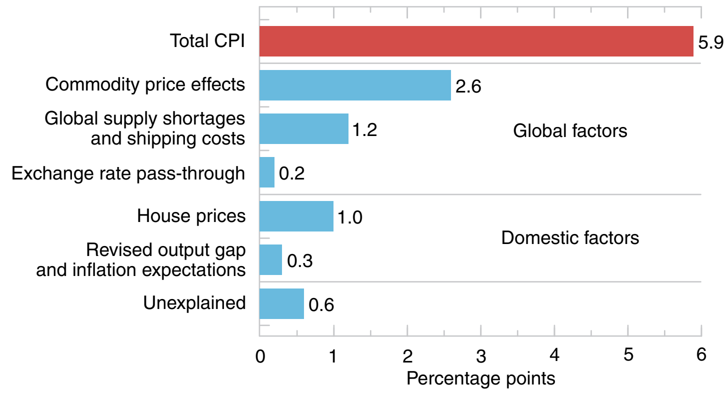
Note: The horizontal axis refers to the quarters when the forecasts were made for 2022Q1 inflation. Projection errors are the difference between the actual observed value and the projection value. This chart was inspired by Box 5 in the ECB Economic Bulletin, Issue 3/2022.

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

Last observation: 2022Q1

Chart A-2: Commodity prices and supply shortages were the largest sources of error in Canada

Year-over-year inflation projection errors for 2022Q2, quarterly data



Note: The projection error is the difference between the actual observed value for 2022Q2 (using the Bank of Canada's assumption for June 2022) and the projected value in the April 2021 Report. *Commodity price effects* include direct impacts and unexpected pass-through of higher energy prices to other consumer prices. *House prices* refer to the direct impact of house prices through homeowners' replacement costs and other owned accomodation expenses.

Sources: Statistics Canada and Bank of Canada estimates and calculations Last observation: 2022Q2

Global shocks behind most errors

Higher-than-expected commodity prices

The Bank typically uses a flat assumption about oil prices over its two- to three-year projection horizon. This assumption is based on work by Alquist et al. (2013), which shows that this approach was providing more accurate forecasts than other methods.[7]

Since 2020, however, the flat assumption has consistently underpredicted oil prices (**Chart A-3**). Commodity price effects alone account for over 40% of the Bank's total underprediction of inflation. Refinery margins recently deviated unexpectedly from their historical levels, leading to higher gasoline prices. And the Russian invasion of Ukraine has driven prices for oil and natural gas even higher.

In the past, a strong correlation existed between oil prices and the Canadian dollar: as oil prices rose, the dollar appreciated. This helped offset the inflationary impact of higher energy prices by making imports into Canada cheaper. But recently, this relationship has not held, which means that higher oil prices have had an even greater effect on inflation.[8]

In addition, other commodity prices have been unexpectedly high. For example, agricultural commodity prices have surged since 2021, largely due to unpredictable severe weather events. And the war in Ukraine has spiked wheat prices in particular.

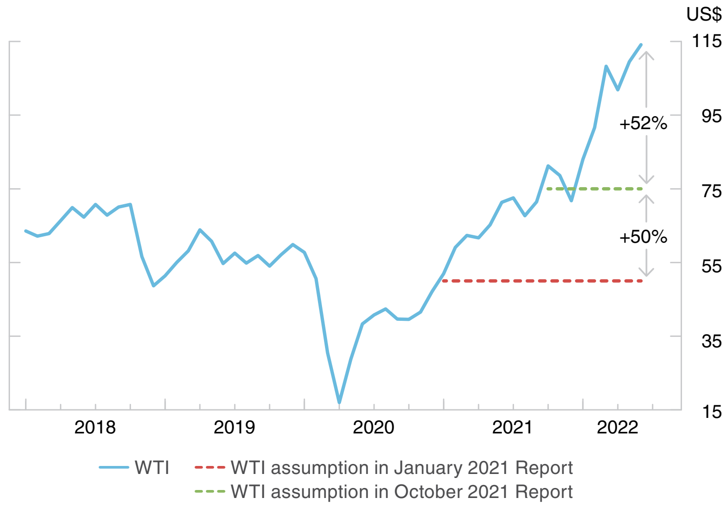
As well, higher energy prices affected shipping costs, contributing to the steep rise in the price of goods globally.

7 See R. Alquist, L. Kilian and R. J. Vigfusson, "Forecasting the Price of Oil," in Handbook of Economic Forecasting, 2A, edited by G. Elliott and A. Timmermann (Amsterdam: North-Holland, 2013): 427–507. In recent reports, the Bank has deviated from the flat assumption about oil prices given the high volatility of oil prices due to the war in Ukraine.

8 This relationship may have broken down in part because of uncertainty about demand for oil and natural gas in the long term. See T. Gravelle, "The perfect storm" (speech to the Association des économistes québécois, Montréal, Quebec, May 12, 2022).

Chart A-3: Oil prices are much higher than expected a year ago

West Texas Intermediate (WTI) price per barrel, monthly data



Sources: NYMEX via Haver Analytics and Bank of Canada calculations and projections

Last observation: June 2022

Stronger-than-anticipated tradable goods prices

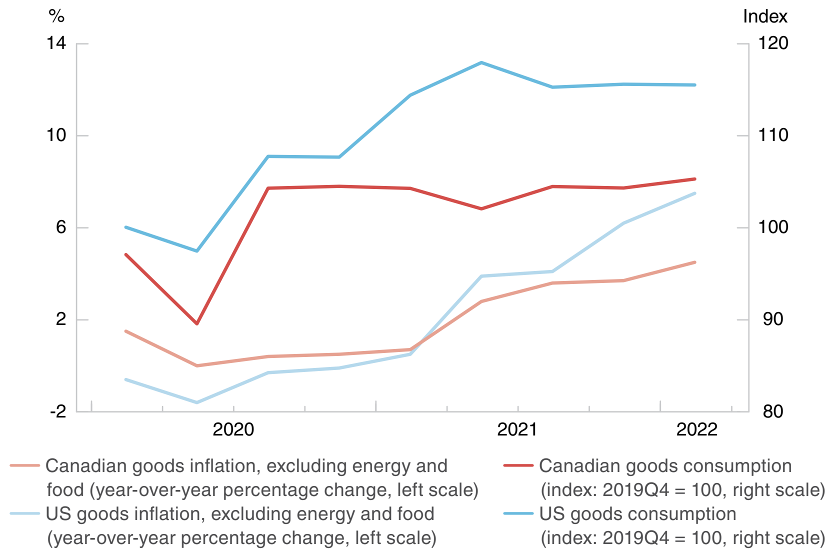
Instead of weakening as in past downturns, US consumer demand for goods unexpectedly surged well beyond pre-pandemic levels (**Chart A-4**).[9] Supported by fiscal policy measures, US household incomes turned out to be higher than anticipated. As well, the extent to which households shifted their spending into low-contact sectors was unexpected. Overall, strong foreign demand for tradable goods, such as appliances and furniture, has pushed up prices globally, including for Canadian consumers.

At the same time, the pandemic led to factory and port shutdowns around the world, upending supply chains for goods. The Bank had expected supply chains to be restored quickly once initial lockdown measures were lifted. However, further waves of the virus have caused continued disruptions, both globally and in Canada. In addition, the impact of supply challenges on consumer prices has been greater than anticipated. All told, roughly 20% of the forecast errors are related to global supply chain pressures.

9 Because the US economy is roughly 10 times larger than the Canadian economy, the impact of strong US demand on goods inventory is much larger than would have been the case if Canadian demand had rebounded by as much.

Chart A-4: US goods consumption surged, boosting tradable goods prices

Quarterly data



Note: Goods inflation excluding food and energy is calculated based on CPI inflation for Canada and the personal consumption expenditure price index for the United States. Inflation components included and their definitions may differ slightly between the countries.

Sources: Statistics Canada, US Bureau of Economic Analysis and Bank of Canada calculations

Last observation: 2022Q1

Faster-than-expected recovery in Canada

The fiscal and monetary policy response to the pandemic had stronger effects than initially anticipated.[10] Instead of declining, household disposable incomes and consumer confidence rose. The inability to spend on in-person services also meant that savings soared for some households. These factors contributed to more robust demand for goods than anticipated.

The large accumulation of savings, low mortgage rates and changes in homebuyer preferences led to house prices growing by more than had been expected given the amount of slack in the economy. The sharp rise in house prices has boosted consumer price index inflation by 1.2 percentage points on average since the middle of 2021.

The early arrival of vaccines in spring 2021 sped up the economic recovery. This was evident in the labour market because people were able to return to work faster than anticipated.

In 2022, with the lifting of most public health restrictions, consumer cautiousness faded more quickly than in past downturns, and pent-up demand led to robust consumption growth. With the economy already in excess demand, the effects of domestic demand on inflation became more important. These effects are contributing to a broadening of high inflation into non-shelter services such as traveller accommodation and transportation.

Overall, commodity prices are the largest factor, explaining about 45% of the forecast errors over the past year. Global supply shortages and shipping costs as well as domestic factors are also important, each contributing over 20%. That said, it is important to note that these are rough estimates that will evolve over time.

10 See Bank of Canada, *Monetary Policy Report* (April 2020).