Monetary Policy Framework
Renewal

December 2021

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Chapter 1: Introduction

Building on success

Every five years, the Bank of Canada and the Government of Canada review and renew the agreement on Canada's monetary policy framework. In 2021, the country's flexible inflation-targeting framework was renewed for another five-year period, ending on December 31, 2026.

The Government and the Bank believe that the best contribution of monetary policy to the well-being of Canadians is to continue to focus on price stability. The Government and the Bank also agree 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 agree 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.

Under this agreement, the Bank will continue to conduct monetary policy aimed at keeping inflation—as measured by the 12-month rate of change in the consumer price index—at 2 percent, with an inflation-control range of 1 to 3 percent.

This agreement also articulates how the Bank can continue to use the flexibility in its framework to manage the challenges of lower neutral interest rates globally and uncertainty about maximum sustainable employment. As such, it provides continuity and clarity and strengthens the framework to reflect the realities of the world we live in.

Flexible inflation targeting has delivered low, stable and predictable inflation since it began in 1991. This has contributed to a more stable environment in which households and firms can make spending and investment decisions. It has also contributed to sustained growth in output, employment and

productivity and has improved Canadians' standard of living. The 2021 reopening of the global economy has been associated with elevated inflation in Canada and abroad. While this is a global phenomenon, it makes maintaining a sound framework for monetary policy in Canada all the more important.

Every time the agreement is renewed, the Bank carefully reassesses whether the existing monetary policy framework is the best contribution that the Bank can make to promoting Canada's economic and financial welfare.

The 2008–09 global financial crisis and the COVID-19 pandemic have had a significant impact on the global economy and financial system, and major trends such as shifting demographics and new digital technologies are altering the economic landscape. Climate change and the long-term transition to net-zero greenhouse gas emissions will drive structural change in the Canadian and global economies. Also, there is now greater recognition, supported by economic research, that when the benefits of economic growth and opportunity are more evenly shared, it leads to more prosperity for the whole economy.[1] A strong and inclusive labour market helps reduce income inequality and supports robust demand for goods and services.

Leveraging the flexibility of the framework

These trends emphasize the importance of the flexibility inherent in Canada's monetary policy framework. Two of them are particularly relevant:

- **Neutral interest rates around the world—which ensure that demand is in line with an economy's long-run productive capacity—are lower than in the past and will likely remain low in the future.** This means that central banks will have less room to lower the policy rate in response to negative shocks. As a result, the Bank will likely have to use other monetary policy tools more often and may need to hold interest rates low for longer.
- **Major forces such as shifting demographics, technological change, globalization and shifts in the nature of work are having profound effects on the Canadian labour market**. This means there is increased uncertainty about the level of maximum sustainable employment. In other words, it has become more difficult to pin down the highest level of

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[1] See, for example, Macklem (2021) as well as Hsieh et al. (2019) and Ostry et al. (2018).

employment that the economy can sustain before inflation pressures build.

To manage these challenges, the Bank will continue to leverage the flexibility inherent in its framework. Specifically, when conditions warrant, the Bank will:

- use a broad set of monetary policy tools, as well as the 1 to 3 percent inflation-control range, to deal with the likelihood that the Bank's policy rate will be at its lowest possible level more often.
- actively seek the level of maximum employment needed to sustainably achieve the inflation target. The Bank will consider a broad set of indicators to gauge the health of the labour market and to inform its assessment of the economic outlook.

The Bank will use the flexibility of the 1 to 3 percent range only to an extent that is consistent with keeping medium-term inflation expectations well anchored at 2 percent. And the Bank will clearly explain when it is using that flexibility.

The Bank will continue to assess financial system vulnerabilities, recognizing that a low interest rate environment can be more prone to the development of financial imbalances. A variety of other policy instruments, such as macroprudential tools, are better suited than monetary policy to address these vulnerabilities. But because monetary policy can exacerbate financial vulnerabilities, the Bank will continue to be mindful of the risk that such vulnerabilities can lead to worse economic outcomes down the road.

Climate change poses substantial risks to the global and Canadian economies. While monetary policy cannot directly tackle the threats posed by climate change, the Bank will develop the modelling tools needed to take into account the important implications of climate change on the Canadian economy and financial system.

Conducting a more in-depth and comprehensive review

Past reviews of the inflation-control target agreement have included serious consideration of some alternative frameworks. However, the Bank has not performed a systematic comparison of a full range of alternatives since it adopted inflation targeting. For this latest review and renewal, the Bank used a combination of model simulations, lab experiments and public consultations

to run a "horse race" of key alternatives to inflation targeting, weighing the pros and cons of each:

- average inflation targeting
- a dual mandate, targeting both inflation and employment
- nominal gross domestic product (NGDP)—both level and growth— targeting
- price-level targeting

In this horse race, the current flexible inflation-targeting framework, along with average inflation targeting and a dual mandate, did better than other approaches that represent larger departures from the status quo. While neither average inflation targeting nor a dual mandate was judged to be better overall than the current approach, the Bank found value in some elements of each of these two alternatives. The Bank's research concluded that the inflation-targeting framework is flexible enough to mimic these key elements without the drawbacks associated with the alternative approaches.

Listening to Canadians

The Bank also significantly expanded its outreach activities to include public consultations with Canadians and discussions with a broader set of stakeholders and interest groups. Since the 2008–09 global financial crisis, central banks have implemented extraordinary policies and used a variety of new tools—putting central banks in the public eye more than ever. The Bank's recent public outreach was an important opportunity to assess the economic environment, gather input and ensure that the Bank's policies and decisions reflect the views of the people it serves. This, in turn, reinforces public trust. As well, gathering a more diverse range of views on the Bank's activities, decisions and frameworks—and on alternatives—ultimately leads to better policy outcomes.

Through these consultations, which took place in 2019 and 2020, the Bank aimed to:

- gain a better understanding of the concerns Canadians have about the economy and economic policy
- learn how the existing framework affects different groups of Canadians and how the alternative approaches might affect those groups

- assess how well people understand the different monetary policy frameworks and their trade-offs, since these frameworks are more effective if Canadians understand them well
- gauge people's awareness, understanding of and support for unconventional policy tools such as forward guidance and quantitative easing

The consultations and subsequent public opinion research demonstrated that Canadians are broadly confident in the Bank's ability to keep inflation low and stable, and that public trust in the Bank and the financial system would remain steady through the COVID-19 pandemic. Continued engagement and clear communications with Canadians will be required as the Bank navigates a period of above-target inflation as a result of the unique characteristics of the economic reopening and recovery from the pandemic.

Many Canadians were open to some change in the Bank's approach but generally supported the continued use of inflation targeting. Most viewed the current inflation-targeting framework as balanced, flexible and the most easily understood approach. Of the alternatives, a dual mandate received some interest—reflecting a desire by many Canadians for the Bank to consider how it could support the labour market—but many questioned whether an employment target would be achievable. Canadians also indicated an interest in average inflation targeting, which suggests a desire for more flexibility in how the Bank achieves the 2 percent target. The other frameworks—price-level targeting and NGDP targeting—were seen as less achievable or harder to understand.

The majority of participants emphasized the importance of the Bank being flexible in how it achieves the inflation target. Specifically, Canadians were most comfortable with an approach that targets a range for inflation and adjusts interest rates slowly to achieve the target. Many were open to accepting longer periods of above- or below-target inflation to support the economy and jobs.

Outlining the road to renewal

This background document describes the research and analysis that supported the new agreement on Canada's monetary policy framework.

Chapter 2 discusses Canada's experience with inflation targeting. **Chapter 3** explores the key challenges in conducting monetary policy given the shifts in the economic landscape. **Chapter 4** provides a detailed discussion of the Bank's comparison of alternative policy frameworks. **Chapter 5** examines the full range of monetary policy tools available in the Bank's tool kit. Finally, **Chapter 6** outlines how the Bank will conduct monetary policy under the renewed agreement.

Chapter 2: Canada's experience with inflation targeting

Over the past 100 years, Canada has used several monetary frameworks. These have included the gold standard, the Bretton Woods system of pegged exchange rates, monetary targets and, since the early 1990s, inflation targeting.

Canada first announced an inflation target in February 1991. After the target's introduction, inflation, as measured by the consumer price index (CPI), came down quickly, and since the late 1990s it has generally been low, stable and predictable (**Chart 1**). This stands in sharp contrast to the high inflation of the 1970s and early 1980s.

Inflation spent periods below the 2 percent target during the 2008–09 global financial crisis and the 2014–15 collapse in commodity prices and, in 2020–21, during the COVID-19 pandemic. As a result, average inflation following the global financial crisis up until the pandemic was below 2 percent.

Chart 1: Introducing inflation targets brought inflation down
12-month rate of increase, monthly data

Sources: Statistics Canada and Bank of Canada calculations

Last observation: October 2021

The COVID-19 shock presented unique challenges for monetary policy. The widespread closure of many sectors of the economy was met with aggressive fiscal and monetary policy stimulus. This stimulus supported a faster, albeit

uneven, recovery. The strong global recovery, particularly in the demand for goods, exacerbated supply constraints and higher energy prices. This led to an average inflation rate ofgoods in the first 11 months of 2021 of 4.4 percent, well above that of services at 2.1 percent. This contrasts sharply with recent trends: over the 20 years before the pandemic, goods inflation averaged only 1.4 percent while inflation for services was 2.4 percent. This rapid rise in inflation for goods was the key driver in above-target inflation during 2021.[2]

Notwithstanding periodic macroeconomic shocks such as the one Canadians are experiencing as a result of the COVID-19 pandemic, Canada's flexible inflation-targeting framework has kept inflation low, stable and predictable for three decades. It has been robust to a variety of economic circumstances and has enhanced welfare by fostering a more certain environment where planning for the future is easier.

Three key factors have contributed to the framework's success (Carter, Mendes and Schembri 2018):

▪ The inflation target is straightforward to explain and understand. This has improved accountability and allowed consistent application of the framework over time.

▪ The framework is based on an agreement between the Bank of Canada and the Government of Canada. The joint agreement grants the Bank operational independence to achieve the inflation target, while emphasizing that inflation control ultimately remains a shared commitment of both parties. The agreement also gives the target democratic legitimacy, further enhancing the target's credibility and helping to anchor inflation expectations.

▪ The regular, formal and transparent review and renewal process leads to continual improvement of the framework and its implementation. This process allows the Bank to incorporate lessons learned from historical experience and research.

Each renewal cycle has involved analysis of a range of issues. For instance, during the 2016 cycle, the Bank focused its review and research on the following three questions:

▪ Should the 2 percent inflation target be increased?

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[2] Gravelle (2021b) offers a discussion on the role of energy prices, shifts in demand across goods and supply constraints on consumer prices over 2021.
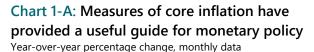
- To what extent should the conduct of monetary policy consider financial stability?
- How should core inflation be measured and used as an operational guide for the conduct of monetary policy? (**Box 1** presents an updated assessment of the core measures.)
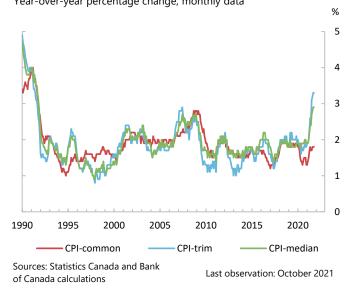
An updated assessment of the core measures

The inflation target in Canada is expressed in terms of consumer price index (CPI) inflation. Monetary policy achieves the inflation target by influencing domestic demand for goods and services, which, in turn, affects *underlying* inflationary pressures. Many other factors can also influence CPI inflation—for example, changes in the prices of commodities, which are set in global markets. Because the price movements are likely to be short-lived and the effects of monetary policy on inflation are delayed, the Bank of Canada focuses on the underlying rate when making policy decisions. It also uses forecasts for CPI inflation that go beyond the horizon of the temporary factors.

For the 2016 renewal of the inflation-control agreement, the Bank replaced CPIX inflation as its preferred measure of core inflation.[3] It adopted three other measures that performed well across a range of evaluation criteria—CPI-common, CPI-trim and CPI-median (**Chart 1-A**).[4] Using these three indicators of inflation over the past five years has helped the Bank manage the risks associated with relying on any single indicator.

Chart 1-A: **Measures of core inflation have provided a useful guide for monetary policy**

Year-over-year percentage change, monthly data

Sources: Statistics Canada and Bank of Canada calculations

Last observation: October 2021

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3 CPIX inflation excluded eight of the most volatile components of the CPI (fruit, vegetables, gasoline, fuel oil, natural gas, mortgage interest, intercity transportation and tobacco products) and adjusted the remainder for the effect of changes in indirect taxes.

4 CPI-common uses a statistical procedure to track common price changes across categories in the CPI basket. CPI-trim excludes upside and downside outliers. CPI-median is the median inflation rate across CPI components. For details, see Bank of Canada (2016) and Khan, Morel and Sabourin (2015).

From 2017 through 2019, the dynamics of all three measures were consistent with an economy where slack had largely been absorbed—all were within a narrow range and close to 2 percent. The use of these measures as a guide for monetary policy was tested more recently because of the uneven economic impacts of the pandemic. The three core inflation measures provided useful insights into underlying inflation given the unique shifts in demand and supply and the resulting price movements caused by the pandemic. For example, CPI-common initially fell, reflecting the large amount of excess capacity in the economy. However, CPI-median and CPI-trim filtered out most of the weakness in inflation in some hard-to-distance service sectors. As supply disruptions became prevalent in 2021, CPI-trim and CPI-median increased, reflecting the inflationary pressures from components experiencing supply constraints. Consequently, the range between the three measures widened further—highlighting the value of looking at more than one measure of underlying inflation.[5]

An updated evaluation of the statistical properties of the core measures confirms that no single measure dominates—each has strengths and limitations (**Table 1-A**).[6] Still, the three measures are more useful than others because they effectively capture persistent movements in inflation and they tend to move with the macroeconomic variables that monetary policy affects. The current measures also remain less biased and less volatile than other measures.

While the core measures have helped guide monetary policy, core inflation is just one of many inputs in the process. It is important to consider the three measures together with a detailed analysis of the determinants of inflation and broader measures of capacity pressures. These measures include, but are not limited to, labour market indicators, wages and other input costs such as commodity prices, estimates of the output gap, and business and consumer survey results.

Table 1-A: Summary of an evaluation of different core inflation measures

	CPI-common	CPI-median	CPI-trim
Unbiased	✔	✔	✔
Persistent	✪	✔	✔
Volatile	✪	✔	✔
Moves with output gap	✔	✔	✔
Looks through sector-specific shocks	✔	—	—
Has an easily understood methodology	✗	—	✔

✪	Top performance
✔	Favourable performance
—	Neutral performance
✗	Unfavourable performance

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5 See Bank of Canada (2021a) for a discussion of the movements in core inflation measures during the pandemic.

6 For details, see Lao and Steyn (2019).

The current review of the inflation-control target builds on the work done in previous renewal cycles.

Inflation targeting has not only consistently delivered low and stable inflation but also enhanced the resilience of the economy to external shocks, thereby reducing volatility and improving overall economic performance.[7] For example, real economic growth has been much steadier than it was before the adoption of inflation targeting (as shown by a declining standard deviation in **Table 1**). Nominal interest rates have also been lower and more stable. This is mainly because inflation expectations have declined, but also because the premiums to compensate investors for inflation risk have, on average, been smaller.

Table 1: Canada's economic performance before and after inflation targeting

	Average (percent)				Standard deviation			
			October 2016 to October 2021				October 2016 to October 2021	
	Jan 1975 to Jan 1991	Feb 1991 to Sept 2016	Oct 2016 to Dec 2019	Oct 2016 to Oct 2021	Jan 1975 to Jan 1991	Feb 1991 to Sept 2016	Oct 2016 to Dec 2019	Oct 2016 to Oct 2021
CPI: 12-month increase	7.1	1.9	1.9	1.9	2.9	1.1	0.4	1.0
Real GDP growth*	2.8	2.4	2.5	2.2	3.8	2.6	1.3	13.2
Unemployment rate†	8.9	8.0	6.1	7.0	1.7	1.5	0.4	1.9
3-month interest rate‡	10.8	3.5	1.6	1.2	3.0	2.2	0.4	0.7
10-year interest rate§	10.7	4.9	1.9	1.5	2.0	2.2	0.4	0.6
Months in inflation-control range (percent)	0.0	72.7	100.0	72.1				

* This is the annualized quarter-over-quarter growth rate for quarters within the time period. The table incorporates real GDP data through the third quarter of 2021.

† Unemployment data start in January 1976 with the introduction of a new labour force survey.

‡ The 3-month interest rate refers to the 3-month bankers' acceptance rate.

§ Due to data availability before June 1982, the 10-year interest rate refers to the yield of government bonds with maturations longer than 10 years; after June 1982, it is based on the 10-year government bond yield from Statistics Canada.

Sources: Statistics Canada, Investment Industry Regulatory Organization of Canada and Bank of Canada calculations

Overall, the stability in inflation over the past 30 years has increased the credibility of monetary policy and led to well-anchored inflation expectations.

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7 The inflation-targeting regime has contributed to Canada's improved economic performance for the past 30 years. It has allowed Canadian businesses and households to read price signals more clearly, to respond to relative price shocks more promptly and generally to allocate resources more efficiently. Canada's flexible exchange rate has complemented the monetary policy framework, facilitating economic adjustment to various internal and external shocks. Many other factors have also helped improve Canada's economic performance; these include the entrenchment of sound fiscal policy, rigorous prudential regulation and supervision, and structural reforms.
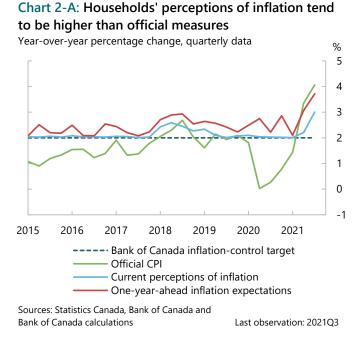
Public perceptions of current inflation, however, are often higher than measured inflation (**Box 2**). Nevertheless, the clarity and simplicity of the inflation target enhanced the credibility and the general effectiveness of monetary policy. Furthermore, the target made it easier for the public to hold the Bank accountable for its performance. Through the years, the Bank has sought to become more transparent in explaining its conduct of monetary policy (see **Box 10** in Chapter 6).

Box 2:

Differences between perceived and actual inflation

Survey data in several countries, including Canada, point to a gap between measured and perceived inflation. This could raise concerns that the consumer price index (CPI) does not accurately reflect inflation as experienced by many Canadians. Large differences between perceived and actual inflation could eventually undermine the legitimacy of the inflation-control framework.

The Bank of Canada held consultations with Canadians and studied possible explanations for the perception-measurement gap. Responses to the Bank's Canadian Survey of Consumer Expectations (CSCE) reveal the gap between measures and perceived inflation in Canada (Gosselin and Khan 2015). Households, on average, tend to believe inflation is higher than actual CPI inflation as measured by Statistics Canada (**Chart 2-A**). Still, current perceptions of inflation have

Chart 2-A: Households' perceptions of inflation tend to be higher than official measures

Year-over-year percentage change, quarterly data

- - - - - Bank of Canada inflation-control target
———— Official CPI
———— Current perceptions of inflation
———— One-year-ahead inflation expectations

Sources: Statistics Canada, Bank of Canada and
Bank of Canada calculations   Last observation: 2021Q3

been anchored firmly near the target. Consumer expectations of future inflation tend to be above the target and vary more than perceptions of current inflation.[8]

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8 There is also evidence of some backward-looking expectations, as those who expect high inflation in the future tend to perceive high inflation today.

Several factors can drive the perception-measurement gap (the difference between the blue and green lines in **Chart 2-A**).

First, the CPI basket does not represent the spending habits of all individual households. While the CPI measures the change in prices of goods and services purchased by the average household, each household purchases different proportions of the items in the CPI basket and experiences inflation somewhat differently. In the Bank's public consultations, participants said that in their view the CPI does not effectively capture the rising costs of certain goods and services—for example, the high cost of food in remote communities, education costs or the growth in housing prices across the country. To assess the importance of these differences, the Bank and Statistics Canada analyzed how the weights in the CPI basket could be adjusted to better represent the spending patterns of different demographic groups.[9] Results show that, on average, inflation rates based on spending baskets for different cohorts are relatively similar to official CPI inflation.

A second factor driving the perception-measurement gap relates to the concept of quality adjustment. Essentially, adjustments are made in the CPI to capture changes in the quality of products as new models or varieties are introduced. But consumers often do not recognize how much a product is improving over time and may focus on its rising price rather than its higher value. This phenomenon is particularly important for products with high rates of technological advancement. Without quality adjustments, CPI inflation would be only about 0.2 percentage points higher on average, which would explain just a small portion of the perception-measurement gap.

A third factor driving differences between perceived and actual inflation relates to housing. Participants in public consultations highlighted the growth in house prices as key to why they feel inflation is higher than 2 percent. Households usually consider housing costs to be the acquisition cost. However, in the CPI, housing is closer to a cost-of-living concept, measured as the imputed cost of services provided by housing.[10] In recent years, the growth in house prices has tended to be much greater than the increase in housing costs as measured by the CPI. This difference can explain about 0.3 percentage points of the gap between actual and perceived inflation.

Overall, the measurement issues reviewed seem to explain less than half of the perception-measurement gap. Other behavioural factors might also be at play. For instance, the loss of purchasing power as a result of significant price increases has been found to have an outsized psychological impact. To test this, an alternative CPI

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9 See Keshishbanoosy et al. (forthcoming).

10 The cost of housing includes all required expenses linked to living in and owning a house, including mortgage interest costs, home-insurance premiums, maintenance and repairs, and replacement costs. See Sabourin and Duguay (2015).

inflation was calculated by trimming 20 percent of price declines and 10 percent of price increases. Households' expectations were found to be close to this alternative measure of inflation, suggesting that consumers give more weight to price increases and that excluding large declines could explain a significant part (0.7 percentage points) of the gap between actual and perceived inflation.[11]

An important explanation of Canadians' elevated views of inflation could be information gaps. When information about prices is not readily available or is too costly to acquire, people rely on their own experiences to form expectations. Central banks can help fill the information gaps by making information more readily available and supporting economic literacy. Bank analysis shows that individuals update their views on inflation when they receive new information, particularly information about the Bank's inflation target and about inflation forecasts.[12] Knowledge is also key: the inflation expectations of people with higher financial and economic literacy are more in line with measured inflation. For instance, in the CSCE results, the perception-measurement gap is largest for respondents with low levels of education and income. In this context, new communication strategies to reach a broader audience and increase financial and economic literacy are worth exploring. The Bank's *The Economy, Plain and Simple* series and the Bank of Canada Museum's education programs are steps in that direction.

Large external shocks over the years (such as the global financial crisis and the COVID-19 pandemic) have led the Bank to use different tools within its inflation-targeting framework. These have included, for example, forward guidance and quantitative easing. However, inflation targeting as a framework has endured, both in Canada and in many countries (Rose 2020). Although economies faced different experiences during these shocks, no inflation-targeting central bank moved away from having a clear inflation objective.

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[11] Perceptions of inflation also appear to be partly determined by a consumer's own view of the costs of a small set of products and services, which constantly increase; these include food prices, the cost of renting and house prices (see Keshishbanoosy et al., forthcoming). However, while studies in other countries have found that recent shopping experiences and frequent purchases such as gasoline and food may affect households' overall inflation expectations, Keshishbanoosy et al. calculate Canadian CPI inflation for frequent purchases and find little difference over the past five years between the inflation rates of frequent purchases and that of the all-items CPI.

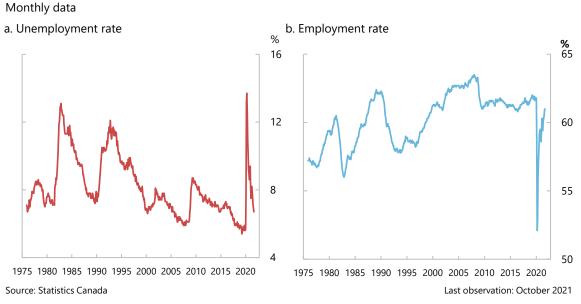[12] For details, see Kostyshyna and Petersen (forthcoming).

Low inflation and maximum sustainable employment

In essence, inflation targeting is about achieving low inflation together with maximum employment because, to sustainably achieve either, the economy needs both. Without maximum sustainable employment, the shortfall in jobs and incomes will pull inflation below target. And without inflation near its target and well-anchored inflation expectations, the economy would be less resilient to various shocks, leading to large fluctuations in employment.

Since maximum employment is not directly observable, and in practice it is hard to gauge when reached, a range of indicators should be examined to assess the health of the labour market.

The most common measure of the state of the labour market is the unemployment rate, which is defined as the percentage of the labour force that does not have a job and is actively looking for work.[13] Before the COVID-19 pandemic, the unemployment rate was close to a historic low due to strong gains in full-time jobs in the service sector (**Chart 2**, panel a).

Chart 2: **Before the pandemic, the unemployment rate was close to a historic low and the employment rate was rising**
Monthly data

a. Unemployment rate

b. Employment rate

Source: Statistics Canada

Last observation: October 2021

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13 The labour force is the total number of employed and unemployed in the economy.

A broader measure of labour market health is the employment rate, which is the number of employed people as a share of the working-age population. The maximum sustainable employment rate is determined largely by structural factors beyond the control of monetary policy. For example, the employment rate has risen over time (**Chart 2**, panel b). This is mostly due to increases in the employment rate for women until the early 2000s. That said, the inflation-targeting framework has contributed to reducing employment fluctuations by stabilizing overall demand.

More recently, the pandemic had a large and uneven impact on the labour market. The effects were more severe for certain sectors and their workers. Hard-to-distance service industries—where physical distancing is either difficult or impossible—suffered the most. Meanwhile, industries where physical distancing or remote work is possible—such as professional services, finance and public administration—were better able to adapt. These differences across sectors led to unequal consequences. Low-wage workers, women and young people were most affected.

Using flexibility

The Bank strives to make forward-looking policy decisions based on several important considerations, drawing from a wide range of information. To achieve this, the Bank has introduced a degree of flexibility into the practice of monetary policy with an inflation target. At times this has led to the use of different horizons to bring inflation back to target.

A key feature of the current policy framework is a risk management approach that allows policy-makers to weigh multiple factors and risks during policy deliberations. These include the risk of having the policy rate constrained by the effective lower bound (ELB), other forecast risks, employment considerations and financial stability concerns (Poloz 2020).[14] The Bank uses a variety of models, data analysis, survey evidence and judgment to inform its understanding of these factors and risks and how they might interact and affect its ability to control inflation. The flexibility in the inflation-targeting

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[14] Kozicki and Vardy (2017) describe the uncertainties that central banks face. For instance, uncertainty is inherent in measuring economic data and in unobserved metrics. Uncertainty is also linked to the models that are used to inform policy decisions. And unforeseen developments are always possible.

framework has allowed for adjustments in the expected time horizon for bringing inflation back to target.[15]

Other complementary policies could also help manage the trade-offs faced by inflation-targeting central banks (**Box 3**). For example, automatic fiscal stabilizers that increase spending during economic downturns can also help monetary policy achieve the inflation objective and stabilize the economy (MacKay and Reis 2016; Meh and Poloz 2018).

Box 3:

How monetary and fiscal policy can work together

Recent years have seen a revival of research into monetary and fiscal policies and how they can reduce fluctuations in the business cycle and increase resilience to external shocks. The 2008–09 global financial crisis showed that monetary policy alone may be not be enough to lessen the negative effects of large shocks, especially certain types. One implication is that the benefits of using both monetary and fiscal policies to lean against big shocks may be greater than previously thought.[16]

Monetary policy can generally react quickly to unanticipated changes in economic conditions by changing the short-term interest rate, although its full impact on the economy can take time. Changes to the short-term interest rate affect all firms and households regardless of their exposure to a shock. Fiscal policy, in contrast, can more easily target specific groups or sectors through transfer programs that are quick to implement, which is helpful when shocks affect firms or individuals differently. This has led some to argue in favour of a complementary approach, where both monetary and fiscal policies are used to moderate the effects of shocks.

Fiscal policy can contribute to macroeconomic stability through three main policy tools:

- **Automatic fiscal stabilizers,** such as employment insurance or progressive personal income taxes, can help stabilize business-cycle fluctuations. They do this by reducing swings in individuals' disposable income and redistributing resources from individuals with higher income to those with lower income. However, the impact of some automatic stabilizers may be less because they can distort labour

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15 See Bank of Canada, "Bank of Canada Releases Background Information on Renewal of the Inflation-Control Target," press release (November 9, 2011).

16 Dong et al. (2021) review the recent literature on the complementarities between fiscal policy and monetary policy for stabilizing economic activity.

market behaviour.[17] Because many automatic stabilizers have multiple policy objectives, how best to design them is an open question.

- **Changes to public spending and tax instruments** can be designed to offset business-cycle fluctuations by supporting aggregate demand. Some discretionary fiscal expenditures have short-term multipliers that are close to or above one, which means that each additional dollar of expenditure translates into close to an additional dollar of output. When interest rates are near the ELB, fiscal stimulus has a larger impact. While discretionary spending can focus on the specific policy priorities that are most relevant at the time, they may require legislation and some can take time to implement.
- **Government credit programs** extend credit to certain borrowers and market segments and can implicitly or explicitly guarantee obligations of government-sponsored enterprises. These credit policies can mitigate economic downturns that are exacerbated by severe financial market distress.

The policy responses to the economic effects of the COVID-19 pandemic illustrate how both fiscal and monetary authorities can respond rapidly to large shocks. The responses to COVID-19 included unprecedented fiscal actions in some countries, with large-scale programs introduced quickly to offset the sudden loss of income that some households and firms experienced. While some fiscal policies were targeted at the most affected households and firms, others were broader-based and relied on existing transfer and tax systems—in some cases because new programs take time to implement. Recent research examines the economic impact of various elements of the fiscal response to the pandemic. For example, MacGee, Pugh and See (2021) examine how the Canada Emergency Response Benefit (CERB) affected household savings and debt, and Petit and Tedds (2020) highlight differences in how Canadian provincial and territorial governments treated CERB payments in assessing eligibility for income assistance programs.[18]

During the pandemic, flexibility was exercised through an aggressive monetary policy response. The Bank quickly reduced the policy rate to its ELB, provided forward guidance and used additional tools such as quantitative

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17 A variation suggested in the academic literature is a pre-committed fiscal spending formula that would be triggered by certain macroeconomic conditions. Such a state-contingent, non-discretionary fiscal policy would have the advantage of being timely and easy to communicate. But identifying appropriate and robust triggers and sorting out how to develop credibility around the commitments could be challenging.

18 A growing literature examines programs introduced in other countries. For example, Autor et al. (2020) and Chetty et al. (2020) examine the Paycheck Protection Program (part of the US *Coronavirus Aid, Relief, and Economic Security Act*), while Romer (2021) asks whether aspects of the US fiscal response, such as one-time stimulus payments, were well targeted.

easing to support financial market functioning and reinforce the forward guidance. The forward guidance demonstrated that even without room to cut the policy rate further, the Bank can still provide monetary stimulus by making a commitment to hold the policy rate at its ELB for longer than the degree of excess capacity might suggest. Given the lags involved in the transmission of monetary policy, the Bank's response resulted in a projection for inflation that temporarily exceeded 2 percent. Nevertheless, the public could be confident that the Bank would remain focused on the inflation-control mandate even while pursuing aggressive monetary policy to support a stronger, broader-based recovery (see **Box 8** in Chapter 5).

To maintain its credibility and enhance the public's trust throughout the pandemic, the Bank also committed to being transparent about the parameters of its asset purchase programs and to reporting regularly on the evolution of the its balance sheet. The Bank's credibility and independence were evident in market perceptions following Bank actions. For instance, market expectations for policy rates generally tracked the Bank's forward guidance.[19] In addition, inflation expectations stabilized—allowing reductions in the policy rate to be more fully passed through to real borrowing costs.[20] The results of the Bank's consultations show that Canadians' trust in the Bank held firm or increased slightly during the pandemic and that people are highly confident the Bank can continue to achieve its inflation target (Bank of Canada 2021b).

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[19] The Bank's commitment in July 2020 to leave the policy rate at the ELB was contingent on achieving the inflation target on a sustainable basis. Following that announcement, market expectations for the policy rate flattened. In October, the Bank reinforced its commitment and specified that it did not expect to sustainably meet the inflation objective until some time in 2023. This updated forecast was credible because market pricing after the October announcement had the policy rate at the ELB until at least 2023. As the outlook brightened in late 2020, market pricing beyond 2022–23 moved slightly higher. But short-term yields remained anchored by the forward guidance. In October 2021, the Bank's projection was updated as the recovery progressed. The commitment to hold the policy rate at the ELB until economic slack is absorbed so that the 2 percent inflation target is sustainably achieved was then revised to sometime in the middle quarters of 2022.

[20] Professional forecasters' long-term inflation expectations remain firmly anchored at 2 percent, while consumer expectations in the Canadian Survey of Consumer Expectations and business expectations in the Business Outlook Survey have bounced back relative to their 2020 levels. Market-based measures of expectations fell at the start of the crisis, recovered as the Bank rolled out its quantitative easing program, and ticked up with the Bank's decision in July 2020 to commit to holding the policy rate steady until the inflation objective is sustainably achieved.

Chapter 3: Key challenges for the conduct of monetary policy

Over the past decade or so, several economic trends have accelerated, affecting the Canadian economy. The 2008–09 global financial crisis and the COVID-19 pandemic have had significant impacts on the global economy and financial system. And forces such as demographic shifts, globalization, new digital technologies and climate change are affecting the economic landscape.

These economic and social trends raise two key challenges for the conduct of monetary policy:

- The persistence of low interest rates since the global financial crisis has led to a growing consensus that low neutral rates are likely to continue for some time, constraining central banks' ability to provide stimulus through reductions in their policy rate.
- Major forces have increased uncertainty and made it harder to pin down the maximum level of employment that the economy can sustain before inflationary pressures build.

In addition, when conducting monetary policy, central banks need to consider the historically high levels of debt held by households and businesses. Despite significant advances in prudential financial regulations, particularly with respect to housing finance, a prolonged period of low interest rates could contribute to a buildup of financial vulnerabilities. Thus, while a number of prudential, macroprudential and housing policy instruments are better suited than monetary policy to address financial vulnerabilities, the possibility that monetary policy could exacerbate these vulnerabilities remains an important consideration.

A world of low neutral interest rates

The low interest rates observed in advanced economies since the global financial crisis partly reflect low neutral rates, which many agree are likely to persist in the coming years (e.g., Del Negro et al. 2019). This persistence means central banks will have less room to lower their policy rates before hitting the effective lower bound (ELB). As a result, ELB episodes are more

likely to occur in the future than they were during the first two decades of inflation targeting. Given the tendency for inflation to be below target during ELB episodes, more frequent ELB episodes may make it difficult for the Bank of Canada to achieve its inflation target of 2 percent.

To assess the likelihood of an ELB episode, we use the concept of the neutral rate of interest. The neutral rate is defined as the policy rate that coincides with output at potential and inflation equal to target after the effects of cyclical shocks have dissipated. Although estimates vary across countries and time periods, most agree that the neutral rate of interest has declined in advanced economies since at least the early 2000s and is likely to remain near its historical lows over the coming years.[21]

In Canada, both the actual policy rate and the estimated neutral rate have declined since the early 2000s (**Chart 3**). In the mid-2000s, the Bank assumed a nominal neutral rate of roughly 5 percent. Since the global financial crisis, estimates have shifted downward, and the 2021 Canadian nominal neutral rate estimate is in the range of 1.75 to 2.75 percent, with a midpoint of 2.25 percent (Brouillette et al. 2021).
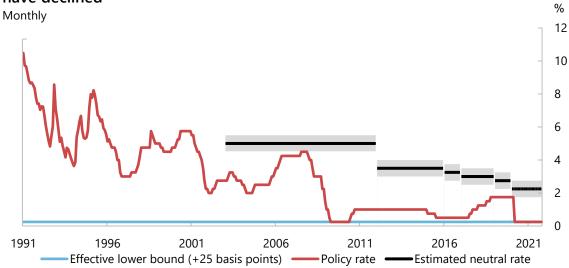
Chart 3: The Bank of Canada policy rate and the estimated neutral rate have declined

Monthly

Note: The grey range is the estimated range of the neutral rate, and the black line is the mid point of the range.

Source: Bank of Canada   Last observation: October 2021

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21 See, for example, Laubach and Williams (2003), Del Negro et al. (2019) and Feunou and Fontaine (forthcoming).

This decline in the neutral rate makes it more likely that monetary policy will reach its ELB in future economic downturns. With a lower neutral rate, central banks have less room to reduce the policy rate in response to negative shocks before reaching the ELB. Staff estimate that the likelihood that adverse economic shocks will result in the policy rate hitting its stated ELB of 0.25 percent has increased from 6 percent in 2016 to about 17 percent in 2021 (**Chart 4**, panel a).[22] The lower neutral rate has also extended the projected average duration of ELB episodes from 2.3 quarters in 2016 to about 7 quarters in 2021 (**Chart 4**, panel b).

Chart 4: The probability of being constrained by the effective lower bound on the policy interest rate has increased

a. Relative frequency of a binding effective lower bound

b. Average duration of effective lower bound episodes

Note: In both panels, the 2021 real neutral rate is 0.25 percent, the 2016 real neutral rate is 1.25 percent and the real neutral rate before the global financial crisis is 3 percent. Rates are calculated using the Bank of Canada's Terms-of-Trade Economic Model (ToTEM) III.
Source: Bank of Canada

The recent experience with the COVID-19 pandemic illustrates the implications of ELB episodes for inflation (see Chapter 2). Even with a rapid decrease of the policy rate to the ELB in response to weak aggregate demand, inflation fell well below the 2 percent target. This is consistent with analysis that ELB episodes often see inflation below target.

The risk of frequent and prolonged ELB episodes where inflation is persistently below target has raised concerns that inflation, over the medium term, may average below 2 percent. If inflation were to average below target for a prolonged period, households and firms could adjust their inflation expectations downward. This would cause the ELB to become even more of a

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22 Staff used the Bank's main dynamic stochastic general equilibrium model, the Terms-of-Trade Economic Model (ToTEM) III, for this analysis. See Corrigan et al. (2021) for details on ToTEM III.

constraint because it would be more difficult to reduce the real policy rate. As a result, central banks need to adjust how they conduct monetary policy. Changes could include using a larger suite of monetary policy tools and approaches more often. This would better mitigate the impacts of ELB episodes on employment and output and help avoid inflation remaining below 2 percent for extended periods of time (see Chapter 5).

Increased uncertainty about the level of maximum sustainable employment

Major forces, including demographic changes, technological advancements, globalization and shifts in the nature of work, have had profound effects on the Canadian labour market. These evolving forces have increased uncertainty around assessments of the level of maximum sustainable employment—the highest level of employment that the economy can sustain before inflationary pressures build. Added to this uncertainty is increasing evidence that the relationship between economic slack and inflation is relatively weak as long as inflation expectations remain firmly anchored.[23] As a result, inflation near 2 percent—by itself—is no longer a sufficient signal that the economy has reached maximum sustainable employment.

The increased uncertainty about the level of maximum sustainable employment poses a challenge to the conduct of monetary policy. When deciding on monetary policy actions, the Bank looks ahead and adjusts the degree of monetary stimulus to affect the level of total demand and help close the output gap. Because inflation expectations are well anchored at 2 percent, inflation should return sustainably to target when slack is absorbed and the economy is restored to maximum sustainable employment and its productive capacity. However, with increased uncertainty regarding the level of maximum sustainable employment, the risk of misjudging the appropriate stance for monetary policy has increased.

Identifying the level of maximum sustainable employment has never been easy. Indeed, many researchers have documented the wide confidence intervals associated with estimates of the output gap or of the non-

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23 Economic slack refers to resources in the economy that are not being fully utilized. These resources include people who would like to work but are unable to find a job as well as machinery and equipment that are not being used.

accelerating inflation rate of unemployment (NAIRU)—a commonly used measure of maximum sustainable employment. It should not be surprising that identifying maximum sustainable employment is challenging because the labour market itself is not one single market. It is, in fact, the sum of many markets, differentiated by a variety of characteristics, including skill, industry and location. Consequently, it is difficult to know whether everyone who wants to be working is doing so, in a job that matches their skill set.

Ongoing structural changes in labour markets over the past few decades have caused the level of maximum sustainable employment to change, making this challenge even greater (**Box 4**). For example, an aging population and higher levels of immigration have had an impact on the mix of workers' skills. At the same time, globalization and technological change—especially digitalization—have affected labour demand. These still-evolving forces have shifted the demand for and supply of different skill sets, and their net effect on maximum sustainable employment is unclear.

Box 4:

Evolving uncertainties about the estimation of the output gap and maximum sustainable employment

Economic research has documented the substantial uncertainties around the measurement of unobservable variables, such as the output gap and maximum sustainable employment.[24] These variables feature prominently in the macroeconomic models that central banks use to predict when inflationary pressures will emerge.

Structural changes in labour markets—driven by ongoing demographic shifts, globalization and technological change, especially digitalization—have heightened these uncertainties. These changes are affecting the demand for and supply of different skill sets and possibly creating job mismatches. Since the 2008–09 global financial crisis, employment rates (defined as the ratio of employed individuals to

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[24] Champagne, Poulin-Bellisle and Sekkel (2018) and Barnett, Kozicki and Petrinec (2009) show that the Bank of Canada's real-time estimates of the output gap are subject to large revisions. Similar results have been found for other countries. For example, Orphanides and Van Norden (2002) show that real-time econometric estimates of the output gap in the United States are subject to large revisions. Uncertainties around estimates of the non-accelerating inflation rate of unemployment in Canada have been documented by Rose (1988) and Setterfield, Gordon and Osberg (1992). Recent work by Brouillette et al. (2019) also finds that estimates of the trend unemployment rate in Canada continue to come with large confidence intervals. These uncertainties around estimates of maximum sustainable employment are also well established for other countries. For example, Staiger, Stock and Watson (1997) report that it is not uncommon for the 95 percent confidence bands for the US NAIRU to be roughly 3 percentage points.

working-age population) for both men and women have remained below their pre-recession levels (see Chapter 2). These lower employment rates are partly due to long-term declines in the labour force participation rates of individuals aged 15 to 24, which are the result of increased school enrolment. However, these changes have been accompanied by a rising prevalence of part-time or short-term work, especially among young Canadians.[25] A related but distinct trend is the increase in "gig" employment in which the worker is an independent contractor rather than an employee.[26]

While the net effects of these forces on maximum sustainable employment are unclear, uncertainty about the level of maximum employment appears to be particularly high after recessions. All of the decline in jobs involving routine work in Canada occurred during recessions (Blit 2020), reinforcing the notion that firms restructure their production processes during these times.[27] The share of long-term unemployed workers rose in Canada during the global financial crisis (Kroft et al. 2019). A longer duration of joblessness not only increases the tendency for unemployed individuals to leave the labour force but also reduces the likelihood that non-participants will enter the labour force to search for jobs.[28] This suggests that the trends in labour force participation and job polarization are intertwined. Areas more severely hit by the global financial crisis in the United States observed a persistent decline in their employment rates as workers chose to leave the labour force (Yagan 2019), suggesting the possibility of labour market hysteresis.[29]

The question of how to respond to increased uncertainty about the level of maximum sustainable employment is further complicated by growing evidence that the slope of the Phillips curve—the relationship between inflation and economic slack for a given level of expected future inflation—is flatter than previously thought. This means that inflation is less sensitive to

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25 Morissette (2021) finds that since 1976, among youth aged 15–30 who are not in school, the proportion working part-time as opposed to full-time jobs has increased substantially, and most of this increase has been involuntary.

26 More information about the gig economy can be found in Kostyshyna and Luu (2019) and Jeon, Liu and Ostrovsky (2019). Also, for research on multiple-jobholding patterns, see Kostyshyna and Lalé (2019).

27 A growing line of research classifies jobs as routine or non-routine based on descriptions of the tasks required. Jaimovich and Siu (2020) suggest that the hollowing out of routine jobs in the United States is concentrated during recessions.

28 The unemployment rate is an imperfect measure of total slack (excess capacity in the form of potential workers) in the labour market. For example, during a downturn, previously active job seekers may get discouraged and stop looking for work, and people intending to enter the labour force may put off doing so. At such times, participation in the labour market falls, and this can give misleading signals about how much employment really exists.

29 For a recent examination of the similarities between the Canadian and US labour markets, see Albouy et al. (2019).

changes in economic conditions. The evolving view of the relationship between inflation and economic slack reflects not only the success of inflation targeting in anchoring inflation expectations since the 1990s but also recent research (**Box 5**).[30]

Implications of a flat Phillips curve

The Phillips curve (PC) plays an important role in macroeconomic modelling in academia and at central banks. Broadly speaking, the PC relates inflation to a measure of economic slack, such as the output gap or the deviation of the unemployment rate from an estimate of its natural rate and expected future inflation.[31]

Although estimates of the PC can depend on model specification and sample period, evidence is growing that the slope of the PC since the early 1990s has been relatively flat (Landry and Sekkel, forthcoming).[32] A flatter slope of the PC means that large fluctuations in the output gap are consistent with relatively stable inflation (Ball and Mazumder 2011; Del Negro et al. 2020).

The flatness of the slope of the PC has important implications for how informative inflation is about whether the economy is close to the maximum sustainable level of employment (or potential output). In practice, inflation is measured imperfectly, and transitory shocks (e.g., short-term supply disruptions) can temporarily affect the level of inflation. With a flat PC and shocks to inflation, inflation can often be close to 2 percent even if the economy is below (or above) maximum sustainable employment or potential output.[33]
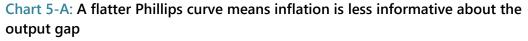
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[30] See Kryvtsov and MacGee (2020) for a review of recent research on inflation dynamics and experience with below-target inflation.
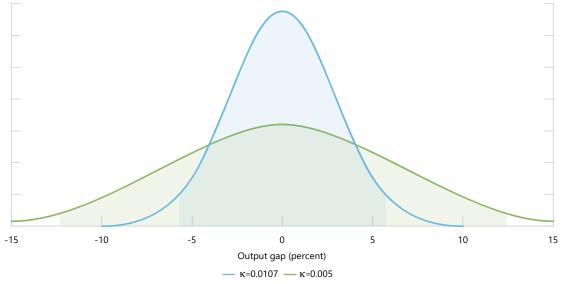
[31] See Cacciatore, Matveev and Sekkel (forthcoming) for a more in-depth discussion.

[32] The formulation of the PC has evolved together with macroeconomic thinking (see Gordon 2011). Beaudry and Doyle (2000) estimate an accelerationist version of the PC for Canada and detect a decrease in the slope around 1990. Kichian (2001) estimates a time-varying parameter PC and finds similar evidence. Recent structural estimates of the New Keynesian PC by Corrigan et al. (2021) also find a relatively flat PC for Canada. Recent innovative work by Hazell et al. (2020) uses US regional data to identify the slope of the PC and concludes that the slope has been flat since the 1980s. Furthermore, they argue that the sharp drop of inflation in the United States during the 1980s was mostly due to shifting long-term inflation expectations. Similarly, Fitzgerald et al. (2020) use data from metropolitan statistical areas in the United States from 1976 to 2010 and find a stable relationship between the unemployment rate and inflation. Ongoing research explores the possibility of a convex PC—that is, the slope of the PC increases the more the economy grows above potential. To date, the literature has not reached a clear consensus on the convexity of the PC (Cacciatore, Matveev and Sekkel, forthcoming).

[33] The estimated slope can depend on whether one uses a measure of core consumer price index (CPI) inflation or total CPI. Although measures of core inflation are less volatile than total CPI and provide a better measure of underlying inflationary pressures, they do not filter out all temporary shocks (see **Box 1**).

An example that illustrates how a flatter PC could lead to current inflation being less informative about maximum sustainable employment is shown in **Chart 5-A**. Building from a two-equation model where inflation and potential output are both subject to unobservable shocks, Cacciatore, Matveev and Sekkel (forthcoming) infer the probability distribution for the output gap, conditional on inflation being at 2 percent.[34] Shaded areas in the chart represent the probability of the level of the output gap (with 95 percent confidence). The two curves correspond to pre- and post-1990s estimates of the slope of the PC reported by Hazell et al. (2020). With a flatter slope (seen in the smaller value of the slope coefficient, κ), the distribution of the output gap becomes much more dispersed. As a result, with inflation at 2 percent, a flatter slope means that confidence that the output gap is closed is much lower.

Chart 5-A: A flatter Phillips curve means inflation is less informative about the output gap

Output gap (percent)

— κ=0.0107 — κ=0.005

Note: The two distributions of the output gap are derived using alternative values of the slope of the Phillips curve, κ, taken from Hazell et al. (2020). The pre-1990s value is 0.0107 and the post-1990s value is 0.005.

A relatively flat Phillips curve poses a two-sided risk to monetary policy. On one hand, it suggests that a more patient approach to tightening monetary policy could have modest impacts on inflation in the near term. On the other hand, it implies that if monetary policy is slow to respond to a sustained

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34 Carter and Mendes (forthcoming) offer an alternative approach that allows the PC to take a nonlinear, convex shape under which the curve steepens as the output gap becomes more positive. In this context, inflation outcomes are relatively uninformative about the maximum sustainable level of output at low levels of output but become more informative at higher levels of output.

buildup of inflationary pressures, bringing inflation back to its target may be costly.

With a flatter Phillips curve, observing inflation near 2 percent is less likely to imply that the economy is operating near maximum sustainable employment (see **Box 5**). Given the uncertainty associated with ongoing structural changes in labour markets, this suggests that it is now more difficult to know when maximum sustainable employment is attained and the output gap is closed. This raises the question of whether changes to the practice of monetary policy could help the Bank better assess the maximum level of sustainable employment consistent with the 2 percent target for inflation. For example, a patient approach to applying monetary stimulus could help draw individuals with limited attachment to the labour force into more productive employment and help reduce persistent disparities in economic opportunity and income. However, inflation expectations must remain well anchored for monetary policy to succeed in keeping inflation on target.

Historically high levels of private debt

The historically high level of debt relative to gross domestic product (GDP) among households and businesses remains an important consideration for the conduct of monetary policy. Since 1990, household sector debt relative to GDP has doubled and now exceeds 100 percent.[35] Although private, non-financial business debt has grown more slowly since 1990, it also exceeds 100 percent of GDP.[36] With the expectation that interest rates will remain low as a result of a low neutral rate of interest, the risk of a further buildup of debt and associated financial vulnerabilities remains a concern (e.g., see the Bank's 2021 *Financial System Review*).

Since the 2016 renewal of the monetary policy framework, the Bank has been mindful of the risks associated with high levels of household or corporate debt (Bank of Canada 2016). Elevated debt levels may create a difficult trade-off between stabilizing inflation today and doing so tomorrow in the face of

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[35] Despite the doubling of household debt relative to GDP, the fraction of household income spent on debt payments remains slightly below its 1990 level. While the rise in debt has led to higher principal payments, the fall in nominal interest rates has lowered interest payments by more.

[36] For a discussion of some of the challenges involved in measuring private, non-financial business debt, see Duprey, Grieder and Hogg (2017).

financial vulnerabilities or macroeconomic imbalances (Beaudry 2020a).[37] Monetary policy can mitigate some concerns about elevated financial vulnerabilities by flexibly adjusting both the horizon for returning inflation to target and the corresponding interest rate path (Bank of Canada 2011; 2016). One tool to help quantify these potential trade-offs is the Bank's recently developed growth-at-risk framework (Adrian, Boyarchenko and Giannone 2019; Duprey and Ueberfeldt 2020; Boire, Duprey and Ueberfeldt 2021). While the growth-at-risk framework offers important insight, research continues on how best to model the intertemporal trade-off generated by elevated debt levels and incorporate it into monetary policy decision making.[38]

Research is continuing into the mix of policies that could best mitigate and limit the buildup of financial vulnerabilities.[39] Based on the recent Canadian experience, a variety of prudential, macroprudential and housing policy instruments exist that are better suited than monetary policy to address these vulnerabilities (**Box 6**). Further investments in strengthening Canada's macroprudential policy framework could also potentially increase the effectiveness of these policies (International Monetary Fund 2019). Given the importance of financial stability for good macroeconomic performance, this issue will remain important for monetary policy.[40]

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37 The Bank discussed the possibility that some alternative paths for the policy rate could have similar implications for inflation but different implications for the level of financial vulnerabilities. This illustrates that in some situations no trade-off may exist between stabilizing inflation today and stabilizing it tomorrow in the face of financial vulnerabilities. Monetary policy can also be a blunt and costly tool to target financial vulnerabilities, especially compared with other tools such as macroprudential policies (Bank of Canada 2016).

38 The growth-at-risk concept provides a quantitative assessment of the trade-offs between different risks. In this framework, choosing a rate path to minimize the departure of inflation from the target not only minimizes macroeconomic risks to economic growth but also has consequences for financial stability risks to economic growth. The framework still involves an element of judgment, as many of the relationships are estimated imprecisely. Current research focuses on developing a framework that is more explicit about the mechanisms at play—for example, exploring the formation of expectations, which can play a key role in the development of financial vulnerabilities because departures from rational expectations can amplify boom-bust dynamics.

39 For a recent example, see Schroth (2021).

40 A related consideration is that high levels of debt may affect the transmission of monetary policy (e.g., Kaplan, Moll and Violante 2018; Cloyne, Ferreira and Surico 2020). For example, Kartashova and Zhou (2020) examine how Canadians with mortgages, which account for the majority of household debt, respond to changes in interest rates when their mortgages come up for renewal. The authors find that changes in interest rates at renewal have an asymmetric impact on consumer durable spending, deleveraging and defaults, with borrowers deleveraging if rates rise at renewal. These asymmetric responses point to a risk that consumption could become more sensitive to changes in interest rates.
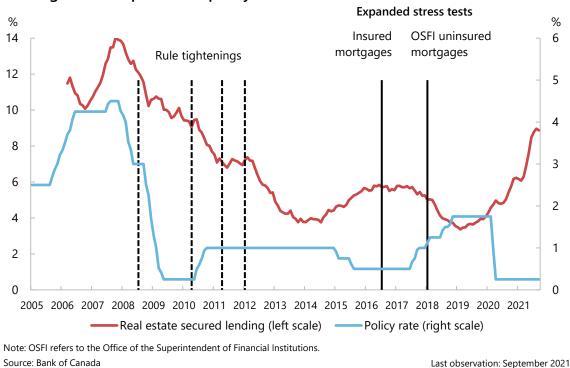
Box 6:

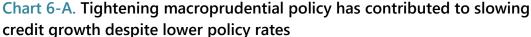# Macroprudential and monetary policy—Canadian experience since the global financial crisis

For over a decade, the Bank of Canada has emphasized the evolution of household financial vulnerabilities in its *Financial System Review*. Macroprudential policies have adapted to address the vulnerabilities in Canadian housing and mortgage markets. In particular, federal authorities—both the Department of Finance Canada and the Office of the Superintendent of Financial Institutions (OSFI)—implemented and expanded stress tests for insured and uninsured mortgages. These built on earlier measures introduced between 2008 and 2012 to lower the riskiness of new mortgage debt.

Following the global financial crisis, federal mortgage insurance qualification criteria were tightened. Between 2008 and 2012, the maximum amortization of insured mortgages was lowered from 40 to 25 years, and the loan-to-value (LTV) ratio limit was reduced from 100 to 95 percent for a purchase and from 95 to 80 percent for refinancing.[41] Overall, the rule tightening likely contributed to slower credit growth after 2012 despite continued low interest rates (**Chart 6-A**).

The Bank's policy rate remained constant between September 2010 and January 2015. In 2015, a sharp decline in oil prices prompted the Bank to cut its policy rate to 50 basis points. This reduction, along with continued downward pressure on long-term yields in international markets, pushed five-year fixed-rate mortgages down to then-record lows of 2.4 percent (**Chart 6-A**). This period of low mortgage rates also saw a steady increase in the share of insured mortgage originations (with LTV ratios above 80 percent) and uninsured mortgage originations (with LTV ratios less than 80 percent) with a loan-to-income (LTI) ratio over 450 percent.

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[41] For an overview of the Canadian mortgage market and related policy tools, see Ahnert, Bengui and Peterson (forthcoming) and Kuncl (2016). In Canada, a refinance is defined as a mortgage origination where borrowers either increase the amount borrowed (i.e., cash out) or extend the remaining amortization. In addition, some mortgage renewals allow a borrower to switch lenders at the end of a mortgage term and sign a new contract with a new interest rate and mortgage term. The ability to renew a mortgage is not affected by the rule changes regarding refinancing.

Chart 6-A. Tightening macroprudential policy has contributed to slowing credit growth despite lower policy rates

Note: OSFI refers to the Office of the Superintendent of Financial Institutions.

Source: Bank of Canada

Last observation: September 2021

To counteract this growth of highly indebted households, the Department of Finance Canada expanded the stress test for insured mortgages in 2016, while OSFI expanded the stress test for uninsured mortgages in 2018.[42] These tightenings of policy by federal authorities effectively increased by 200 basis points the rate used to calculate the maximum debt service ratio to qualify for a mortgage. The result was a sharp decline in the share of newly originated mortgages with an LTI ratio greater than 450 percent.[43]

Overall, the recent Canadian experience suggests that the macroprudential measures on mortgages from 2008 to 2012, along with the expansion of stress tests in 2016, have dampened credit growth resulting from lower policy rates. The stress test on insured mortgages has worked to limit the growth of highly leveraged borrowers (with a high LTI ratio and an LTV ratio at 95 percent). However, interest rates still

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[42] For more details on the expanded stress tests, see Bank of Canada (2018).

[43] The OSFI stress test coincided with an increase in interest rates, which makes it difficult to separate the effects of the stress test from those of higher mortgage rates (see Ahnert, Bengui and Peterson, forthcoming).

appear to have a strong effect on the Canadian housing market and mortgage originations.[44]

The bottom line is that evidence suggests that macroprudential measures have countered the buildup of financial vulnerabilities in Canada, lowering the likelihood and severity of a shock affecting the entire financial system. However, household debt remains elevated, and house prices have continued to increase rapidly. Thus, the ability of macroprudential policy to prevent excessive risk taking during a period of low interest rates may be incomplete. For this reason, monetary policy must be mindful of its potential effects on financial vulnerabilities.

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[44] A related question is whether the buildup of financial vulnerabilities can contribute to future contractions in the economy (as highlighted by Adrian, Boyarchenko and Giannone 2019). That is, can financial vulnerabilities create macroeconomic risk independent of systemic financial risk? And if so, should macroeconomic stability be considered a macroprudential policy objective in addition to that of managing systemic risk to the financial system?

Chapter 4: Lessons from a comparison of alternative frameworks

As the 2021 renewal approached, important economic challenges—including the lower neutral policy rate and uncertainty in the labour market—played key roles in shaping a broad-based review of the Bank of Canada's monetary policy framework. The Bank thus conducted a "horse race" that consisted of a side-by-side review of the main alternatives to inflation targeting.[45] This review involved model simulations, lab experiments and public consultations.

In addition to the Bank's existing flexible inflation-targeting (FIT) framework, the comparison included:

- average inflation targeting (AIT)
- price-level targeting (PLT)
- an employment-inflation dual mandate
- nominal gross domestic product (NGDP)–level targeting
- NGDP-growth targeting

The Bank considered these frameworks because of their potential to address the challenges discussed in Chapter 3. They are also the alternative frameworks that have received the most attention in the economics literature and in the broader discussion of monetary policy. Results from model simulations, lab experiments and public consultations all factored into the Bank's evaluation of the frameworks against a range of qualitative and quantitative criteria.

The analytical findings of the horse race align broadly with the results of consultations with experts and the Canadian public. The current FIT framework, AIT and a dual mandate were favoured over the other regimes, which represented a larger departure from the status quo. In addition, while neither AIT nor a dual mandate was judged to be better than FIT, the analysis found value in some elements of each of these two alternatives.

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45 In past renewals, the Bank considered specific modifications or alternatives to the existing framework, such as changing the level of the inflation target or adopting price-level targeting.

Key differences in the frameworks

The frameworks differ primarily in their degree of history dependence and whether they include an explicit role for stabilization of a real variable.

Degree of history dependence

A framework is history-dependent if current policy relies on past outcomes, even if those past outcomes are otherwise no longer relevant to how the economy is evolving.[46] All else being equal, frameworks that involve a commitment to make up for past deviations from some target variables involve more history dependence than others. If individuals and private sector businesses understand this commitment, it can shape their expectations and behaviour. This influence on private sector expectations is particularly beneficial when the policy rate is constrained by the effective lower bound (ELB). Inflation is usually lower than the target during much of an ELB episode, so it must subsequently "overshoot," or be higher than, the target under a history-dependent framework. This can help create expectations that the policy rate will stay low for a longer period than would be required to return inflation to target. Such expectations can stimulate demand even when the policy rate is constrained by the ELB because they can affect long-term borrowing rates, the exchange rate and asset prices. These results depend critically on how the framework can condition the expectations of market participants, businesses and the broader public.

In the horse race, the degree of history dependence embedded in the target variables differs.

- **Flexible inflation targeting:** Monetary policy aims to achieve the inflation target on a forward-looking basis, without reference to past deviations of inflation from the target. The specification of the target variable does not depend on history. In other words, bygones are bygones.
- **Average inflation targeting:** Monetary policy seeks to return a finite, multi-year average of inflation to 2 percent. Since observations eventually drop out of the averaging window and cease to be relevant, AIT has some history dependence in the specification of the target variable.

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[46] See Woodford (2003) for a more detailed discussion of the definition and role of history dependence in monetary policy.

- **Price-level targeting:** Monetary policy seeks to make up for all past deviations of inflation from its target to return the price level to a predetermined target path that is consistent with 2 percent average inflation. The average is calculated from a fixed date in the past, so the averaging window grows over time. This approach carries a higher degree of history dependence than AIT.
- **Dual mandate:** A dual mandate could be implemented by adding an employment mandate to any of FIT, PLT or AIT, so the degree of history dependence hinges on the price stability goal. In the Bank's horse race, the focus is on adding an employment objective to FIT, so no history dependence is embedded in the target variables.
- **NGDP-level targeting:** Monetary policy seeks to maintain the level of NGDP on a predetermined path that is consistent with a targeted average nominal growth rate. As under PLT, this results in a high degree of history dependence.
- **NGDP-growth targeting:** Monetary policy aims to stabilize NGDP growth around a target rate. As under FIT, there is no history dependence in the specification of the target variable.

In a wide range of macroeconomic models, the appropriate degree of history dependence generally depends on the extent to which the private sector is assumed to form its inflation expectations on a rational, forward-looking basis. If private sector expectations are mostly rational and forward-looking, then highly history-dependent frameworks such as PLT tend to perform best due to their influence on inflation expectations. In contrast, if private sector expectations are largely backward-looking, then history dependence can lead to volatility in the real economy. Therefore, how these expectations are modelled plays an important role in the evaluation of the alternative frameworks.

Stabilization of a real economy variable

The frameworks also differ in terms of whether or not they include an explicit role for stabilization of a real variable, such as output or employment, in response to shocks.

- **Flexible inflation targeting:** The Bank's current FIT framework does not include an explicit objective to stabilize a real economy variable, but the real economy's performance is nonetheless a central consideration. Full employment and output at potential are necessary conditions for

achieving the inflation target on a sustained basis. In addition, the FIT framework's flexibility allows the Bank to consider implications for the real economy when determining how quickly to return inflation to target.

- **Average inflation targeting:** Similar to FIT, AIT does not include an explicit real economy objective, but achieving full employment and output at potential are necessary for keeping average inflation sustainably on target over a prescribed period.
- **Price-level targeting:** Similar to FIT, PLT does not include an explicit real economy objective, but full employment and output at its potential are necessary for keeping the price level sustainably on its target path.
- **Dual mandate:** With a distinct goal related to employment, a dual mandate makes the stabilization of employment more explicit than under FIT.
- **NGDP-level or -growth targeting:** NGDP-level and -growth targets naturally include an explicit role for output or output growth stabilization because NGDP is the product of the GDP price deflator and real GDP.

Results of the comparison

The Bank evaluated the frameworks using simulations in several different economic models. The use of multiple models helps to isolate the key mechanisms and assess the robustness of the main results. The Bank also tested the frameworks in laboratory experiments in which participants were asked to make decisions in the context of artificial economies. Finally, the Bank's extensive public consultations provided useful insights into Canadians' views on the alternative monetary policy frameworks (**Box 7**).

Box 7:

Public consultations on monetary policy frameworks

In 2019–20, the Bank of Canada asked Canadians for their views about the current inflation-targeting framework as well as several alternative frameworks. In an online survey and focus groups, the Bank asked how well people thought each of the frameworks could:

- achieve low and stable inflation
- provide a solid environment for growth and jobs
- support financial stability

The Bank also asked how easy it would be to communicate each of the frameworks to Canadians. More than 8,500 individuals completed the survey. Perceptions about the difficulty in understanding each alternative framework were similar across all demographic profiles, including age, gender, salary and education.

Low, stable inflation is most important to Canadians

Overall, over half of respondents (53 percent) said they would prefer to have stable and predictable inflation so that they can better plan their lives. Only 27 percent said steady economic growth was more important, while 20 percent said maximum sustainable employment was more important.

Participants felt the groups most affected by inflation were people on fixed incomes, the economically disadvantaged and seniors. Focus group participants frequently mentioned growing inequality and disparities between "haves" and "have nots" as issues they cared about. Many participants recognized and valued the important role controlling inflation can play in mitigating inequality.

Views on monetary policy frameworks were diverse

In the consultations, Canadians expressed a variety of views on the different monetary policy frameworks under review. Average inflation targeting was seen as the easiest to understand of the alternatives to flexible inflation targeting (FIT), as well as the easiest framework for the Bank to achieve. Participants said they prefer that the Bank take longer to get back to the target with smoother adjustments in interest rates over a longer period rather than moving quickly back to the target with sharp and rapid interest rate changes.

Most of the survey respondents (80 percent) said a dual mandate was easy or somewhat easy to understand. Almost 60 percent felt it would be difficult to achieve, while almost 40 percent thought it would not be better than the current framework. A dual mandate also elicited the most polarized responses. Many participants suggested it could lead to the Bank becoming too politicized, and they questioned how much of an impact monetary policy could ultimately have on employment.

About half of participants indicated they thought nominal gross domestic product (NGDP)–growth targeting would not improve upon the Bank's current framework. NGDP-growth targeting was also least likely to be identified as the approach that would best serve Canadians.

Overall, most people consulted supported the continued use of FIT as the Bank's approach to monetary policy. They recognized that a targeted range for inflation works well for different economic situations and allows for a smoother adjustment in interest rates over a longer time period. The majority viewed inflation targeting as the most easily understood approach.

Criteria

The Bank used a range of quantitative and qualitative criteria to evaluate the alternative frameworks.

- **Macroeconomic stability:** Because the effects of monetary policy are primarily macroeconomic in nature, much of the evaluation focused on stability of prices and of the real economy (e.g., output and employment).
- **Financial stability:** A number of prudential, macroprudential and housing policy instruments are better suited to address financial vulnerabilities, but the monetary policy framework can also have implications for financial stability.
- **Distributional impact:** The Bank sought to understand the distributional implications of alternative frameworks. Structural factors tend to affect long-term distributional trends, but the choice of monetary policy framework can influence inequality during short-term fluctuations in the economy.
- **Robustness:** A monetary policy framework must perform well in many different circumstances. For this reason, the Bank evaluated the robustness of frameworks to different economic shocks and behavioural assumptions.
- **Understandability:** Monetary policy works best when it is well understood. The implications for communications and credibility are important, even if difficult to measure. The public consultations and laboratory experiments were essential for this part of the evaluation.

To perform well for all these criteria, a monetary policy framework must be able to keep inflation expectations well anchored. The anchoring of inflation expectations under FIT has allowed the Bank to react aggressively when necessary and to take into account employment and other considerations beyond inflation. Without well-anchored inflation expectations, monetary policy would need to focus much more strictly on keeping inflation on target.[47]

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47 Modern economic theory and empirical evidence indicate that inflation expectations are the main factor influencing inflation. By keeping inflation expectations well anchored at target, monetary policy can maintain inflation close to that target. Moreover, when inflation expectations are well anchored, movements in the policy rate translate more directly into changes in the real interest rate, strengthening the effectiveness of monetary policy.

Analytical approaches

The Bank conducted most of the analysis of macroeconomic performance using the Terms-of-Trade Economic Model (ToTEM), one of the Bank's main models of the Canadian economy (Corrigan et al. 2021).[48] Many of ToTEM's parameters are estimated to match the historical dynamics of the Canadian economy. Notably, ToTEM's structural equations assume that a significant fraction of price- and wage-setters base their expectations on rules of thumb, while the remainder act rationally. The importance of rule-of-thumb behaviour undermines the performance of highly history-dependent frameworks such as PLT and NGDP-level targeting. In contrast, FIT, AIT and the dual mandate all perform relatively well in ToTEM (Dorich, Mendes and Zhang 2021; Swarbrick and Zhang, forthcoming).

Given the central role private sector expectations play in how well history-dependent frameworks perform, the Bank conducted additional analysis using purpose-built models. Wagner, Schlanger and Zhang (forthcoming) compare the performance of alternative frameworks in a model with bounded rationality, or "cognitive discounting."[49] They confirm the ToTEM results regarding the underperformance of highly history-dependent frameworks. Amano et al. (2020) study the optimal degree of history dependence under AIT in a model where some firms have adaptive expectations. They find that the best time frame for targeting average inflation is slightly less than two years.

The Bank also conducted laboratory experiments to evaluate people's ability to forecast inflation and output under different frameworks (Kostyshyna, Petersen and Yang, forthcoming). Actual inflation and output outcomes are determined using a simple New Keynesian model, conditional on subjects' median forecasts. Results suggest that FIT and the dual mandate are the most stabilizing regimes, followed by AIT. Highly history-dependent policies performed poorly.

ToTEM is not well suited for assessing the implications of alternative frameworks for the distribution of income, wealth or consumption. For this reason, the Bank used a heterogeneous agent New Keynesian model to assess

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48 Technical details of the model-based evaluation of macroeconomic performance are broadly in line with those described in sections 3 and 4 in Dorich, Mendes and Zhang (2021). See also Swarbrick and Zhang (forthcoming).

49 Cognitive discounting effectively decreases the weights that agents place on events further in the future when making decisions today (Gabaix 2020).

the distributional effects of these frameworks (Djeutem, Reza and Zhang, forthcoming).[50] In the model, income inequality is linked to the output gap. This captures the tendency for a rise in inequality to occur during recessions. Djeutem, Reza and Zhang (forthcoming) find that highly history-dependent frameworks cause inequality to vary more widely throughout the business cycle.

Analyzing the financial stability implications of a monetary policy framework continues to be challenging. Researchers at the Bank and elsewhere are actively studying how to integrate financial vulnerabilities into macroeconomic models, but no single, best model has yet been developed. For this reason, the Bank relied on the existing literature to assess the financial stability implications of alternative frameworks. In addition, Bank staff looked at indicators from model simulations, such as the frequency and length of periods with very low interest rates that could fuel risk-taking behaviours.

Comparing the performance of alternative frameworks with flexible inflation targeting

Each of the alternative frameworks exhibits different strengths and weaknesses. **Table 2** summarizes the overall performance of these frameworks relative to a FIT framework, based on the model simulations, lab experiments and public consultations.[51] As shown in the table, no single framework was found to dominate across all relevant criteria, though some proved significantly more competitive than others. The performances of these frameworks are presented here, beginning with the two that proved most competitive relative to FIT—AIT and the dual mandate.

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[50] The model builds on Acharya and Dogra (2020) and Acharya, Challe and Dogra (2021).

[51] The results of model simulations reflect the assumptions and structure of the model in question.

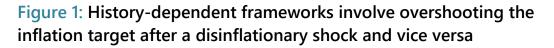**Table 2:** Summary of the performance of alternative frameworks compared with flexible inflation targeting

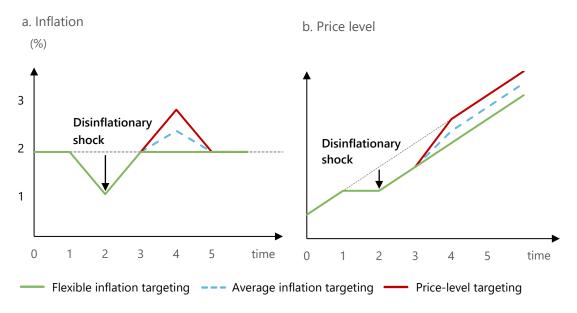|	Average inflation targeting	Dual mandate	Price-level targeting	NGDP-level targeting	NGDP-growth targeting
Price stability	Similar to FIT Supports inflation during ELB episodes	Similar to FIT Does not materially change the behaviour of inflation	Superior to FIT Stabilizes inflation better Keeps average inflation at 2 percent Provides certainty about the long-run price level	Slightly inferior to FIT Does not directly aim to stabilize prices, so performance depends on the evolution of trend output Relative-price shocks can lead to volatility in consumer prices even when the GDP deflator is stable	Inferior to FIT Substantially increases the volatility of inflation, largely because of poor stabilization of the real economy
Stability of real economy	Similar to FIT Supports activity during ELB episodes Can lead to greater volatility at other times	Similar to FIT Performs modestly better on employment Modestly greater volatility of the output gap	Inferior to FIT Leads to a substantial increase in unconditional volatility of output Supports activity during ELB episodes	Slightly inferior to FIT Leads to an increase in unconditional volatility of output Supports activity during ELB episodes	Inferior to FIT Responding to growth rate rather than level of real activity leads to a very substantial increase in unconditional volatility of output and employment
Financial stability	Slightly inferior to FIT Increases low-for-long tendency Reduces scope for discretionary departures from low for long	Similar to FIT Does not materially affect the frequency of episodes with persistently low interest rates	Inferior to FIT Greatly increases low-for-long tendency Reduces scope for discretionary departures from low for long	Similar to FIT Reduces tendency to cut interest rates in response to positive supply shocks Reduces scope for discretionary departures from low for long	Similar to FIT Reduces tendency to cut interest rates in response to positive supply shocks Increases macroeconomic volatility, which could trigger financial risks
Distributional implications	Similar to FIT Similar volatility of real economy leads to similar cyclical variation in inequality	Similar to FIT Similar volatility of real economy leads to similar cyclical variation in inequality	Inferior to FIT Greater volatility of real economy leads to more cyclical variation in inequality	Inferior to FIT Greater volatility of real economy leads to more cyclical variation in inequality	Inferior to FIT Greater volatility of real economy leads to more cyclical variation in inequality
Robustness	Similar to FIT Somewhat greater sensitivity to nature of expectations formation More robust performance in ELB episodes	Similar to FIT No material change in sensitivity to assumptions and shocks	Inferior to FIT Much greater sensitivity to nature of expectations formation	Inferior to FIT Much greater sensitivity to nature of expectations formation	Inferior to FIT Deterioration in performance in many situations, including recoveries from recessions
Understand-ability	Slightly inferior to FIT Multi-year average of inflation is understandable, but less familiar than year-over-year inflation	Inferior to FIT Having two objectives reduces clarity and simplicity Difficult to quantify employment objective	Inferior to FIT Price level is an unfamiliar concept to many Subjects in laboratory experiments found it difficult to forecast	Inferior to FIT Nominal GDP is an unfamiliar concept to many Subjects in laboratory experiments found it difficult to forecast	Inferior to FIT Nominal GDP is an unfamiliar concept to many Subjects in laboratory experiments found it difficult to forecast

Note: ELB is effective lower bound, FIT is flexible inflation targeting, and NGDP is nominal gross domestic product.

Average inflation targeting

Under AIT, the target is a multi-year average of consumer price index inflation. This report shows results for a three-year averaging period, but Bank staff studied several other averaging period durations. To return inflation to the multi-year average target, a period of below-target inflation must be followed by a period of above-target inflation, and vice versa (**Figure 1**).

The model simulation results suggest that the main benefit of AIT is that its embedded history dependence allows it to perform better than FIT at the ELB. For example, in ToTEM, the average output gap during ELB episodes is modestly narrower at -1.5 percent under AIT, compared with -1.7 percent under FIT. Similarly, average inflation during ELB episodes improves from 0.8 percent in FIT to 0.9 percent in AIT. Thus, when the policy rate is as low as it can go, AIT delivers slightly better outcomes for inflation and output.

Figure 1: History-dependent frameworks involve overshooting the inflation target after a disinflationary shock and vice versa

a. Inflation (%)

b. Price level

Flexible inflation targeting — Average inflation targeting — Price-level targeting

The principal difficulty with AIT is that, when not at the ELB, it can lead to volatility in the real economy. In particular, the need to follow periods of above-target inflation with periods of below-target inflation means that monetary policy would sometimes have to engineer a slowdown. In models with fully rational expectations, a short period of weakness is usually enough because price- and wage-setters anticipate the decline in future inflation and moderate their respective price and wage increases. In more realistic models

like ToTEM, price- and wage-setters are not entirely rational, so a more severe slowdown or recession may be needed to pull inflation down below target.

Employment–inflation dual mandate

A dual mandate has only a modest impact on employment outcomes compared with FIT. Under FIT, the health of the labour market is central to achieving the inflation target on a sustained basis. The model simulations capture this through the important role that labour market developments play in driving the output gap and wage growth.

In the Bank's laboratory experiments, the dual mandate performed the same as FIT and better than highly history-dependent alternatives such as PLT and NGDP-level targeting. This suggests that subjects in the experiments had a relatively good understanding of the dynamics under a dual mandate. However, many participants in the Bank's public consultations reported finding the dual mandate somewhat more difficult to understand than FIT. They also expressed concerns that a dual mandate could lead to higher inflation and the politicization of monetary policy (see **Box 7**). These concerns point to a risk that a dual mandate could detract from the clarity and simplicity of the FIT framework—two features that have led to a strong anchoring of inflation expectations. A de-anchoring of inflation expectations could lead to excessive volatility in output and employment.

Price-level targeting

PLT is an extreme version of AIT. The price level reflects the entire history of inflation, so targeting the price level is similar to targeting an infinite average of inflation. This ensures that inflation averages 2 percent over time. The high degree of history dependence means that PLT helps reduce the severity of ELB episodes.

But, for the same reasons as under AIT, these gains come at the cost of increased volatility in output and employment. The standard deviation of the output gap rises from 1.3 percent under FIT to 1.5 percent under PLT. This, in turn, implies more variation in inequality over the course of the business cycle. In addition, subjects in the laboratory experiments found it difficult to forecast in a PLT environment, and the heuristics they adopted led to destabilizing dynamics. On balance, the costs of PLT appear to outweigh the benefits.

NGDP-level targeting

NGDP-level targeting is modelled as stabilizing NGDP around a trend path. This framework has received renewed attention because of its potential to address some of the challenges of the current low interest rate environment (see, e.g., Ambler 2020). Like PLT, the high degree of history dependence inherent in NGDP-level targeting helps at the ELB but is destabilizing overall. This framework's macroeconomic performance is poorer than that of PLT because of several unique characteristics:

- Monetary policy's reactions to prices and output are forced to be equal (because NGDP is the product of the GDP price deflator and real output). This can result in inefficient responses to shocks.
- The framework implicitly reacts to output rather than the output gap, meaning that shifts in potential output can lead to persistent deviations of employment and output from their efficient levels. This can force adjustment through inflation, leading to inefficient relative price dispersion.
- Even when the framework stabilizes the GDP deflator, relative price shocks can still lead to volatility in consumer prices.

Overall, compared with FIT, NGDP-level targeting raises the volatility of inflation, the output gap and the policy rate.

A key practical advantage of NGDP-level targeting is that it avoids the need to estimate the unobservable level of potential output or maximum sustainable employment—monetary policy need only react to observed and forecasted NGDP. This, however, must be weighed against the fact that NGDP is measured imperfectly and revised over time. In addition, shifts in the trend growth rate of potential output would further undermine this framework's performance relative to the simulation results, partly because these shifts would exert persistent, growing impacts on the price level.

NGDP-level targeting also has implications for financial stability. By stabilizing nominal income, central banks can help improve the risk-sharing properties of non-contingent debt contracts, such as mortgages or vehicle loans, thereby improving financial stability outcomes (Sheedy 2014; Bullard and DiCecio 2019). This framework also has advantages when dealing with positive productivity shocks. Under NGDP-level targeting, the increase in output counterbalances the incentive to ease monetary policy stemming from lower prices. In contrast, under FIT, inflation and the output gap would both call for

lower rates after a positive productivity shock, potentially increasing the incentives for risk taking and debt accumulation. However, these benefits must be set against the need to return nominal income to some target path. This need can sometimes limit a central bank's ability to depart from a low-for-long policy even if the real economy has recovered and financial stability concerns have become more prominent.

NGDP-growth targeting

Targeting the growth rate of NGDP leads to very poor macroeconomic outcomes. This is due primarily to the performance of this framework in recoveries. After a recession, growth can be strong even though the level of output remains depressed. So, reacting to the growth rate of NGDP leads to premature tightening of monetary policy, which would cut short a recovery and stifle job growth.

Lessons from the horse race

Overall, the results of the horse race suggest that FIT, AIT and the dual mandate are likely to perform better than PLT and both types of NGDP targeting. This is consistent with the findings from the Bank's public consultations, where respondents viewed FIT, AIT and the dual mandate as the most promising frameworks.

While these three frameworks all perform relatively well in several ways, none dominates. Moreover, the differences in performance between these frameworks are small, suggesting that any gains from a change in framework would be modest. Nevertheless, two important lessons emerged from the horse race.

Lesson 1: Nearly all the benefits of average inflation targeting are at the effective lower bound

Under history-dependent frameworks like AIT, inflation is generally allowed to rise temporarily above the target after an ELB episode. The anticipation of the low-for-long policy rate required to generate this overshoot provides stimulus when it is needed most during the ELB episode. However, when not at the ELB, plausible departures from rational expectations, such as rule-of-thumb strategies, can make history-dependent frameworks destabilizing.

This raises the question of whether the benefits of history dependence could be captured at the ELB without adopting a new framework. One approach would be to use the type of state-contingent forward guidance analyzed by Mendes and Murchison (2014). While AIT involves a commitment about the path of inflation, a guidance-based approach would involve a commitment about the path of the policy rate. Such guidance can be implemented in many ways, so the details could be tailored to a given situation.

The Bank's response to the COVID-19 crisis provides an example of this type of guidance. The commitment to hold the policy rate at the ELB "until economic slack is absorbed so that the 2 percent inflation target is sustainably achieved" signalled the Bank's intention to maintain monetary policy stimulus longer than strictly required to achieve the inflation target. This approach uses the flexibility of the FIT framework to provide additional stimulus without committing to make up for past misses of the inflation target. Nevertheless, communicating and exercising such "patience" would qualitatively mimic some features of AIT. Analysis by Bank staff confirms that providing this type of state-contingent guidance whenever the policy rate reaches the ELB can deliver some of the key benefits of AIT (Chu and Zhang, forthcoming). This approach keeps average inflation closer to 2 percent and improves inflation, output and employment outcomes when the ELB is binding. Like AIT, this approach would result more often in inflation rising temporarily above the target after being below it for a period.

Lesson 2: A dual mandate only modestly affects employment

The economy's performance under a dual mandate is similar to that under the current FIT framework. Bank staff came to this conclusion using the standard assumption that the levels of both potential output and maximum sustainable employment are known to policy-makers. However, in reality, they are unknown and inherently uncertain. As discussed in Chapter 3, major ongoing structural changes to labour markets due to shifting demographics, globalization and technological change accentuate this uncertainty.

Incorporating this uncertainty and the learning process of policy-makers into the models used in the horse race is challenging. For this reason, Carter and Mendes (forthcoming) develop a simple model that captures key aspects of this learning process. One of their main findings is that the central bank tends to learn more about the true levels of potential output and maximum sustainable employment when the economy is operating above its productive

capacity. This is because during these periods, the sensitivity of inflation to economic activity tends to be relatively high, making inflation outcomes more informative.

This finding suggests that allowing the economy to temporarily operate above current estimates of its productive capacity can help policy-makers learn about the appropriateness of those estimates. By doing this, monetary policy is in effect probing for or seeking the maximum sustainable level of employment. Carter and Mendes (forthcoming) show that policy frameworks with this type of probing feature can yield some benefits. In particular, under certain circumstances it can reduce the uncertainty surrounding the true levels of potential output and maximum sustainable employment, which then contributes to improved macroeconomic outcomes. However, these benefits must be weighed against the costs. Probing may sometimes lead to inflation temporarily rising above the target and could contribute to de-anchoring inflation expectations.

Chapter 5: Overview of monetary policy tools

The Bank of Canada conducts monetary policy to achieve the objectives set out in its inflation-control agreement with the Government of Canada and has a number of monetary policy tools to do so.

The most commonly used is the policy rate, which influences the interest rates that financial institutions use to set borrowing costs for households and businesses. The Bank typically uses other tools only when the policy rate is at the effective lower bound (ELB). Several of these other tools are outlined in the Bank's *Framework for Conducting Monetary Policy at Low Interest Rates* (Bank of Canada 2015). They include extensions to how the Bank uses both the policy rate and its balance sheet to affect other key borrowing rates in the economy.

In Canada, the policy rate has fallen to the assessed ELB only twice, first during the 2008–09 global financial crisis and more recently during the COVID-19 pandemic (see Chapter 2). The Bank deployed additional tools during the pandemic (**Box 8**), in some cases for the first time. While central banks in several other jurisdictions have used a wider range of tools to provide stimulus on various occasions in recent decades, Canadians may be less familiar with some of these tools. But all of the Bank's monetary policy tools serve the same objective: to provide the appropriate degree of monetary stimulus in order to achieve the Bank's inflation target.

Box 8:

The Bank of Canada's response to the COVID-19 pandemic

In normal times, the Bank of Canada delivers or withdraws stimulus as needed by adjusting the policy rate. But the impact of the COVID-19 pandemic was unprecedented, and it called for extraordinary action.

The Bank took a range of swift and decisive actions to help mitigate the impact of the pandemic on the Canadian financial system and economy. Specifically, the Bank did this by:[52]

- launching liquidity facilities and programs to support the functioning of financial markets so that households, businesses and governments could continue to access credit (most of these facilities and programs were discontinued as market functioning improved)
- lowering the policy rate to 0.25 percent—the effective lower bound (ELB)—in March 2020 and, beginning in July 2020, using forward guidance to communicate that the policy rate would be maintained at the ELB until economic slack is absorbed so that the 2 percent inflation target is sustainably achieved
- using quantitative easing (QE) to supplement and reinforce the reductions in the policy rate and forward guidance by also helping keep longer-term borrowing rates low

Re-establishing market functioning

The Bank's first priority at the onset of the pandemic was to restore and maintain smooth functioning of the financial markets essential to Canadians. When widespread selling pressures caused liquidity to dry up sharply in multiple key funding markets, the Bank rolled out several new facilities. These facilities were effective in countering important strains and restoring well-functioning markets (Fontaine et al. 2020; Gravelle 2021a).[53]

For example, to bolster the capacity of commercial banks and other financial institutions to support businesses' short-term credit needs, the Bank launched a facility to buy bankers' acceptances. Spreads on bankers' acceptances over corresponding rates for overnight index swaps fell by 15 basis points on the day of the announcement and by up to 70 basis points over a longer period (Arora et al. 2020).

Other programs to support short-term funding markets included the Commercial Paper Purchase Program, which provided funding for a wide range of firms and financial institutions, and the Provincial Money Market Purchase Program.

The Bank also targeted market functioning through the Provincial Bond Purchase Program and Corporate Bond Purchase Program. These programs helped narrow spreads that had widened considerably in March 2020. Both programs were relatively small and were not considered a meaningful source of monetary stimulus. A year

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52 For more details on the Bank's actions during the pandemic, please see the Bank's website.

53 The Bank's purchases helped rebalance the lopsided trading flows in key debt markets, allowing buyers and sellers to set prices. Also, because securities dealers have limited room for risk on their own balance sheets, the Bank's purchases helped free up dealers' capacity to provide liquidity in these markets.

after they were introduced, both programs were allowed to expire on schedule. Debt markets had become fully functional again, with credit spreads for most borrowers either at or below pre-pandemic levels.

The Bank also started making large-scale purchases of Government of Canada (GoC) bonds in the secondary market through the Government of Canada Bond Purchase Program (GBPP). When the program was first launched, the purchases mostly helped improve liquidity, ensuring that the GoC bond market and, in turn, other debt markets could work smoothly (Fontaine, Ford and Walton 2020). Once the program was announced, yields on GoC bonds with less than three years to maturity fell by about 15 basis points, with the yield curve about 10 basis points lower on average (Arora et al. 2021).[54]

Scaling stimulus to the shock as appropriate

Once market stresses dissipated, the focus of the GBPP shifted from restoring market functioning to providing additional monetary policy stimulus—through quantitative easing—and reinforcing the messaging of the Bank's outcome-based forward guidance.

The Bank also stopped buying short-term GoC bonds because yields on those bonds were well anchored by forward guidance. Forward guidance and QE have been complementary throughout the pandemic, with forward guidance keeping shorter-term yields low and QE lowering yields of longer maturities.

By putting downward pressure on bond yields and lending rates throughout the financial system, forward guidance and QE lowered borrowing costs for households, businesses and governments.

Low borrowing costs and well-functioning financial markets helped businesses adjust to the pandemic and supported household spending. This positive experience has demonstrated that the Bank can use different monetary policy tools effectively to help stimulate demand even once the policy rate is at the ELB, and to help return inflation to the target sustainably. The Bank will continue to assess the impact of different monetary tools used to meet its mandate.

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[54] As well, in a daily purchase operation, $1 billion of GoC bond purchases caused an average decline in yields of about 0.8 basis points on purchased bonds—a decline of about 1.1 basis points in two-year and five-year operations, i.e., the flow effect. For additional details, see Arora et al. (2021).

Transmission channels

Adjustments to monetary policy reach different parts of the economy through five main transmission channels.

- **Interest rate channel**: Monetary policy tools work through this channel by affecting market interest rates and bond yields. It is sometimes called the credit channel.[55]
- **Exchange rate channel**: Changes to the level of interest rates or yields relative to those of other countries can affect the exchange rate.
- **Signalling channel**: Through the signalling channel, a central bank can influence expectations about future policy actions, thereby lowering longer-term rates and reducing uncertainty. The signalling channel can reinforce the interest rate channel.
- **Liquidity channel**: By purchasing financial assets, a central bank can make it easier for buyers and sellers to carry out transactions in markets. This helps ensure that the other transmission channels work as intended.
- **Portfolio balance channel**: By purchasing financial assets, central banks can affect the quantity and mix of financial assets available to investors. Changes to the available supply of assets, or to the amount of risk in the financial system, can lead to a repricing of those assets.

The state of the economy and financial system affects the strength of each channel and the impact of the policy tool being used (**Figure 2**). As well, the effectiveness of each channel depends on economic conditions and on the specific tool.

The size and structure of a country's economy are also key factors. For instance, in small open economies such as Canada, the exchange rate channel tends to be more important than it is for economies with large internal markets. At the same time, it also implies that interest rates further out the yield curve are heavily influenced by the global forces.

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[55] The credit channel can also involve how monetary policy affects the quantity of credit available, rather than the price.
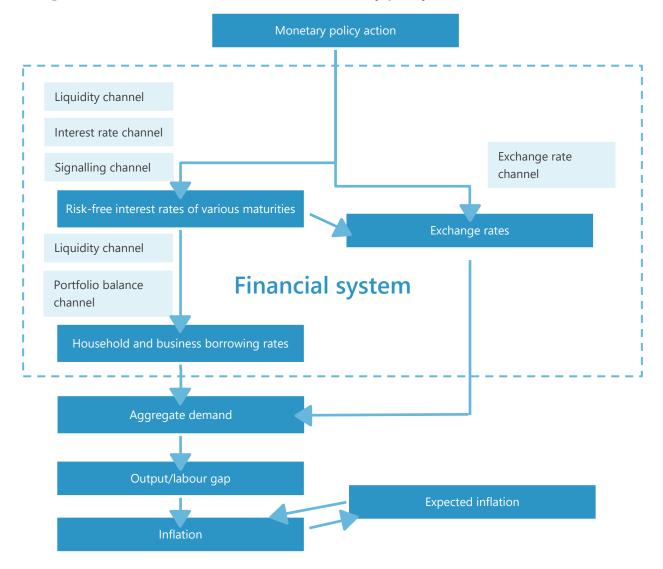
Figure 2: **The transmission channels of monetary policy**

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                        │   Monetary policy action     │
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    │             Inflation                │          └─────────────────────┘
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Monetary policy tools and how they work

When not constrained by the ELB, the Bank usually conducts monetary policy by raising, lowering or maintaining the policy rate. At the ELB, the Bank may deploy other tools to provide additional stimulus given that the policy rate cannot be lowered any further. With ELB episodes now more likely (see the discussion in Chapter 3 on lower neutral interest rates), other monetary policy tools will need to be used more often.

Some of these tools are extensions of the Bank's main approach to providing stimulus—the policy rate—while others work through the explicit use of central bank balance sheets.[56]

Extensions of the policy rate

When the policy rate is at the ELB and further stimulus is needed to meet the inflation objective, the Bank can go beyond its typical approach in two ways. The Bank can either maintain the rate but help set expectations that it will remain low for an extended period, or it can, on an exceptional basis, reduce the policy rate into negative territory.

Forward guidance involves conditional statements or commitments about the future path of policy rates. Central banks typically use these statements to indicate that policy rates will be held at the ELB for a longer period than historical patterns would suggest. Forward guidance can be purely calendar-based—referring to a specific month or year—or outcome-based (also known as state-contingent), often tied to the economic or inflation outlook. Outcome-based forward guidance can also be connected to calendar-based guidance through projections of when the economic outcomes are expected to be achieved. Forward guidance therefore works primarily through the signalling channel—affecting expectations and reducing uncertainty—and provides additional stimulus by lowering relatively short-term yields.

Nominal policy rates can be negative, but there are limits. For example, deposits will be converted to cash at some point. This is sometimes referred to as the switch-to-cash rate.[57] Lowering the policy rate below the switch-to-cash rate could impair financial markets, reducing the effectiveness of monetary policy actions.

Balance sheet tools

Using balance sheet tools—a broad category of measures—the central bank directly intervenes in financial markets to affect interest rates and borrowing costs for consumers and businesses. In this sense, these tools have a similar objective to that of the policy rate, but they may work through different channels. The most common balance sheet tools used for providing

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[56] See the Bank's guiding principles for central bank intervention for more information.

[57] Witmer and Yang (2016), for example, estimate that the switch-to-cash rate in Canada has been -50 basis points in the past. The switch-to-cash rate is a distinct concept from the reversal interest rate, which is the rate at which accommodative monetary policy becomes contractionary for lending (Brunnermeier and Koby 2018).

additional policy stimulus involve central banks' buying financial assets, usually sovereign government bonds. This increases the demand for the assets, pushing up their price and putting downward pressure on their yields. Because government bonds serve as the pricing benchmark for other debt, lower yields on government bonds translate into reduced borrowing costs, not just for governments but also for consumers and businesses.

Whether central banks are buying government or private sector debt, asset purchases provide stimulus through three features:

- the flow of purchases
- the total expected stock of purchases
- the composition of purchases

Quantitative easing (QE) involves the central bank buying longer-term government (or government-guaranteed) bonds. When conducting QE, central banks announce a target level of purchases—either a total amount or a pace (e.g., a target amount per week)—and the expected composition.

As noted, large regularly occurring government bond purchases provide stimulus by putting downward pressure on government bond yields. This helps lower borrowing costs across a range of securities through the interest rate channel because yields on government bonds serve as benchmark rates for other funding markets. When these markets are working well, QE works similarly to changes in the policy rate, although QE's main effects are on longer-term interest rates. QE also works through the portfolio balance channel because central bank purchases reduce the relative amount of government bonds available for investors to buy. This causes them to reallocate their holdings toward riskier debt. If these actions spur reallocation across global portfolios, effects may occur through the exchange rate channel as well.

During periods of financial stress, government bond purchases can also help repair the liquidity channel, making it easier for buyers and sellers to conduct transactions because the central bank acts as a price-insensitive buyer.[58]

Increases in settlement balances (or central bank reserves) fund these purchases. Settlement balances are interest-bearing central bank liabilities, and when they increase as a result of QE, these increases are not permanent.

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[58] In some cases, central banks may also purchase sub-sovereign government debt as part of a QE program. However, this is more typically aimed at restoring liquidity if these markets are impaired.

This temporary feature clearly distinguishes QE from monetization of government debt.[59]

Yield curve targeting is similar to QE and works through the same channels, but it focuses directly on the level of bond yields rather than on the quantity of purchases. The central bank announces a target level for a specific yield, typically at the middle of the yield curve, and stands ready to purchase sufficient bonds to achieve that target level.

Credit easing involves purchases of non-government debt, such as corporate bonds. These purchases reduce borrowing rates for those who rely on market-based financing, which are typically priced at a spread over the yield of a government bond of the same maturity. During a crisis period, purchasing these bonds eases borrowing costs by repairing the liquidity channel.

Credit easing can also provide stimulus through the portfolio balance and exchange rate channels, similar to how QE provides stimulus through those respective channels.

Collateralized lending provides financial institutions an opportunity to lock in liquidity over the medium term, typically a one- to three-year horizon. Examples include fixed-rate longer-term repurchase agreements (repos) conducted at the policy rate. These programs help reinforce forward guidance through the liquidity and signalling channels.[60]

Funding for lending involves central bank provision of funding to commercial banks at below-market rates, contingent on the banks increasing lending to targeted borrowers. Typically aimed at small and medium-sized businesses who rely heavily on bank financing, funding for lending programs work primarily through the interest rate channel. Examples of such programs include the targeted longer-term refinancing operations conducted by the European Central Bank and the Bank of England's Term Funding Scheme with additional incentives for small or medium-sized businesses.

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[59] Beaudry (2020b) offers a more comprehensive description of the Bank's QE program. An explainer entitled "Understanding Quantitative Easing" is also available on the Bank's website.

[60] The Bank of Canada used term repos to reinforce its conditional commitment in April 2009, when it conducted 6- and 12-month term repos at the target rate.

Effectiveness of monetary policy tools

Changes to the policy rate are acknowledged as the most effective and best understood policy tool. The presence of an ELB, however, means that central banks may need other tools when the policy rate cannot be lowered further and additional monetary stimulus is needed. These tools are not perfect substitutes for changes to the policy rate—their impact on economic activity is less well understood. Nevertheless, evidence suggests that all of the monetary policy tools discussed above can be effective in easing financial conditions, which stimulates total demand and helps return inflation to target.

Monetary policy tools will be more effective if they are well understood—and, as much as possible, accepted—by the public. Almost three-quarters of respondents to a Bank consultation said they would not support the Bank using negative interest rates (Bank of Canada 2021). Participants were more in favour of the Bank using other tools: most indicated they support the Bank's QE program, and about two-thirds indicated support for forward guidance.

Johnson et al. (2020) provide an extensive literature review on which tools work best and when.

Some key takeaways:

- Forward guidance commitments have proven to be effective at providing additional easing by lowering shorter-term yields.
- Balance sheet tools such as QE and yield curve targeting appear to be useful complements to forward guidance. All three mitigate negative macroeconomic shocks by lowering medium- and longer-term yields.
- Credit easing and funding for lending are more targeted tools that have been used effectively to restore market functioning in the financial system and to increase access to credit.
- Central banks in some jurisdictions have provided additional monetary stimulus by lowering policy rates into negative territory. Empirical evidence, however, suggests that policy rate reductions become progressively less stimulative—even when rates are still slightly above zero—and may even reach a point where they become contractionary.

As noted above, the size and structure of an economy can affect how effective each tool is in a given situation. In small open economies such as Canada, QE affects both the level of domestic yields relative to global yields as well as exchange rates. In addition, when faced with a global shock, small open

economies may also be affected by the policy actions that their larger trading partners take. For example, when the US Federal Reserve conducts QE, global term premiums decline, resulting in lower term premiums on Government of Canada bonds as well.

The health of the financial system matters. Certain tools have their greatest impact when markets are impaired because part of what they do is improve market functioning. But the structure of the financial system and relative importance of different types of financial intermediaries also matter. For example, purchases of private sector assets such as corporate bonds are more likely to work better in jurisdictions where businesses tend to fund themselves in markets and where financial assets are held as a source of wealth. Similarly, jurisdictions that rely more on bank-based lending may benefit more from programs such as funding for lending, which aim to stimulate demand by giving banks incentive to make certain loans.

The role of other public financial institutions can be important for the effectiveness of different tools while other non-monetary policy actions are being taken. In Canada, Export Development Canada (EDC) and Business Development Canada (BDC) are well-established Crown corporations that provide funding to domestically based exporters and to small and medium-sized businesses, respectively.[61] The federal government has used EDC and BDC during crises to provide low-cost funding directly to businesses. So, the impact of a funding for lending program in Canada could be much lower than in countries that lack similar institutions.

In addition, some non-monetary policy actions can complement and reinforce certain monetary policy tools, increasing overall effectiveness of economic support policies.[62] For example, easing microprudential policies can facilitate the portfolio balance channel of asset purchase programs (see Basel Committee on Banking Supervision 2021).

Taking all of this context into account is important when assessing the tools' ultimate impact. Moreover, multiple tools might be used at the same time,

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[61] Another key Canadian public financial institution is the Farm Credit Corporation, which provides financial services to farms and other agricultural operations in Canada.

[62] The effectiveness of other policies can also depend on monetary policy actions. For instance, simulations of structural macroeconomic models suggest that fiscal multipliers are larger when monetary policy holds rates flat at the ELB (De Resende, Lalonde and Snudden 2010). Miyamoto, Nguyen and Sergeyev (2018) and Ramey and Zubairy (2018) provide supporting empirical evidence for Japan and the United States, respectively.

working through overlapping channels. So, the interactions among them must also be considered when assessing the effectiveness of any one tool.

While academic discussion of balance sheet tools tends to focus on the size of purchases and its impact on yields, looking at operational considerations is also important. For instance, as asset purchases expand central banks' balance sheets, they also increase the central bank's exposure to financial losses. Appropriate policies governing the capacity for the central bank to absorb financial losses, such as larger capital levels or financial reserves, are therefore needed to support the credibility of asset purchase programs.[63] This provides the central bank with a level of financial independence that helps support its delegated operational independence to meet its inflation-targeting mandate. And, to offset market functioning risks associated with a scarcity of some assets in the market, securities lending and repo operations usually need to be expanded to make the central bank's asset holdings more readily available to private investors.

Because monetary policy works to stimulate the economy by influencing interest rates and asset prices, some analysts in Canada and elsewhere have questioned whether some policy actions may also increase inequality. Reductions in the level of interest rates and use of other monetary policy tools can boost wealth by increasing the value of assets, such as the investments that Canadians have in their registered retirement savings plans or company pension plans. Given that these assets are not distributed evenly across society, monetary policy can sometimes widen wealth inequality. Still, by reducing cyclical swings in growth and employment, monetary policy actions can help reduce income inequality, mainly by supporting a healthier labour market that creates more jobs (Macklem 2012; 2021). The effects of monetary policy actions on individual households can vary considerably, though (**Box 9**). The Bank will continue to work to more fully understand the impact of the policy rate as well as other monetary policy tools, such as QE, on both income and wealth inequality in Canada.

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[63] See, for example, Stella (1997).

Box 9:

Monetary policy and inequality

Before the 2008–09 global financial crisis, considerations related to inequality were not at the forefront of the analysis of monetary policy. Distributional effects across industries, income groups and occupations generally received less weight because changes to the policy rate were seen as having broad effects on the whole economy. Indeed, uneven effects that might have resulted from easing would typically be reversed by the subsequent tightening.

In the years since the 2008–09 global financial crisis, though, there has been greater emphasis on how monetary policy can affect inequality.[64] Countercyclical monetary policy can help limit job losses and reduce the depth and duration of periods of economic weakness. And, in doing so, monetary policy can reduce labour income inequality to the extent that long periods of unemployment, especially for less-skilled or low-wage workers, can have lasting effects on earning potential. Reaching maximum sustainable employment is consistent with inflation targeting because inflation can be kept on target sustainably only after excess capacity in the economy, including in the labour market, has been absorbed.

Monetary policy's impact on wealth inequality is more complicated. The long-standing argument that monetary policy is neutral when evaluated over an entire business cycle is harder to make when, as has been the case in many jurisdictions, policy rates are kept close to their lower bound for several years. In addition, credit easing—which has been used extensively as an ELB tool by central banks outside Canada—is often perceived as tilted to benefit specific sectors.

Generally, monetary policy tools are blunt instruments that have broad effects. Nevertheless, considering the transmission channels that policy tools work through is important when evaluating potential differences in their effects on various segments of the economy.

For instance, a change in interest rates has different effects on:

- savers versus borrowers
- those with existing debt versus those taking on new debt
- those with savings in assets such as housing, bonds and equities versus those with savings accounts at banks and other financial institutions

This is true regardless of whether the change in interest rates is caused by a change to the policy rate, forward guidance or balance sheet tools, although the latter may

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[64] In previous renewals, the Bank examined the redistributive effects of different levels of steady-state inflation (Bank of Canada 2011) and those arising from a transition between steady-state inflation rates (Bank of Canada 2015). This analysis found that changes in inflation can have significant redistributive effects across different age, income and wealth groups.

have greater effects on targeted asset classes. In addition, whatever the tool, the effects depend on the actual and perceived length of the change in interest rates—or of asset purchases or other balance sheet or policy actions—and on whether savers and borrowers face fixed or variable interest rates.

As well, some effects are almost instantaneous, while others are delayed. A large proportion of consumer interest rates—for example, on mortgages, vehicle loans and credit cards—are fixed. In these cases, it may take some time for existing borrowers to see any benefit from a reduction in the policy rate, for instance. Similarly, the nature of a savings product affects how much a saver benefits (or suffers) from a change in the policy rate. Those with fixed-rate products could see little impact, while those with variable-rate products or riskier assets may see more of an immediate gain or loss.

The longer rates are expected to remain low, the larger the potential impact on the prices of assets such as bonds, equities or housing. The impact on housing prices, in particular, is often largely driven by the fact that demand for housing goes up whenever borrowing costs go down. An initial outsized gain in house prices could fuel expectations that such outsized gains will continue indefinitely, spurring investor and speculative demand. But since more houses can be built, the impact on house prices from low rates ultimately depends on how long the elevated demand lasts, what is driving it and how long it takes to boost supply.

Monetary policy—through both changes to the policy rate and the use of balance sheet tools—is therefore more likely to directly affect the wealth of those who already have savings invested in bonds, equities and housing. While the easing and tightening stages of the policy cycle may offset each other over time, the prolonged period of low interest rates since the 2008–09 global financial crisis has led many to see monetary policy as tilted toward asset holders and, as such, contributing to an increase in wealth inequality. In contrast, the positive impact on jobs and income inequality is less direct and can be harder to observe. This makes the overall impact on individuals hard to determine given the differences in how Canadians accumulate and manage their savings.

Choosing tools and sequencing their use

The Bank applies tools in ways that are best suited to the nature of the economic or financial shock. For example, academic literature and historical experience suggest a baseline sequence for providing monetary stimulus to respond to a negative shock to aggregate demand. Assuming that financial markets are not impaired, a likely sequencing of policy would be the following:

- Lower the policy rate, including to the ELB if economic and financial conditions warrant it.
- Once at the ELB, use forward guidance to influence market expectations and reduce uncertainty.
- Proceed with QE, if needed, to reinforce the forward guidance and provide additional stimulus.
- Proceed with credit easing if further monetary policy stimulus is needed.

The larger the desired policy response, the quicker the central bank will implement the different tools. For example, for a sufficiently large shock, forward guidance and QE could be rolled out at the same time as the policy rate is lowered to the ELB.[65]

The baseline sequence above will not always be appropriate and therefore is not predetermined. In any scenario where multiple monetary policy tools may be needed, the context—including how a crisis evolves and any challenges to the recovery—influences the sequencing. Assuming the policy rate is at the ELB, and given that the effectiveness of any given tool depends on the context, the Bank considers the following when deciding what to use and when:

- the size, duration and nature of the shock
- the health of the Canadian and international financial systems
- the amount of additional monetary policy easing needed and existing policy space for each tool
- how a tool would complement and interact with other monetary policy tools as well as with other domestic and international policies
- implications for financial system vulnerabilities

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[65] Zhang et al. (2021) find that the policy mix that delivers the best outcome for the Canadian economy calls for immediately implementing forward guidance and QE, followed by credit easing when containment measures are lifted.

- a communications strategy that provides different levels of detail for different audiences and considers public acceptance of, and reputational risk related to, the use of a given tool
- considerations around adjustments to programs once they have been implemented

If the transmission channels are not functioning well, monetary policy will have less or even no impact. Central banks can therefore use balance sheet tools to improve market functioning and help restore the transmission mechanism. When used for these purposes, pricing of these tools is structured to serve in a backstop capacity—that is, they are only attractive to market participants when markets are under stress. As conditions improve, using them becomes relatively more expensive, so demand for them wanes.

However, when balance sheet tools are used explicitly to provide monetary stimulus, programs are designed, scaled and calibrated to achieve the monetary policy objective (i.e., the inflation target). Unlike backstop pricing used for market functioning operations, the use of balance sheet tools for monetary stimulus includes the explicit intention to influence market interest rates. Central banks announce the size and composition of their intended asset purchases, and transactions take place at prices determined in financial markets. Decisions to adjust program details—such as expanding or reducing a program's size—are part of the monetary policy decision-making process. Programs continue until the policy objective is achieved.

How tools interact with each other is important when considering how to sequence them. As noted earlier, QE and yield curve targeting both complement forward guidance, so the use and calibration of either can be considered alongside forward guidance. For example, forward guidance and QE can be combined to put downward pressure on yields across the curve because each tool affects different maturities. In the case of yield curve targeting, date-based forward guidance can be aligned with the term of the yield that is being targeted. In contrast, pairing yield curve targeting with outcome-based forward guidance poses communication challenges because the targeted yield may arrive before the targeted economic outcome, or vice versa.

Normalization

Ultimately, monetary policy is countercyclical. Just as central banks add stimulus when total demand is weak, less stimulus is needed as the economy improves. This has been the approach to conducting monetary policy with the policy rate. However, central banks have less experience with reducing or unwinding the stimulus provided using balance sheet tools such as quantitative easing.

When unwinding this stimulus, central banks need to take deliberate policy actions that are guided by the economic outlook and monetary policy objectives—particularly the inflation outlook—but in a way that also maintains well-functioning markets. Economic and financial conditions and the inflation outlook influence decisions about:

- when and how to slow the pace of purchases
- how long to maintain a stable amount of asset holdings
- when and how quickly to unwind the monetary stimulus
- the long-run level and composition of the balance sheet

The normalization phase is unlikely to follow the same path as the stimulus phase. Normalization will likely be a more gradual process than adding stimulus. As well, the policy tools used would not necessarily be unwound in the reverse sequence of how they were implemented.

In general, as the economic outlook improves and less additional stimulus is warranted, central banks will proceed in gradual and measured phases. One likely sequence for a central bank that is using QE would start with maintaining the policy rate at the ELB while gradually reducing the incremental amount of its asset purchases.[66]

As the recovery progresses, the central bank will eventually decide conditions no longer warrant adding any additional stimulus through QE. Over this period, it would purchase new bonds only with proceeds from maturing bonds, thereby keeping the overall holdings of bonds on the balance sheet constant. This is known as the reinvestment phase—it ensures that the amount of stimulus remains the same over a period.

Once conditions warrant reducing the amount of monetary policy stimulus, a central bank would likely begin by lifting its policy rate from the ELB.

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[66] A central bank would typically not lift the policy rate from the ELB while continuing to increase its asset holdings.

To further reduce the stimulus in the system, the central bank could allow maturing assets to roll off its balance sheet. Or, for a more aggressive approach, it could actively shrink the balance sheet by selling the assets.

Bottom line

Central banks are increasingly using a broad range of policy tools to achieve monetary policy objectives and will likely have to continue to do so because of the low global neutral interest rate environment.

Choosing the appropriate tools and determining the sequence of their use requires careful consideration. In particular, central banks will need to assess the context, including:

- the nature of the shocks that they are responding to
- how well the various monetary policy transmission channels are working
- what synergies among tools would be most effective in a given set of circumstances

Fundamentally, though, monetary policy is intended to be countercyclical. As the economy improves, less monetary stimulus will be needed to meet the inflation objective. Just as with the initiation of various tools, actions to unwind these tools will be guided by the economic outlook in order to achieve the inflation target.

Chapter 6: Strengthening the conduct of monetary policy

Since 1991, monetary policy has operated within a flexible inflation-targeting (FIT) framework. Over the past 30 years, both the framework and the implementation of monetary policy have evolved to respond to structural changes in the global and Canadian economies and to the evolution of economic thinking. The flexibility inherent in the framework has allowed for this evolution while keeping inflation low and stable and maintaining well-anchored inflation expectations. In addition, monetary policy has made an important contribution to the overall resilience of the Canadian economy.

Both the 2008–09 global financial crisis and the COVID-19 pandemic had a significant impact on the global economy and financial system. And major trends such as shifting demographics, new digital technologies and climate change are altering the economic landscape. As discussed in Chapter 3, two developments are particularly relevant to the conduct of monetary policy:

- Neutral interest rates are lower than in the past and are likely to remain low. Consequently, central banks will have less room to lower the policy rate in the face of big negative shocks to the economy. As a result, they will need to use other monetary policy tools more often. Otherwise, prolonged periods with the policy rate at the effective lower bound (ELB) could result in inflation remaining below 2 percent.
- Shifting demographics, technological change, globalization and shifts in the nature of work have had profound effects on the Canadian labour market. These forces have made it harder to gauge the level of maximum sustainable employment, which is the highest level of employment that the economy can sustain before inflationary pressures build. In addition, there is an observed weakness in the relationship between economic slack and inflation, which has become more evident as inflation expectations have become more firmly anchored.

Addressing these two challenges requires increased clarity in how the Bank of Canada conducts monetary policy within the FIT framework.

Targeting 2 percent inflation

Canada's monetary policy framework will continue to target 2 percent inflation—as measured by the 12-month rate of change in the consumer price index—within the 1 to 3 percent control range. The analysis conducted as part of this review reinforces that low and stable inflation remains the appropriate target for monetary policy. The historical success in keeping inflation low and stable provides valuable credibility, which helps to anchor medium-term inflation expectations. In addition, as public consultations demonstrated, FIT is straightforward to communicate and easy to understand compared with alternative monetary policy frameworks.

This review included a broad range of analysis and research as well as consultations with other central banks, the economics community, stakeholder groups and the public. Although the Bank's horse race (see Chapter 4) and consultations compared alternative monetary policy frameworks from different perspectives, both concluded that FIT remains the best framework across a range of criteria.

Feedback from the consultations demonstrated that Canadians value low and stable inflation and that, of all the frameworks, they understand FIT the best. Many Canadians said they want the Bank to contribute to making the economy more inclusive, but they recognize that several non-monetary forces affect employment and economic inclusion and that monetary policy can play only a supporting role.

Building on the success of FIT by incorporating the potential benefits of other frameworks in certain circumstances, the Bank will continue to leverage the flexibility of the 1 to 3 percent inflation-control range. The goal remains to manage the trade-off between current and future risks to the inflation target effectively and to return inflation sustainably to target within a reasonable time frame.

Using the flexibility of the inflation-control range and other tools

The Bank will continue to make use of the flexibility of the 1 to 3 percent inflation-control range, along with a broader set of tools, to help address the challenges of structurally low interest rates. Given low global interest rates, the policy rate will likely hit its ELB more often, and, in response, the Bank may

hold the policy rate at the ELB for an extended period. The Bank can be patient—holding rates low for longer after an ELB episode—if it assesses that this will help return inflation sustainably to target within a reasonable time frame.

During ELB episodes, the Bank will also need to use a broader range of monetary policy tools more regularly to support demand and employment and to achieve the inflation target. These include forward guidance and balance sheet tools such as large-scale asset purchases (quantitative easing and credit easing).[67] While experience using these tools is limited, the evidence indicates that they effectively provide additional stimulus. However, they are not perfect substitutes for lowering the policy rate. Thus, the ELB still represents a constraint to providing sufficient monetary stimulus when needed.

Chapter 4 notes that patience at the ELB combined with state-contingent forward guidance can provide similar benefits to frameworks that depend on history, such as average inflation targeting, without committing to making up for past misses of the inflation target. At the ELB, the Bank's policy rate cannot be lowered further to stimulate additional demand. However, since many loans (e.g., vehicle loans and mortgages) are based on long-term rates, the Bank's commitment to holding the policy rate low for a prolonged period can lower the rates at which consumers and firms borrow. This can stimulate demand and help support a quicker recovery in employment and output.

By design, a low-for-longer policy rate increases the likelihood that inflation could modestly and temporarily overshoot the 2 percent midpoint of the inflation-control range as the economy recovers. A commitment to holding rates low for longer means that monetary policy will likely begin tightening only after inflationary pressures begin to build. The benefit is that the additional stimulus can shorten the period during which inflation remains below target. Thus, this policy can help keep inflation and inflation expectations close to 2 percent.

While patience—implemented through forward guidance—is a core element of the response during an ELB episode, the use of other monetary policy tools may be appropriate in some circumstances. To support the effective use of

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[67] In rare circumstances, the Bank may also use yield curve control, funding for lending and negative interest rates (see Chapter 5).

these tools, the Bank will work with the Department of Finance Canada to establish a framework that gives the Bank sufficient financial capacity to manage its balance sheet to support the economy after adverse shocks and achieve the inflation target.

Seeking maximum sustainable employment

When circumstances warrant, the Bank will refrain from raising rates pre-emptively as inflation is approaching the 2 percent target. This will help the Bank better assess the current level of maximum sustainable employment. Reaching maximum sustainable employment is necessary for inflation to remain on target, and achieving the inflation target is needed to sustain maximum employment. The Bank will consider a broad set of labour market and inflation indicators to guide its actions. It will not set a fixed target for maximum sustainable employment because the precise level is unknown and evolves over time.

Central banks have long recognized that the level of maximum sustainable employment is unknown and time varying.[68] As discussed in Chapter 3, ongoing structural changes to labour markets as a result of non-monetary factors, such as globalization and digitalization, have accentuated this uncertainty. Given the relative flatness of the Phillips curve, inflation is now less likely to provide a clear signal when employment falls short of its maximum level. As a result, when it is beneficial to do so, the Bank may choose to actively seek, and continuously update its estimates of, maximum sustainable employment.

To seek maximum employment, the Bank may sometimes tighten its monetary policy stance more gradually than it would have in the past when inflation is near the 2 percent target and employment is near the Bank's current estimate of the maximum sustainable level. Such a policy is often referred to as probing, and it can allow employment to rise above the Bank's current estimate of its maximum sustainable level as long as inflation remains near the midpoint of the inflation-control range and the Bank does not see clear evidence of rapidly building inflationary pressures.

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[68] One reason many central banks—even those with a dual mandate—do not have a numerical target for employment is because accurately identifying the level of maximum sustainable employment is impossible. This level is largely determined by non-monetary factors that affect the structure of labour markets and cause fluctuations in employment. As a result, the level may vary over time in response to changing economic forces.

With probing, inflation might temporarily rise above the 2 percent target if the level of maximum employment has not increased. This risk is offset by the value of learning when the current estimate of maximum employment is too low. Probing will also lower the likelihood of inflation remaining below 2 percent for extended periods.

Patience and probing will leverage the flexibility and credibility of the framework to help manage uncertainty. The potential benefits of patience and probing will need to be balanced against the risk that maximum sustainable employment is lower than thought, which would lead to a larger overshoot in inflation than projected. This cost-benefit calculation will depend on the inflation context and economic conditions.

Maintaining well-anchored inflation expectations

Keeping medium-term inflation expectations anchored at 2 percent is essential to maintaining the effectiveness of monetary policy. Combined with low and stable inflation, well-anchored medium-term expectations help provide Canadians with a stable environment in which to make long-term saving and investment decisions. Moreover, when inflation expectations remain well anchored, the framework has the flexibility to return inflation to target over an appropriate time horizon. Since 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.

Although patience and probing have distinct aims—to help manage the ELB constraint and identify the maximum level of employment, respectively—they are complementary. Both imply that inflation should sometimes be allowed to temporarily and modestly overshoot the 2 percent target. By allowing such overshoots, both practices would help offset the downward bias of inflation associated with the ELB and keep inflation closer to 2 percent on average. This, in turn, should help reduce the risk of de-anchoring inflation expectations downward if ELB episodes become more frequent.

The use of the flexibility provided by the inflation-control range does not imply that the Bank has adopted so-called makeup strategies that pursue a period of above-target inflation after a period of below-target inflation. While patience and probing may result in modest and temporary overshoots of the inflation target, these overshoots may not happen if the productive capacity

of the economy is larger than assumed. Thus, this approach to using the flexibility of the inflation-control range differs from a policy of committing to systematically pursuing above-target inflation for a prolonged period.

A patient approach of maintaining low rates when there is heightened uncertainty over the level of maximum sustainable employment can help the Bank achieve its inflation target; however, this approach poses implementation challenges. If the Bank were to respond too late to a period of accelerating inflation in the presence of a flat Phillips curve, the output cost of reversing an increase in inflation expectations could be substantial. In addition, if the Bank were to repeatedly respond too late to growing inflationary pressures, inflation expectations could become de-anchored and drift upward.[69]

As part of its approach, the Bank will develop a dashboard that includes a range of indicators of labour market performance.[70] The Bank will carefully monitor, assess and refine these and other indicators of inflationary pressures over the coming years.

Assessing financial vulnerabilities

The Bank will continue to assess financial system vulnerabilities, recognizing that a low interest rate environment with high levels of debt can lead to financial imbalances. A variety of microprudential, macroprudential and housing policy tools are better suited to address these financial vulnerabilities than monetary policy is. The recent experience with macroprudential policy in Canada, particularly in housing finance, suggests that well-designed policy tools can mitigate financial vulnerabilities and reduce systemic risk in the financial system (see Chapter 3). The Bank will continue to work with the Department of Finance Canada and other relevant regulatory agencies to ensure that Canadian arrangements for financial regulation and supervision remain fit for purpose.

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[69] The Bank remains mindful of lessons from history in the conduct of monetary policy, particularly the experience of the Great Inflation from 1965 to 1982. Economists continue to debate the factors behind the sustained rise in inflation in the 1970s, but they agree that central bank policy played a key role. This episode clearly demonstrated that there is no long-run trade-off between lower unemployment rates and higher inflation (e.g., Bryan 2013). Another enduring insight is the importance of well-anchored inflation expectations, as shifting expectations contributed to the Great Inflation and the subsequent cost of lowering inflation (e.g., Solow 1979).

[70] Ens et al. (2021) outline a preliminary approach to a range of labour market indicators to help guide monetary policy.

Nevertheless, the Bank will remain mindful that monetary policy could exacerbate financial vulnerabilities. Elevated financial vulnerabilities and possible episodes of financial stress could eventually lead to worse economic outcomes. This intertemporal trade-off poses a challenge for monetary policy because it may make it harder to achieve the inflation target in the future.[71]

The Bank has made important strides in incorporating issues related to financial vulnerabilities into its discussion of monetary policy. It will continue to refine and improve its understanding of these issues in line with the Bank's risk management approach to the conduct of monetary policy outlined in the 2016 renewal.[72] This approach aims to more effectively manage the trade-off between risks to the inflation target now and those in the future.

Building capacity to assess the impact of climate change

Climate change poses substantial risks to the global and Canadian economies. While monetary policy cannot directly tackle the threats posed by climate change, the Bank will take into account the important effects of climate change on the Canadian economy and financial system and will work with international and Canadian partners to mitigate climate-related financial risks. To conduct monetary policy effectively, the Bank must understand the potential impacts of climate change on the macroeconomy, inflation and jobs. Climate change is also highly relevant to the Bank's mandate to foster a stable and efficient financial system. To address climate change consistent with its mandate, the Bank will:

- advance the development of its modelling tools and conduct further research to better understand and assess the macroeconomic implications of climate change
- review its operational framework for monetary policy with a view to including climate change considerations where appropriate
- assess the risks that climate change poses by supporting the identification of risk exposures, promoting best practices in climate risk disclosure and

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[71] See Beaudry (2020a).

[72] See Bank of Canada (2016).

management for the financial sector, and enabling efficient pricing of climate-related risks in the market

Enhancing communications

Monetary policy works best when it is well understood and the reasons behind decisions are clearly explained. Through the years, the Bank **has sought to** become more transparent in communicating its goals and explaining its conduct of monetary policy (**Box 10**). With these important changes to the implementation of monetary policy, the Bank will communicate clearly when and why it is making use of the flexibility of the 1 to 3 percent inflation-control range.

Box 10:

Evolving communications, increased transparency

Over the past 30 years, central banks, including the Bank of Canada, have moved from communicating very little about their policies and actions to progressively increasing transparency (Poloz 2018). These efforts have enhanced the credibility and effectiveness of monetary policy actions by guiding expectations, and they have fostered greater accountability and public trust in the central bank.

The advent of inflation targeting in 1991 provided a clear objective for monetary policy and gave the public a straightforward way to measure the performance of their central bank over time. Since then, the Bank has implemented a series of communications initiatives to:

- demonstrate its accountability
- explain its economic projections and policy decisions
- provide open access to staff research and data
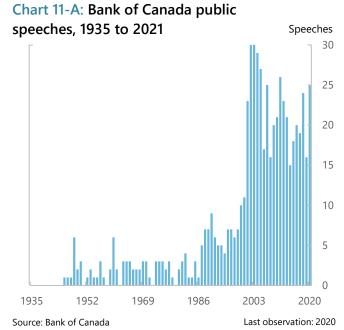- include insights from businesses, financial markets and consumers in the policy process

Notable initial measures include:

- publishing the Bank's forecasts for the economy and inflation in the *Monetary Policy Report* (MPR)
- establishing regional offices to act as the Bank's representatives with stakeholders across the country
- appearing regularly before parliamentary committees to explain the Bank's policy decisions
- introducing eight fixed announcement dates for interest rate decisions, accompanied by a press release explaining the decision

- establishing a formal and regular monetary policy framework renewal process, with a clear and public research agenda

Over the past three decades, the number of speeches and media activities by Governing Council members has increased significantly (**Chart 11-A**). These speeches provide the public with greater insight into the Bank's thinking on the economy.

More recently, the Bank expanded the content of the opening statements for the MPR and introduced speeches presenting an economic progress report after policy decisions not accompanied by an MPR. These changes provide greater insight into Governing Council's policy deliberations.

Chart 11-A: Bank of Canada public speeches, 1935 to 2021

Source: Bank of Canada   Last observation: 2020

Input from businesses, financial markets and consumers has played a greater role in the decision-making and communications process through the Business Outlook Survey, the Senior Loan Officer Survey and, more recently, the Canadian Survey of Consumer Expectations.

The Bank also now regularly publishes staff research and analysis that feed into the policy-making and forecasting processes, including staff projections with a time lag. In addition, where possible, the Bank provides open access to its data and models (Wilkins 2015).

The Bank has also expanded the range of stakeholders it engages with, putting in place a dedicated stakeholder relations function and strategy to guide its efforts (Macklem 2020). Overall, the Bank has sought to better understand the information needs of its various audiences. Accordingly, it has expanded its digital and social media presence to offer content accessible to anyone interested in gaining a better understanding of the economy and the Bank's role.

When the COVID-19 pandemic struck, the Bank responded with unprecedented policy actions. The Bank's communications focused on helping Canadians understand the new tools the Bank used, such as quantitative easing, and how they contributed to supporting the economic recovery. The Bank placed a premium on

further enhancing the relatability of its communications and ensuring maximum transparency by communicating proactively through multiple channels.

During an ELB episode, the Bank will likely use forward guidance on the expected path of the policy rate. It will continue to be clear about the rationale for the forward guidance it provides. In these cases, the anticipated impact on inflation will be reflected within the Bank's published forecasts.

A key input for determining the appropriate path for monetary policy is the Bank's assessment of the output gap. Employment is the most important element in this assessment, but its importance has not been emphasized consistently in past communications. Moving forward, the Bank will systematically report to Canadians on the role played by labour market outcomes in the assessment of the output gap and forecasts of inflation. This will include more extensive reporting on a broad set of labour market indicators and how they factor into its monetary policy decisions.

By helping to achieve maximum sustainable employment, monetary policy contributes to a more inclusive economy that provides opportunities for Canadians to participate in the labour market. However, monetary policy is a broad macroeconomic instrument that cannot target specific segments of the economy. As a result, monetary policy can play only a supporting role in promoting better and more inclusive employment outcomes.

Providing increased clarity on the conduct of monetary policy helps build on the Bank's past success in achieving low and stable inflation and contributing to overall macroeconomic stability. Leveraging the flexibility of the framework addresses important structural changes in Canada's economy and is intended to maximize the shared benefits that monetary policy can deliver for Canadians. The clarity and continuity of the renewed monetary policy framework will continue to support the Bank's primary objective of maintaining low, stable inflation over time.

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