BANK OF CANADA
BANQUE DU CANADA

Staff Discussion Paper/Document d'analyse du personnel — 2020-7

Last updated: August 6, 2020

Strengthening Inflation Targeting: Review and Renewal Processes in Canada and Other Advanced Jurisdictions

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ISSN 1701-9397

Acknowledgements

We thank Jacob Dolinar for excellent research assistance and the Bank of Canada's Knowledge and Information Services team for their help finding sources. We also thank David Archer and John Murray for some very useful feedback on earlier versions of this discussion paper. Any remaining errors are our own.

Abstract

A growing number of advanced economies with monetary policy frameworks that involve inflation targeting have adopted formal processes of review and renewal. These allow policymakers and other stakeholders to assess the current framework's performance to date, explore the merits of potential alternative frameworks and reach decisions about how best to enhance design and implementation. In this paper, we argue that well-governed review and renewal processes can contribute importantly to the success of a monetary policy framework: (1) they help to adjust the framework in response to experience, theoretical developments and changes in the economy; and (2) they enhance the legitimacy and credibility of changes made to the framework. However, as these processes involve inputs from the government or legislature, they also create potential for tensions regarding central bank independence. We use an international comparison to show that these considerations have been balanced in different ways across countries and time, with a spectrum running from relatively technocratic processes to ones more closely linked to the political cycle. We also highlight several unique aspects of the modern review and renewal experience in Canada, where renewals of the Bank of Canada's joint inflation-control agreement with the government have regularly been preceded by in-depth framework reviews, each involving a large amount of original research and significant levels of transparency.

Topics: Monetary policy framework; Central bank research; Inflation targets
JEL codes: E52, E58

Résumé

Un nombre croissant d'économies avancées dont le cadre de politique monétaire est axé sur le ciblage de l'inflation ont adopté des processus formels d'examen et de renouvellement de leur cadre. Les décideurs et autres parties prenantes peuvent ainsi évaluer les résultats obtenus depuis son entrée en vigueur, analyser les vertus d'autres cadres potentiels et déterminer les améliorations pertinentes à apporter à la conception et à la mise en œuvre du cadre. Dans notre étude, nous soutenons que des processus d'examen et de renouvellement bien menés peuvent contribuer à la réussite d'un cadre de politique monétaire, et ce, de deux façons : d'abord, en facilitant l'ajustement du cadre en fonction de l'expérience accumulée, des évolutions théoriques et des changements touchant l'économie; ensuite, en renforçant la légitimité et la crédibilité des modifications apportées au cadre. Toutefois, puisqu'ils impliquent la participation des gouvernements ou des instances législatives, ces processus peuvent créer des tensions quant à l'indépendance des banques centrales. En nous appuyant sur une comparaison internationale, nous montrons que l'équilibre entre ces considérations varie d'un pays à l'autre et dans le temps. Cette comparaison révèle en effet un éventail de processus allant de ceux relativement technocratiques à d'autres plus étroitement liés au cycle politique. Nous mettons aussi en relief plusieurs aspects particuliers de l'expérience canadienne moderne, comme le fait que les renouvellements de l'entente conjointe de maîtrise de l'inflation entre la Banque du Canada et le gouvernement fédéral ont tous été précédés d'examens approfondis du cadre. Ceux-ci ont donné lieu à de nombreux travaux de recherche originaux et à un degré important de transparence.

Sujets : Cadre de la politique monétaire; Recherches menées par les banques centrales; Cibles en matière d'inflation
Codes JEL : E52, E58

1. Introduction

Since New Zealand and Canada became the first two countries to adopt an inflation target as a central pillar of their monetary policy frameworks in 1990 and 1991, many other advanced and emerging economies have followed suit.[1] In many jurisdictions with inflation-targeting regimes (IT regimes), one factor that has contributed to their ongoing success in achieving low and stable inflation is their adoption of processes to review, renew and improve their monetary policy frameworks by incorporating lessons from experience and economic research.

In this regard, Canada's experience is unique. From the outset, the IT regime was based on a short agreement between the Government of Canada and the Bank of Canada that specified the inflation target. The joint agreement was an important innovation, but even more so was the process by which the government and the central bank review and renew the target on a regular basis, as this process broke new ground for the political economy of central banking.

The Canadian review and renewal process has drawn much attention for its distinctive features.[2] In particular, it is deliberate, in-depth, research-driven and transparent, with extensive documentation and background research publicly available. In addition, the process strives to consult and engage all relevant stakeholders (the government, academics, private sector economists, market participants and the public) and to draw from experience in Canada and elsewhere and from internal and external research. This systematic and well-governed process has helped focus the Bank of Canada's research while deepening understanding and improving operational implementation of the IT regime.

The purposes of this paper are (i) to explain and assess the process of reviewing and renewing the IT regime in Canada, (ii) to compare it with processes in other jurisdictions to draw useful lessons and (iii) to better understand how these processes contribute to the success of inflation targeting in Canada and elsewhere. We pay specific attention to the governance of these review and renewal processes to provide a political economy perspective, because political

[1] According to a recent tally compiled by the International Monetary Fund, 36 countries operate under monetary policy frameworks that combine an inflation target with a flexible exchange rate (International Monetary Fund 2019). In this paper, we narrowly define the monetary policy framework to include objectives or targets and strategies to achieve them. Other issues related primarily to the implementation of the framework (such as governance, transparency, tools and policy coordination) are not considered in depth. Fuhrer et al. (2018) provide a more comprehensive definition of the monetary policy framework.

[2] See, for example, Fuhrer et al. (2018). In addition, John Williams, President of the New York Federal Reserve Bank, was recently quoted as follows: "Particular kudos to the Bank of Canada . . . [T]hey have a very serious deep dive and thoughtful consideration of these issues. I think of them as conducting best practice in terms of willingness to consider these issues and to think long term and to do it in a very open-minded way. So I think other central banks should follow the Bank of Canada's lead here." See Applebaum (2016) for more details.

endorsement of both the IT regime and the renewal process enhances the political legitimacy and credibility of the Canadian monetary policy framework.

For many jurisdictions whose monetary policy frameworks incorporate an inflation target, including Canada, the policy goal is either set by the government or jointly set by the government and central bank. In these cases, the central bank is concomitantly given operational independence to achieve the policy goal. In other situations, such as for the US Federal Reserve, the central bank is given a mandate that includes price stability in its governing legislation, and the central bank determines the policy goal consistent with this mandate. In either case, the ongoing need for review and renewal is driven by several factors related to uncertainty about the optimality of the policy goal and to improving operational aspects of the regime, especially as experience and understanding accumulate and economic circumstances change.

For example, when Canada first adopted the inflation target, the inflation rate was in the 6 percent range, well above any reasonable definition of price stability. At the same time, there was uncertainty about what inflation rate was consistent with price stability and how effective the IT regime would be in achieving it. Economic theory was too undeveloped at the time to compellingly predict what would be the outcomes of the new regime. Equally, practical experience was essentially non-existent. Given these critical uncertainties, the Government of Canada and the Bank of Canada agreed to a "glide path" under which inflation would gradually fall into a 1 to 3 percent band, at which point the two parties would review the regime's performance and renew the framework at a target rate that reflected their growing understanding of the appropriate practical definition of price stability.

In the event, inflation declined faster than expected, due in part to the regime itself but also to other coincident forces. The inflation target underwent its first three renewals in 1993, 1998 and 2001, each leading to an extension of the 1 to 3 percent band and 2 percent midpoint. Thereafter, a regular five-year renewal process was established, with renewals in 2006, 2011 and 2016, and the next one in 2021. While the basic elements of the renewal process, including its governance, have largely been retained, the process has evolved over time.

Other jurisdictions have similarly implemented review and renewal processes to incorporate experience and knowledge gained and to cope with shifting economic circumstances. In addition, as in Canada, these processes in other jurisdictions have evolved over time, often driven by political economy considerations. In a recent paper, Wadsworth (2017) provides an overview of these processes across 10 major central banks, focusing primarily on whether reviews are time- or state-dependent (e.g., whether they are conducted on a regular time interval or when the government or central bank governor changes) and whether reviews are published or not. This classification speaks, somewhat indirectly, to the governance of the process, which is critical to its effectiveness.

In the next section of the paper, we examine the review and renewal process in Canada, focusing on the important lessons learned and implications for the design of the monetary policy framework. The following section considers the approaches taken in other countries—namely, New Zealand, the United Kingdom, Sweden and the United States—to review and update their IT regimes. The penultimate section synthesizes these disparate approaches and draws inferences about best practices. In general, while the five countries considered have taken different approaches to review and renew their IT regimes, the macroeconomic outcomes, including inflation performance, have been comparable. This finding likely reflects that these countries' inflation targets have all been relatively low, approximately 2 percent, and have been implemented in similar flexible and forward-looking manners. Moreover, the comparable economic outcomes also likely indicate the overall robustness and resilience of a monetary policy framework incorporating an inflation target. Nonetheless, some differences in these countries' review and renewal processes are noteworthy, especially regarding the governance and conduct of these processes, including (i) their timing and degree of state versus time dependence; (ii) their transparency and degree of reliance on external consultation; and (iii) the roles played by the central bank and government. The final section offers concluding remarks.

2. Review and renewal in Canada: a brief history

The 1991 inflation-targeting agreement and its historical context

The origins of the inflation-targeting framework in Canada can be traced back to the poor economic performance that Canada and many other advanced economies experienced in the 1970s and early 1980s, a period generally characterized by high inflation, lacklustre growth and a series of large oil price shocks. Having exited the Bretton Woods system in 1970, policy-makers at the Bank of Canada (BoC) began experimenting in 1975 with a system of M1 money-growth targets. However, these targets proved incapable of delivering sustainably lower inflation, leading to their abandonment in 1982 (see Thiessen 1983 for more information). The latter half of the 1980s thus saw the BoC set its policies on a relatively ad hoc basis while researching new anchors around which to frame monetary policy in the longer run. These anchors included alternative money supply measures, aggregate nominal spending and the price level itself (see Longworth and Poloz 1986; Caramazza, Hostland and Poloz 1990; and Duguay and Longworth 1998). The 1987 appointment of Governor John Crow also marked a distinct shift in the BoC's public rhetoric, which started placing much greater emphasis on the importance of price stability as the main goal of monetary policy. For example, Crow's 1988 Hanson Lecture at the University of Alberta identified price stability as "the most durable contribution [that] monetary policy can make to our standard of living" (Crow 1988). However, the lecture offered neither a quantitative definition of "price stability" nor a precise view of the operational framework within which to pursue it.

In February 1991, a clear framework finally emerged in the form of a short agreement between the BoC and the Conservative government then in power, the latter represented by the Department of Finance. Under this agreement, which the Minister of Finance announced as part of that year's federal budget speech, Canada became the second country in the world to adopt a formal inflation target. More specifically, the agreement laid out a "glide path" for inflation. Along this path, year-over-year consumer price index (CPI) inflation, then totalling more than 6 percent, would gradually fall to 3 percent by the end of 1992, then 2.5 percent by mid-1994, and finally 2 percent by the end of 1995. Around each of these milestones was a tolerance of plus or minus 1 percentage point. Though the agreement specified no targets for the post-1995 period, an accompanying press release noted,

> the objective would be further reductions in inflation until price stability is achieved. A good deal of work has already been done in Canada on what stability in the broad level of prices means operationally. This work suggests a rate of increase in consumer prices that is clearly below two per cent. However, a precise definition is not being specified now, in the event that further evidence and analysis relevant to this matter become available in the next few years. (Bank of Canada 1991, 5)

As the international comparison below makes clear, a distinguishing feature of the Canadian experience with inflation targeting is that the 1991 agreement was not accompanied or followed by major changes in legislation. In fact, a parliamentary committee convened around the time of the agreement explored the case for amending the *Bank of Canada Act* to include a narrow price-stability mandate, but the notion was ultimately rejected on the grounds that "[m]onetary policy has powerful [real] effects in the short-run . . . [and] ought not to be absolved of responsibility for [them]" (Canada 1992, 22). The committee also noted that fiscal policy-makers have an important role to play in ensuring price stability and might interpret a narrow mandate "as a licence to shun any responsibility for inflation control" (22). Because the issue has not been revisited since, the BoC's formal mandate as it reads in the act remains quite broad:

> to regulate credit and currency in the best interests of the economic life of the nation, to control and protect the external value of the national monetary unit and to mitigate by its influence fluctuations in the general level of production, trade, prices

> and employment, so far as may be possible within the scope of monetary action, and generally to promote the economic and financial welfare of Canada. (Canada 1985, 1)

The view that an inflation target represents the best way to fulfill this relatively broad mandate is thus based simply on a non-legislative agreement between the BoC and the government. We now use the remainder of this section to elaborate on the six occasions that this agreement has since come up for renewal.

The first two renewals: 1993 and 1998

The first renewal occurred because of an unusual confluence of events in late 1993, when an election shifted power to a Liberal majority only months before Crow's term as Governor was due to expire. Over the weeks following the election, Crow and the incoming Minister of Finance clashed over the terms under which the inflation-targeting agreement would be renewed. The minister viewed this issue as requiring settlement before the government could make a decision about Crow's potential re-appointment (see Martin 2008, 111–117). While the minister preferred that the BoC continue targeting inflation at 2 percent after reaching the last milestone on the "glide path" first laid out in 1991, Crow maintained the view that the optimal inflation target lay in a lower range (see Crow 2002, 206–210).

This impasse led to the appointment of Governor Gordon Theissen as Crow's successor. Once finalized, the appointment was announced alongside news that the BoC and the government had reached an agreement "to maintain the objective of holding inflation inside the range of 1 to 3 per cent (mid-point 2 per cent)" (Bank of Canada 1993, 1). As for the longer-run shape of the monetary policy framework, the 1993 agreement noted,

> It is a long time since Canada has had inflation as low as it is now, and more experience in operating under these conditions would be helpful before an appropriate longer-term objective is determined. Moreover, some time is needed to enable Canadians to adjust to the improved inflation outlook . . . On the basis of the experience with low inflation over the period [ahead], a decision will be made by 1998 on the target range . . . that would be consistent with price stability and, therefore, with the long-run monetary policy goal of preserving confidence in the value of money. (Bank of Canada 1993, 1)

Neither the BoC nor the government viewed the experience accumulated over the following five years as sufficiently informative to settle this issue. In fact, the new monetary policy framework had yet to experience a full business cycle by the time the two parties began discussing the terms of the 1998 renewal.[3] The 1998 agreement therefore stipulated that the objectives laid out in the previous round would remain in effect until 2001, by which time a decision would be made about the appropriate "long-run target for monetary policy" (Bank of Canada 1998).

This extension should not be interpreted as a sign that policy-makers were dissatisfied with the inflation-targeting framework's performance in the years leading up to the 1998 renewal. On the contrary, the framework had performed much better than initially expected, especially beginning around 1995, when the credibility of monetary policy started benefiting from an aggressive fiscal retrenchment that helped to alleviate long-standing concerns about the sustainability of the government's finances.[4] Since passing the first milestone on the target path laid out in the original 1991 agreement, CPI inflation had averaged 1.5 percent up to the time of the 1998 renewal and had spent roughly 70 percent of the time inside the BoC's target band.[5] This relative stability was achieved despite sizable shocks, including financial crises in Mexico and Asia, a referendum on independence in Quebec and large swings in the value of the Canadian dollar. Policy-makers' increasing experience with inflation targeting and growing appreciation for its largely unforeseen benefit of making monetary policy decisions easier to explain also led to a series of improvements in key operational aspects of the monetary policy framework. Most of these aimed at improving transparency and better exploiting communication as a tool of monetary policy. As detailed in Carter, Mendes and Schembri (2018), these improvements included the release of the BoC's first *Monetary Policy Report*, a significant streamlining of the policy-setting process and the introduction of an explicit operating band for the overnight rate.

Though not specifically identified in the 1998 agreement, another factor behind the postponement of any decision on the "long-run" form of the monetary policy framework had to do with the state of the academic literature at the time in question. Downward nominal wage rigidity (DNWR) and the effective lower bound (ELB) had both recently been identified as factors that might favour somewhat higher inflation targets (see, e.g., Summers 1991; Akerlof, Dickens and Perry 1996; Fischer 1996; and Krugman 1996, 1998). However, the research projects the BoC had initiated in these areas were still at too early a stage to inform framework decisions. Many of these projects had matured into working papers and journal articles by the time of the 2001 agreement, to which we now turn our attention.

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[3] As stressed in Thiessen (1998).

[4] See, for example, Longworth (2002); also see Freedman (2001, section 3) for an insider's view on the constraints that concerns about fiscal sustainability placed on monetary policy in the early 1990s.

[5] In these respects, the Canadian experience compares favourably against the average experience of countries that used inflation targets to engineer transitions from high to low inflation in the 1990s. See section IV.C of Roger and Stone (2005) for details, along with Roger (2010).

The modern renewals: 2001, 2006, 2011 and 2016

The 2001 renewal stands out as the first that was formally organized around a small number of publicly announced research questions. As a result, the 2001 agreement, which extended the 1 to 3 percent target band through to 2006, was also the first to be accompanied by a series of background documents. In these, the BoC summarized the relevant research that staff had conducted and published, in addition to highlighting the related parts of the wider literature and explaining how these inputs had helped to inform policy-makers' overall reasoning (Bank of Canada 2001a, 2001b, 2001c). The BoC specifically used these background documents to explain that staff research suggested the costs of DNWR and the ELB were too small to warrant a higher inflation target. At the same time, the literature on the potential benefits of a *lower* target had yet "to make a convincing case that . . . [such] benefits . . . are large enough to justify . . . [such] a change" (Bank of Canada 2001c).

Apart from its greater stress on research, several other aspects of the 2001 agreement distinguish it from previous renewals in significant ways. For example, relative to the 1993 and 1998 renewals, it provided significantly more explicit language clarifying the importance of the midpoint of the target band, emphasizing that the band should be interpreted "as a reflection of . . . short-run uncertainty" rather than "a measure of . . . indifference" (BoC 2001a, 4) and that monetary policy would therefore "continue to aim at keeping the trend of inflation at the 2 per cent target midpoint" (Canada, Department of Finance 2001, 1). Another key point of departure was that the 2001 renewal was the first to avoid suggesting the BoC and the government would eventually make some definitive decision about the "long-run" form of the monetary policy framework. It instead allowed for the possibility that framework questions could be revisited periodically as the economy and literature continued to evolve. Relative to previous rounds, the 2001 agreement also provided substantially more detail on operational aspects of the monetary policy framework, especially concerning the role that measures of core inflation played in the BoC's decision making. In these and other respects, the 2001 agreement emerges as a clear inflection point between the framework reviews of the 1990s and the more systematic and transparent approach that has come to characterize the modern review and renewal process in Canada.

Renewals have since occurred every five years. Like the 2001 renewal, each has been preceded by a research program focusing on a small set of clearly specified key questions and priorities. Given the lags involved in producing research, the lead-up to a given renewal has become a multi-year process. It begins with an early stage at which the BoC publicly identifies framework questions that warrant attention in light of recent economic developments or advances in the academic literature.[6] BoC staff then study these questions in detail, often in collaboration with colleagues in academia and other policy institutions, and review the current framework's performance to date and the relevant parts of the wider literature. As the renewal approaches, the resulting body of research informs the BoC and government's discussion of its terms. Key takeaways are then summarized in background documents released alongside the agreement the two parties reach.

All three renewals since 2001 have left both the level of the inflation target and the width of the target band unchanged. Nonetheless, the research undertaken in preparation for the post-2001 renewals has led to significant refinements in other aspects of the monetary policy framework, especially regarding the flexible time horizon at which policy-makers aim to bring inflation back to target and the extent to which the Bank incorporates financial stability considerations into monetary-policy decisions.[7] The post-2001 renewals have also seriously considered the merits of higher and lower inflation targets, along with those of a switch to price-level targeting (PLT), though the current framework's strong record implies that the bar for such fundamental changes is relatively high. While a full review of the 2006, 2011 and 2016 renewals and supporting research programs lies outside the scope of this paper, we use the remainder of this section to briefly discuss some of their main themes.[8]

Target-horizon flexibility

The appropriate horizon at which policy-makers should aim to return inflation to target was a major topic of the research program leading up to the 2006 renewal.[9] Generally speaking, this research supported a view expressed in previous rounds that the lags associated with monetary transmission normally favour target horizons in the six- to eight-quarter range. However,

> studies . . . using detailed macroeconomic models to simulate the effects of a wide variety of disturbances have shown that some shocks have more long-lived effects . . . and might, therefore, require a longer time horizon . . . [This would] involve

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[6] Note that the set of framework questions under consideration could be revised or expanded in response to new developments that occur as a given renewal date approaches. For example, price-level targeting and the potential benefits of a lower inflation target had initially been identified as the main themes of the research program leading up to the 2011 renewal, but the relationship between monetary policy and financial stability was later added as a third theme in view of the events of the global financial crisis.

[7] Though outside the main scope of this paper, the research programs associated with the 2001, 2006 and 2016 renewals also explored various measures of core inflation and their usefulness as inputs in the policy-making process. The 2016 program, in particular, led to an overhaul of the Bank's approach to measuring core inflation, the details of which were announced in background documents accompanying the 2016 renewal. For details, see Bank of Canada (2016, 19–21).

[8] See Carter, Mendes and Schembri (2018) for more information.

[9] For more details, consult Bank of Canada (2006, subsections 2.2 and 2.3).

> sacrificing something in terms of inflation performance over the usual horizon but could lead to greater financial, economic, and inflation stability over a somewhat longer horizon. (Bank of Canada 2006, 8–9)

To this day, judicious adjustments in the target horizon remain the main mechanism through which the BoC confronts short-run trade-offs between monetary policy's effects on prices and the real economy. As we explain in our next subsection, a flexible target horizon also represents a key component in the BoC's management of potential trade-offs between price stability and financial stability. For these reasons, the inflation-targeting framework can more accurately be viewed as a form of "flexible inflation forecast targeting" as in Svensson (1997).

Though the target horizon was not included among the main topics of the research programs associated with the 2011 and 2016 renewals, the years following the 2006 renewal witnessed multiple occasions on which the BoC indeed found it useful to extend its target horizon beyond the usual six- to eight-quarter window. For example, extensions of the horizon helped to enable the extraordinarily stimulative policies the BoC pursued in response to the global financial crisis (GFC), most notably including the conditional forward guidance policies the BoC experimented with over the 2009–10 period. The BoC's contributions to the 2011 and 2016 renewals therefore included language reaffirming the importance of the flexible target horizon while stressing that this flexibility represents a key dividend of the framework's strong performance to date (see Bank of Canada 2011, section 4; and Bank of Canada 2016, 31–32). In particular, "the Bank's scope to exercise appropriate flexibility is founded on the credibility built up through its demonstrated success in achieving the inflation target and its regular, clear and transparent communications" (Bank of Canada 2016, 23).

The monetary-financial nexus

Some of the best examples of how the modern renewal process has facilitated the evolution of the monetary policy framework concern the difficult question of how far central banks should incorporate financial stability considerations into the conduct of monetary policy: the monetary-financial "nexus." At the time of the 2006 renewal, the literature viewed this issue largely through the lens of the rise and subsequent collapse that dotcom stock prices experienced over the late 1990s and early 2000s (e.g., Bernanke and Gertler 1999; and Cecchetti et al. 2000). As a result, the relevant parts of the 2006 renewal focused exclusively on asset prices (see Bank of Canada 2006, subsections 2.2 and 2.3). More specifically, the 2006 renewal documents affirmed a widely held view at the time that central banks should normally respond to asset price movements only to the extent that they convey information about output and inflation over policy-makers' usual target horizons. The 2011 renewal then shifted attention to excessive leverage as a threat to financial stability, arguing that the GFC had clearly "underlined the importance of . . . indebtedness rather than asset prices as a defining feature of dangerous financial imbalances" (Bank of Canada 2011, 21). The depth of the ensuing recession had also provided a vivid demonstration of the potential consequences of a disorderly unwinding of excessive leverage.

Despite the differences in the particular financial imbalances the 2006 and 2011 renewals focused on, both recognized that these imbalances could occasionally require monetary policy to consider financial stability, in which case the flexibility of the Bank's target horizon would allow policy-makers to respond as needed. In particular, the 2011 renewal background document recognized that micro- and macroprudential policies had a larger role to play in containing financial vulnerabilities but argued that monetary policy's "broad influence on financial markets and . . . institutions" could occasionally make it "a potentially valuable tool in addressing imbalances that may . . . have economy-wide implications" (Bank of Canada 2011, 26).

That said, developments in the economy and literature leading up to the 2016 renewal resulted in the BoC concluding that "episodes of tension between the inflation-targeting objective . . . and risks to financial stability . . . [should] be less common than previously assessed" (Bank of Canada 2016, 4). This reassessment stemmed largely from a series of financial sector reforms that the G20 and the Financial Stability Board had championed in the wake of the GFC. Many of these reforms were showing clear signs of having made the global financial system more resilient by the time of the 2016 renewal. In addition to setting an example as an early adopter of many of these reforms, the Canadian government had also ushered in a series of tighter mortgage finance regulations aimed at limiting excess household debt and better containing potential imbalances in regional housing markets. At the same time, research at the BoC and elsewhere had led many policy-makers to conclude that tighter monetary policy was simply too blunt an instrument to deliver any significant improvement in financial stability at an acceptable cost in terms of output and inflation. For these reasons, the BoC's contributions to the 2016 renewal stressed that "monetary policy should be adjusted only in exceptional circumstances to address financial vulnerabilities," along with the more general need for "a clear assignment of policies and responsibilities . . . in achieving both monetary policy objectives and financial stability objectives" (Bank of Canada 2016, 28).[10]

[10] Bank of Canada (2016) also stresses that "central banks . . . can contribute importantly to the promotion of financial stability through [channels other than direct adjustments in monetary policy, including] . . . their system-wide assessment of [financial] vulnerabilities and . . . public communications. This transparency will raise awareness and thereby promote responsible behaviour by borrowers and lenders and help encourage the appropriate regulatory and supervisory responses" (36). Schembri (2016) provides more information on these alternative channels.

The optimal level of the inflation target

While the optimal level of the inflation target was not a theme of the research program associated with the 2006 renewal, the merits of a lower target were one of three main topics that BoC staff researched in preparation for the 2011 renewal (see Bank of Canada 2011, section 2). This research focused mainly on inflation's effects on the reliability of price signals and agents' incentives to hold money. Findings generally suggested that "the prospective benefits of a lower inflation target are . . . greater than previously estimated" (Bank of Canada 2011, 13). However, most of the projects in question relied on models that abstracted from the ELB, as did much of the wider literature at the time. Given this omission, coupled with the fact that the GFC had led to dramatic revisions in policy-makers' assessments of the likely frequency and cost of ELB episodes, the BoC judged that "the benefits [of a lower target] can [only] be pursued with confidence . . . [if central banks] find a way to limit the probability of hitting the . . . ELB] and to deal with it more effectively when they do" (Bank of Canada 2011, 13). Among other things, this would require an accurate sense of how successfully the above-noted financial sector reforms had insulated the economy from large financial shocks, as well as a deeper understanding of the effectiveness and reliability of the unconventional instruments that central banks had added to their tool kits in the aftermath of the GFC.

The BoC and the government revisited the optimal level of the inflation target as part of the 2016 renewal, but by that time their focus had shifted to the merits of a *higher* target (see Bank of Canada 2016, 9–18). This change was partly because the ELB had proven to be a significantly greater constraint on monetary policy in many jurisdictions, relative to expectations during the 2011 renewal. At the same time, estimated real neutral policy rates had come under significant downward pressure in many advanced economies and naturally implied a higher frequency of ELB episodes, all else being equal. While these developments clearly strengthened the case for raising the inflation target,[11] the years between the 2011 and 2016 renewals had also produced many more examples of unconventional monetary policies in action. The growing literature in that area suggested that these policies could be reasonably effective in easing monetary conditions during periods that the ELB binds. Indeed, while simulations abstracting from unconventional tools indicated that a higher target could lead to modest improvements in macroeconomic performance, the BoC found that simulations incorporating these tools reduced the marginal benefits of a higher target to insignificant levels. For these reasons, the BoC judged that the benefits of a higher inflation target were likely outweighed by the associated costs, including the distorted relative price signals and money-holding frictions noted earlier. Other

[11] As stressed by Blanchard, Dell'Ariccia and Mauro (2010), Ball (2014), Krugman (2014a, 2014b) and others.

relevant costs included the regressive redistributive effects of higher inflation and potential threats to the credibility of a revised target.

Price-level targeting

Though not considered as part of the 2006 and 2016 renewals, PLT was a major theme of the research program associated with the 2011 renewal (see Bank of Canada 2011, section 3). At the time, policy-makers' interest in PLT stemmed largely from the sizable literature that had grown around the "free lunch" hypothesis of Svensson (1999). This is the notion that PLT might deliver superior short-run stabilization since it tends, for example, to pair lower inflation outcomes with offsetting expectations of higher future inflation. Indeed, several BoC research projects suggested that a shift to PLT would likely lead to a modest improvement in business-cycle performance. This finding held even after accounting for global commodity price shocks and other factors that would make PLT more difficult to implement in small open economies, relative to the closed-economy models employed in much of the theoretical literature. At the same time, a separate branch of the BoC research program explored a potential longer-run benefit of PLT—namely, that the elimination of base drift in the price level would reduce an important source of risk associated with medium- and long-term nominal contracts.

Of course, the benefits in question all require that firms and households "are forward-looking, are . . . conversant with the implications of PLT and trust policy-makers to live up to their commitments" (Bank of Canada 2011, 19). While most of the above-noted projects relied on models that assumed rational expectations and full credibility on the part of monetary policy, several additional projects explored the robustness of PLT in settings where these assumptions failed. Generally speaking, this research pointed to a sizable danger that PLT's net benefits relative to inflation targeting could be significantly reduced—if not fully reversed—under such circumstances. This was especially problematic in view of the communication challenges PLT would entail: it would involve acclimatizing the public from a situation where the central bank targets a constant inflation rate to one where policy-makers aim to adjust inflation as needed to offset shocks to the price level. Significant challenges to credibility would also likely arise following large upside surprises to the price level, since the output costs associated with unwinding such surprises could potentially be quite large. For these reasons, the BoC judged that "it is not presently clear that . . . [the necessary conditions] would be sufficiently satisfied in the real world . . . to have confidence that PLT could improve on the current inflation target-targeting framework" (Bank of Canada 2011, 14).

Summary

In summary, the systematic and research-oriented review and renewal process of the BoC's monetary policy framework has been comprehensive, examining a wide range of pertinent monetary policy questions. It was also effective in enhancing the policy framework, primarily its implementation in light of experience and academic research. The rigorous governance of the process—in particular, its transparency and accountability to both the public and the government—underpinned the success of the IT framework.

3. Review and renewal processes in other advanced jurisdictions

Other jurisdictions with monetary policy frameworks similar to Canada's have also taken steps to review and renew their frameworks. Approaches differ considerably across countries in terms of their governance and implementation, and instructive lessons can be drawn from these differences. In this section, we explore the experiences of three other early adopters of inflation targeting—namely, the Reserve Bank of New Zealand, the Bank of England and the Swedish Riksbank—then shift to the US Federal Reserve.

Before proceeding, it will be useful to note a key organizing principle: we can distinguish between a given country's "renewal" process, meaning the formal process by which policy-makers reach decisions about the form of the monetary policy framework, and the same country's "review" process, meaning the process of assessing the current framework's performance to date and exploring the merits of potential alternative frameworks. In Canada, the renewal process corresponds to the periodic negotiations between the BoC and the federal government concerning the monetary policy framework, while the review process corresponds to the research programs the BoC has undertaken since 2001 in advance of each of these negotiations. As we show below, the analogous processes in other countries can differ considerably in terms of their timing, governance and other key dimensions. For example, processes that are led by the central bank in one jurisdiction may be led by the government or legislature in another. Similarly, processes that occur with a fixed frequency in one jurisdiction might elsewhere be tied to elections or changes in central bank leadership, implying potentially important differences in the degree of time-dependence versus state-dependence.

With these points in mind, we now turn our attention to the individual countries. In the case of the early adopters, we begin with a review of the history of their respective monetary policy frameworks before elaborating on their review and renewal processes and some of their recent experiences with those processes. In the case of the United States, we adopt a different structure more reflective of the country's relatively limited experience with an explicit numeric inflation target.

The Reserve Bank of New Zealand

Historical context

Much like Canada, New Zealand traces the origins of its inflation-targeting framework back to a period of poor economic performance in the 1970s and early 1980s, an era during which the country struggled with high inflation, weak growth and persistent balance-of-payments problems. Many factors contributed to this experience, including large commodity, chiefly agricultural, price shocks. Another contributing factor was poor economic management over the years 1975–84, when various governments responded to the economic situation by experimenting with controls on prices, wages, and interest and exchange rates (see Singleton et al. 2006, chapter 2).

Though policy-makers at the Reserve Bank of New Zealand (RBNZ) argued against these controls, the RBNZ was at the time operating under legislation that allocated final say on day-to-day monetary policy decisions to the Minister of Finance. The RBNZ's main responsibilities were thus simply to advise the minister and then implement the minister's choices. Moreover, the institution's legal mandate was relatively vague at the time, with the *Reserve Bank of New Zealand Act* of 1964 stipulating that the government should ensure that monetary policy is "directed to the maintenance and promotion of economic and social welfare in New Zealand having regard to the desirability of promoting the highest degree of production, trade, and employment and of maintaining a stable internal price level" (New Zealand 1964, 1017). Since this act was silent as to how these desirables should be weighted in situations where they conflicted, virtually any decision the Minister of Finance reached regarding monetary policy could be rationalized with relative ease.

Given this background, the Labour government elected in 1984 made it a top priority to explore legislation that might better insulate monetary policy from political influence while clarifying the mandate under which a more independent RBNZ might ultimately operate. Over the years following the 1984 election, Minister of Finance Roger Douglas solicited advice from the RBNZ and Treasury on these related issues, both of which took on added urgency as the new government began liberalizing prices, thus releasing long pent-up inflationary pressures. Discussions between the RBNZ and the Treasury were sometimes fractious (see Goodhart 2010). However, both sides agreed from the outset that some broad notion of "price stability" should be foremost in a new RBNZ mandate. Over time, they also reached a common view that the RBNZ and the government should both have a hand in specifying a more precise quantitative definition, which the RBNZ should then be allowed to pursue with a high degree of operational independence.

This arrangement was formalized in the *Reserve Bank of New Zealand Act* of 1989. Under this act, the RBNZ governor became the sole decision-maker responsible for setting monetary policy, and the wide-ranging mandate above was replaced with a clear statement that the RBNZ's "primary function" should be "to formulate and implement monetary policy directed to the economic objective of achieving and maintaining stability in the general level of prices" (New Zealand 1989, 16). This narrow mandate remained in place until 2019, when the RBNZ's governing legislation underwent significant amendments, on which we elaborate below.[12]

An important feature of the 1989 act was that it offered no precise definition of price stability, nor a view on how the RBNZ should go about achieving it. Instead, the act put in place a system under which the RBNZ governor and the Minister of Finance would periodically negotiate on an appropriate operational target that would then be made public in the form of a "Policy Targets Agreement" (PTA). This system was designed to ensure a significant degree of flexibility in the RBNZ's policy framework, allowing for the possibility that the most appropriate operational target might change as the economy and theoretical understanding evolved and as policy-makers accumulated more experience. As a result, the two parties to a given PTA could in principle settle on a view that price stability would be best served by directly targeting inflation or the price level or by pursuing any number of intermediate targets involving the money supply, exchange rate, aggregate nominal spending or other such variables. The first PTA, negotiated by Minister of Finance David Caygill and RBNZ Governor Donald Brash in March 1990, focused on an inflation target in the 0 to 2 percent range, and all subsequent agreements retained this focus on inflation targets.

Under the PTA system, the governor and minister were required to negotiate a new PTA before the former party's appointment or re-appointment. In the absence of renegotiation or an early change in governor, PTAs would then generally inherit the governor's own five-year fixed term. However, the 1989 *Reserve Bank of New Zealand Act* allowed for the possibility that the minister and governor might by mutual agreement opt to amend or replace a PTA already in place. Historically speaking, newly elected governments tended to use this flexibility to introduce new PTAs soon after taking power. For example, the National government that replaced Labour in fall 1990 negotiated a new PTA in December of that year. At that time, however, the targeting

[12] Though it was never exercised, section 12 of the *Reserve Bank of New Zealand Act* of 1989 granted the government a reserve power whereby the above-noted "primary function" could be temporarily overridden.

framework had a strong supporter in incoming Minister of Finance Ruth Richardson, who agreed to leave the 0 to 2 percent target range in place. Similarly, a fall 1996 election that forced the National party into a coalition with the New Zealand First (NZF) party was soon followed by a PTA in which the upper bound of the target range was increased from 2 to 3 percent. This measure was largely aimed at accommodating NZF's demands that the currency be allowed to depreciate to benefit farmers and exporters, who comprised a large part of the party's base of support.

A key pattern common to many of the PTAs negotiated in the 1990s and early 2000s was that successive PTAs tended to encode increasing degrees of flexibility into the inflation-targeting framework. For example, the PTA negotiated following Labour's return to power in fall 1999 required the RBNZ to "avoid unnecessary instability in output, interest rates and exchange rates" (Reserve Bank of New Zealand 1999), while the next PTA in 2002 stipulated that the RBNZ's main objective should be to keep inflation in the target range "on average over the medium run" (Reserve Bank of New Zealand 2002). All subsequent PTAs retained similar instructions, in contrast to previous agreements under which the monetary policy objective applied year-by-year, with less explicit consideration of the possible short-run trade-offs between price and real stability. These shifts toward a more flexible, medium-run approach were due to many factors, not least including policy-makers' evolving understanding of the monetary transmission process and associated lags. Moreover, Drew (2002) and Sherwin (1999) emphasize the new framework's growing credibility and resulting greater "maneuvering room," especially following a series of fiscal reforms that were implemented in the mid-1990s. These reforms helped to reinforce the government's commitment to price stability.[13]

For all these reasons, the essential feature of the evolution of the monetary policy framework over its first decade was that the RBNZ gradually shifted from a form of relatively strict inflation targeting to an increasingly flexible form of inflation forecast targeting as practised by many of the RBNZ's peer institutions. This commonality was further reinforced by the fact that the 2002 PTA raised the lower bound of the target range from 0 to 1 percent, thus bringing the range's width and midpoint more in line with those of other early adopter countries.[14] Although the resulting 1 to 3 percent range remains in place to this day, recent years have, as mentioned earlier, witnessed several material changes to the RBNZ's monetary policy framework. As we explain in our next subsection, these changes included (i) an amendment to the *Reserve Bank of New Zealand Act* that expanded the RBNZ's legal mandate to include an employment objective

[13] For more details, see Buckle (2018a).

[14] Another key way in which the framework evolved over its early years had to do with the precise price index used to compute the targeted measure of inflation, which varied across successive PTAs. See Buckle (2018b, section 5.5) for further details.

and (ii) a phase-out of the PTA system in favour of a "remit" system under which the Minister of Finance is now responsible for providing the RBNZ with instructions on how to operationalize its new dual mandate.

Review and renewal in New Zealand: processes and recent experience

Generally speaking, the fact that PTAs were negotiated between the RBNZ's governor and the Minister of Finance implied that New Zealand's renewal process under the PTA system was broadly similar to the renewal process in Canada, where agreements are negotiated between the Department of Finance and the BoC. However, the governance and timing of the two countries' processes were different. In particular, the process in New Zealand was characterized by a high degree of de facto state dependence that emerged as a consequence of the well-precedented convention that newly elected governments could negotiate new PTAs after taking power, leading to links between the renewal process and domestic political cycle. During negotiations, the fact that RBNZ governors had to sign a PTA before they could be appointed or re-appointed also gave the Minister of Finance somewhat more leverage over the renewal process in New Zealand compared with that in Canada.

Another important point of departure between Canada and New Zealand was that the PTA system in New Zealand did not require that PTAs be preceded by some analogue for the relatively systematic and transparent reviews that have informed each renewal of the Canadian monetary policy framework since 2001. In fact, successive PTAs varied significantly in the extent to which the RBNZ or Treasury provided the negotiating parties with background documents summarizing either staff research on framework questions or the views expressed in the relevant parts of the wider literature; cases where background of this sort was supplied also varied significantly in how much of it was made available to public. It is thus fair to say that the PTA-era review process in New Zealand did not closely resemble the review process in Canada.

Instead, the bulk of the review process in New Zealand has to date comprised a series of three reviews organized by the government and parliament outside the context of the PTA system. The first of these reviews occurred in 2000–01, when the government commissioned Lars Svensson to assess the monetary policy framework's performance over its first decade in operation. In 2007–08, this review was followed by a parliamentary inquiry into the potential framework implications of the strong inflationary pressures the economy experienced over parts of the 2000s, most notably including a significant rise in house prices. The third and final review to date occurred in 2017–18 following an election that led to the formation of a Labour/NZF coalition government. In particular, one of the coalition's first acts in power was to commission an inquiry into several framework questions, chief among them the merits of switching to a dual mandate, which had been a key component in the Labour party's electoral platform (see New Zealand Labour Party 2017).

The terms of reference for the first two of the three reviews noted above were relatively broad, touching on a range of topics outside the main scope of this paper. These included the policies and communication strategies the RBNZ pursued over the periods under review, various governance issues, technical questions on tools and data inputs, and the potential scope for coordination with other policy agencies. The specific conclusions reached regarding the monetary policy framework were relatively supportive of the framework in place, though the reviews identified several areas for improvement. For example, Svensson suggested that inflation expectations would be better anchored if future PTAs specified that the RBNZ aims for the midpoint of its target range. He also argued that future governments should no longer have the flexibility to negotiate PTAs outside the context of a governor's appointment or re-appointment, since the high frequency of PTAs over the framework's first 10 years might have undermined its perceived stability and overall credibility (see Svensson 2001, section 1.5). In addition, the final report of the 2007–08 inquiry noted that some of the RBNZ's commentary about the run-up in house prices over the period under review had led to confusion about how those prices entered into the RBNZ's objectives and monetary policy decisions. For that reason, the inquiry suggested that the RBNZ "consider ways to improve its contribution to public understanding of its monetary policy roles and responsibilities" while endorsing the widely held view that "monetary policy need not target [house and other] asset prices . . . but . . . should be alert to the risks to economic performance arising from the building-up of . . . those prices" (New Zealand 2008, 34–36).

Many of these points were incorporated into the terms of the 2012 PTA, which was the first to stipulate that the RBNZ should, in pursuing its price stability objective, "have regard for the efficiency and soundness of the financial system" (English and Wheeler 2012, 2). The 2012 PTA was also the first agreement to explicitly include asset prices in the set of prices that the RBNZ should monitor, in addition to stipulating that policy-makers should specifically "focus on keeping future average inflation near the 2 per cent target midpoint" (English and Wheeler 2012, 1).[15]

In comparison with the 2000–01 and 2007–08 reviews, the impetus for the 2017–18 review was significantly more political. Labour party officials had spent part of the lead-up to the 2017 election arguing that monetary policy needed to better "adapt to the 'new [post-GFC] normal' of low inflation and stalled growth" (Robertson 2016, n.p.). Several items regarding the monetary policy framework were incorporated into the party's election platform, including a proposal that

[15] All subsequent agreements retained similar instructions, with the one exception that the reference to asset prices had been phased out by the time of the 2018 PTA.

the *Reserve Bank of New Zealand Act* be amended to "broaden the objectives of the Bank . . . to . . . include a commitment to full employment" (New Zealand Labour Party 2017, 1), along with a promise that this and other framework questions would be put to a formal review. Moreover, the NZF party with which Labour formed a coalition government had a long history of criticizing the RBNZ for focusing too closely on price stability at the expense of real outcomes. NZF's representatives in parliament and cabinet thus shared much of Labour's enthusiasm for a thorough reassessment of the monetary policy framework.

For these reasons, the newly formed coalition quickly convened a panel of independent experts to recommend changes to the *Reserve Bank of New Zealand Act* after taking submissions from a variety of sources, including academics and representatives of the private sector, unions and a range of special interest groups.[16, 17] The RBNZ and Treasury also provided extensive submissions of their own, most of which were subsequently made available to the public. In their final report, the panelists recognized that the IT regime "has proved very successful in reducing inflation and in maintaining low and stable inflation" (Snively, Edey and Karacaoglu 2018, 9). However, they argued that

> [i]ncluding an employment objective in the Act would recognise the role that monetary policy plays in stabilising fluctuations in the business cycle and thereby minimizing periods of unemployment. This is important given the significance of employment to welfare and social inclusion. Formalising an employment objective in the Act would make this objective durable, allow for increasing transparency, and underpin the Bank's accountability. (11)

The panel's report also endorsed a government proposal that the RBNZ governor's position as sole decision-maker be replaced with a model under which monetary policy was instead set by a committee. However, panelists noted that this would likely require changes to the PTA system, since the credibility of future PTAs would suffer to the extent that an agreement between the governor and the minister would carry less weight if the governor were simply "first among equals" on a larger committee responsible for making monetary policy decisions. In addition, the panel identified several independent reasons why the PTA system might be overdue for some

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[16] The expert panel specifically consisted of Suzanne Snively, a former RBNZ staffer with a range of experience in the public and private sectors; Malcolm Edey, a professor at the University of Sydney and former executive at the Reserve Bank of Australia; and Girol Karacaoglu, a professor at Victoria University and former executive at the New Zealand Treasury and several commercial banks.

[17] The panel was also tasked with recommending questions that could be considered in a "phase 2" review that is currently underway. As explained in Snively, Edey and Karacaoglu (2018), this phase focuses largely on questions having to do with governance and financial stability policy.

reform, noting that the system "provide[d] no explicit process for robust review of the operational objectives" (25). In contrast, an improved system might "include a requirement for an analytic review programme, a clear role for the Bank to capture their technical expertise, and an opportunity for public input" (28).

Most of the panel's recommendations were endorsed by the RBNZ and the Treasury[18] and incorporated into an amendment to the *Reserve Bank of New Zealand Act* that first took effect on April 1, 2019. Under this amendment, the RBNZ's main "economic objectives" now involve "achieving and maintaining stability in the general level of prices over the medium term" while also "supporting maximum sustainable employment" (New Zealand 2019, 26).[19] In addition, the amended act dispenses with the PTA system and instead stipulates that the Minister of Finance is now responsible for supplying the RBNZ with an operational definition of its new mandate—namely, in the form of a remit issued every five years on which the minister is expected to first seek non-binding advice from the RBNZ. While the first and only such remit to date[20] continued to identify price stability with 2 percent inflation, it also heeded the expert panel's advice not to quantify "maximum sustainable employment," since the concept is "difficult to measure and therefore difficult to agree on" (Snively, Edey and Karacaoglu 2018, 13). Moreover, while the shift from negotiated PTAs to remits set directly by the Minister of Finance would seem to enhance the minister's leverage over the general direction of monetary policy in New Zealand, this leverage is tempered considerably by a requirement that the RBNZ make public its advice on the terms of each remit. A minister who opted to ignore the RBNZ's advice would thus likely face significant political costs.

In addition, the amended *Reserve Bank of New Zealand Act* requires that the RBNZ "review and assess the formulation and implementation of monetary policy at least every five years" (New Zealand 2019, 29), and background documents establish an expectation that these reviews will involve original research and be scheduled so that they can inform the RBNZ's advice on future remits.[21] The amended act can thus be viewed as bringing the governance and structure of the

[18] See Treasury of New Zealand (2018a) for details, especially paragraphs 23 through 37 therein.

[19] Sections 12 and 13 of the amended *Reserve Bank of New Zealand Act* grant the Minister of Finance a reserve power whereby he or she can temporarily re-specify the RBNZ's main economic objectives, though the period for which the modified objectives apply should not exceed 12 months.

[20] Note that the amended RBNZ act made an exception that this first remit would be negotiated between the governor and Minister of Finance, as had been the case for PTAs. As a result, the *next* remit will be the first to which the amended act's full terms apply.

[21] For example, Treasury of New Zealand (2018b) notes that the RBNZ "will undertake a programme of research before providing its advice, but this expectation will not be legislated. Similar to the process at the Bank of Canada,

RBNZ's review and renewal processes into much closer alignment with those of the BoC in two senses: (i) future renewals of the RBNZ's monetary policy framework will now be preceded by thorough and more transparent framework reviews, and (ii) renewals will now occur on a fixed five-year cycle, as opposed to the more state-dependent timing that characterized the PTA system.[22]

The Bank of England

Historical context

The origins of inflation targeting in the United Kingdom can be traced back to the country's exit from the European exchange rate mechanism (ERM) in September 1992. Unlike the situations in Canada and New Zealand, where policy-makers used the years leading up to the adoption of their respective targets to develop a public case for targeting price stability, the need to maintain credibility around the United Kingdom's commitment to the ERM had prevented policy-makers from engaging in public discussion of potential alternative monetary frameworks. As a result, the public had relatively little to inform their expectations about post-ERM monetary policy until early October, when Chancellor of the Exchequer Norman Lamont used an appearance at a conference of the governing Conservative party to announce that the United Kingdom would adopt an inflation-targeting framework. Lamont elaborated on the framework in a letter submitted to the relevant House of Commons committee that same day: policy-makers would target a 1 to 4 percent range, measured in terms of retail prices excluding mortgage payments (RPIX), with the intent of being in the "lower part of the range" (Lamont 1992b, 2) by the end of the current parliament. As for the shape that the framework would take in the longer run, Lamont wrote, "[W]e need to aim at a rate of inflation in the long term of 2 per cent or less" (2).

About three weeks later, Lamont used his annual Mansion House speech to announce some institutional changes intended to help achieve the target. These most notably included a policy that the Bank of England (BoE) would begin producing a regular, public assessment of "the progress being made towards the Government's inflation objective" (Lamont 1992b, paragraph 50), leading to the publication of the BoE's first *Inflation Report* in February 1993. Up to that point, the BoE had not been permitted to make public its inflation forecasts, since the framework under which it then operated allocated rate-setting power to the chancellor rather than BoE officials. As a result, the BoE's monetary policy duties were simply to advise the chancellor and

the research programme would be shaped by a number of key research questions or issues identified by the Reserve Bank each cycle" (19).

[22] That said, the amended *Reserve Bank of New Zealand Act* still lays out a procedure for implementing "off-cycle" renewals in exceptional circumstances. See schedule 2 therein for further information.

then execute his decisions. For these reasons, the introduction of the *Inflation Report* represented a subtle but significant shift of power to the extent that it increased the political costs that the chancellor would likely face if he or she ignored the BoE's recommendations. Over the next few years, Lamont and his successor, Kenneth Clarke, coordinated with BoE governors Robin Leigh-Pemberton and Eddie George on a series of additional reforms that further strengthened the BoE's monetary policy mandate.[23, 24]

The result was a system under which the BoE operated primarily as the government's "disinflationary conscience," to borrow a term coined by Bernanke et al. (1999). Judged by observed inflation outcomes, this system performed relatively well: RPIX inflation fell from an average of 4.7 percent in 1992 down to 3 percent in 1993, then fluctuated in a 2.0 to 3.3 percent band for the next three years. However, measures of inflation expectations and risk premiums pointed to longer-run credibility issues. For example, Haldane (2000) notes that 10-year-forward inflation rates held consistently above 4 percent through to 1997, despite Chancellor Clarke using his 1995 Mansion House speech to announce that the targeting framework would be extended indefinitely, now with a target range of 2.5 percent or less (Clarke 1995). Part of the problem was that the new distribution of responsibilities between the BoE and the Treasury regularly produced public disagreements between the chancellor and the governor, with the latter consistently favouring tighter policy. Moreover, while the *Inflation Report* obliged the BoE to be relatively explicit about the reasoning underlying its recommendations, the absence of an analogous requirement for the chancellor led to speculation about the extent to which political considerations influenced the chancellor's decisions.

Significant doubts about the long-run credibility of the targeting framework lingered until the federal election of spring 1997, which brought the Labour party into power. On the campaign trail, Labour leaders had committed both to continue targeting inflation of 2.5 percent or less and "to ensure that . . . monetary policy is more . . . open, accountable and free from short-term political manipulation" (Labour Party 1997). Within a week of their victory, they announced sweeping reforms that would shift rate-setting power from the chancellor to the newly formed

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[23] For example, the BoE was soon permitted to submit inflation reports to the Treasury in their final form, thus precluding any vetting or censoring by the chancellor. In addition, monthly meetings between the chancellor and BoE governor were formalized and their minutes released on an accelerated schedule with a verbatim account of the governor's opening remarks. See King (1994) and George (1997) for more details.

[24] Though personally supportive of a much fuller and more explicit reallocation of power to the BoE, Lamont viewed a piecemeal approach of this sort as the most that could be achieved at a time when much of the Conservative party remained opposed to independence, crucially including Prime Minister John Major. See Goodhart (2010) for more information.

Monetary Policy Committee (MPC) then consisting of the governor, two deputy governors, two senior members of the BoE staff and four externally appointed experts.[25] Forward inflation rates at all maturities fell dramatically on news of this change and went on to settle in line with the inflation target over the next 18 months. Remarkably, the decision to reallocate rate-setting power seems to have been undertaken without consulting BoE officials. For example, Mervyn King, who was working as the BoE's chief economist at the time, described it as "a complete surprise" (*Financial Times* 2007). Governor George was informed of the decision only a day before its announcement to the public (see King 2007).

The Labour reforms were first implemented on a de facto basis in summer 1997, then formalized in the 1998 *Bank of England Act*. While they granted the BoE operational independence in the sense of Debelle and Fischer (1994),[26] discretion over the objectives of UK monetary policy remained a prerogative of the government. In particular, the act identified the BoE's mandate as to "maintain price stability and subject to that, support the economic policy of Her Majesty's Government" (HM Government 1998, 5), but the term "price stability" was crucially left undefined. Instead, it would be specified by the chancellor in an annual written remit for the BoE. Chancellor Gordon Brown used the first such remit to assign the BoE a point target of 2.5 percent RPIX inflation. He also instructed the BoE to send him an explanatory open letter should inflation deviate from target by more than 1 percentage point, though he stressed that the implied thresholds "do not define a target range" (Brown 1997, 2).[27]

Subsequent remits extended these policies through to 2003, when Brown opted to redefine the target in terms of a harmonized price index that brought BoE practice into alignment with that of the European Central Bank (ECB), a decision that seems to have been undertaken against the BoE's advice at a time when the government was actively exploring the possibility of eurozone membership (see Paterson 2003 and Thornton 2003). Since the harmonized index, then known as HICP but later renamed CPI, was known to run somewhat lower due to differences in coverage and aggregation, the new definition was paired with a 50-basis-point reduction in the point target, along with a parallel shift in the surrounding thresholds. The resulting configuration—that

[25] The MPC's composition has evolved over time and currently consists of the governor, three deputy governors, the BoE's chief economist and four externally appointed members. A representative of the Treasury may also attend MPC meetings as a non-voting observer.

[26] The act *s*till allocates the Treasury a reserve power to overrule the MPC and temporarily "give the Bank directions with respect to monetary policy if . . . required in the public interest and by extreme economic circumstances" (HM Government 1998, 9). This power has not been exercised to date and is circumscribed by a process that obligates the Treasury to seek approval from Parliament within a certain period.

[27] In addition, he indicated that the BoE should produce a follow-up letter should a given deviation continue to exceed 1 percentage point after three months' time.

is, a 1 to 3 percent band around a 2 percent CPI inflation target—remains in place to this day, as does the remit system itself. In fact, the latter was expanded in the 2010s following the formation of the BoE's Financial Policy Committee (FPC) and Prudential Regulation Committee (PRC), both of which now receive their own remits from the Treasury.[28]

Review and renewal in the United Kingdom: processes and recent experience

The fixed annual frequency of MPC remits distinguishes the BoE renewal process from that of the BoC, which has settled on a five-year cycle. The government-led nature of the BoE process is another key distinguishing feature relative to the agreement-based process in Canada. In many ways, the governance and structure of the BoE renewal process arguably lie closer to those of the RBNZ's PTA-era renewal process: remits occur with sufficient frequency to allow a new government to quickly make its mark on the monetary policy framework or an ongoing government to quickly adjust the framework following the appointment of a new governor.

Another respect in which the BoE renewal process can be placed closer to the PTA-era RBNZ experience is that most BoE renewals are not accompanied by a thorough and transparent review of the monetary policy framework. In the first decade following BoE independence, framework review instead occurred outside the context of the remit system and took the form of a series of parliamentary reports on UK monetary policy, several of which touched on select framework issues (see, e.g., House of Commons Treasury Committee 2007). The year 2013 then marked a shift to a Treasury-led review process, with Chancellor George Osborne opting to combine that year's remit with a thorough framework review, whose terms of reference were set and executed by the Treasury itself. To date, the 2013 remit is the only UK renewal formally paired with a review of this sort.

The timing of the 2013 review owes largely to the BoE's implementation of unconventional monetary policies to provide additional stimulus at a time when the policy rate was at or near the ELB. Since these policies were likely to remain in place for an extended period, an in-depth review of the framework seemed warranted, especially since Mark Carney would soon replace Mervyn King as governor. At the same time, the fact that the above-noted FPC would soon start operating on a permanent statutory basis created a separate need to explore the optimal terms of the new committee's relationship with the MPC. More generally, the 2013 review afforded a

[28] The FPC and PRC were both created in the aftermath of the GFC as part of an expansion of the BoE's mandate to include a range of financial stability considerations. In fact, the formation of these committees represented something of a return to older practice, since responsibility for bank supervision had fallen under the BoE's mandate prior to the 1998 *Bank of England Act*.

good opportunity to reflect on the GFC and its aftermath, drawing from the UK perspective and from the experience of other comparable jurisdictions.

The above-noted fact that the agenda for the 2013 BoE review was set and executed by the Treasury is an important distinction from the review process in Canada, where the reviews accompanying the four most recent renewals of the Canadian monetary policy framework have all been led by the BoC. Another key distinction between the two countries' review processes is that the UK process has to date involved relatively little of the original research that typifies the Canadian process.

Despite these differences, the 2013 BoE review touched on many topics that also figured prominently in BoC reviews around the same time, often reaching broadly similar conclusions. For example, the BoE review document devoted considerable attention to the theoretical benefits of PLT, along with those of nominal GDP targeting, but stressed that these "depend on key assumptions about the determination of inflation expectations"—that is, "households and businesses must be forward-looking, must fully understand the regime and must consider it credible" (HM Treasury 2013a, 37). This was especially problematic in view of the Treasury's assessment that alternative frameworks would entail "significant communication and credibility challenges" (38), while "any move to a different monetary framework would carry the risk of de-anchoring inflation expectations" (39).

In addition, the 2013 review highlighted the importance of flexibility in the horizon at which policy-makers aim to return inflation to target, especially following large shocks that entail "significant trade-offs between the speed [of this return] . . . and the consideration that should be placed on the [short-run] variability of output" (HM Treasury 2013a, 4). In fact, trade-offs of this sort were a key feature of the UK experience at the time, since the country had faced an extended period of high inflation during and after the GFC due to a combination of a steep depreciation of pound sterling and various cost shocks. The review also identified financial stability considerations as another possible reason for tolerating temporary deviations from target, though it recognized that macroprudential policy had a larger and more important role to play in containing potential imbalances:

> Circumstances may . . . arise in which attempts to keep inflation at the inflation target could exacerbate the development of imbalances that . . . represent a potential risk to financial stability. The FPC's macro-prudential tools are the first line of defence against such risks, but in these circumstances the [Monetary Policy] Committee may wish to allow inflation to deviate from target temporarily. (8)

Regarding the issue of unconventional monetary policy, the 2013 review made a strong distinction between forward guidance and balance sheet tools, including the quantitative and credit easing policies that the BoE was then implementing, mainly as part of the Asset Purchase Facility (APF) introduced in 2009. This distinction was important because tools in the latter category "risk blurring the line between monetary and fiscal responsibilities" (57). Since these effects "raise[d] new issues of governance and accountability" (5), the review argued that the government should take the lead in "establishing clear principles, processes and potential measures of success" (58), as had been the case under the APF, which specified that changes in the purchasing ceiling and criteria for asset eligibility were subject to Treasury approval. In contrast, the review identified forward guidance as "a matter subject to the MPC's operational independence in setting policy" (5).

Given that both documents were produced by the Treasury, it should not be surprising that many of the conclusions reached in the 2013 review were incorporated into that year's remit. The remit ultimately confirmed that the inflation target would remain unchanged but stressed that the BoE should continue to pursue it in a flexible manner regarding both output and financial stability. As for unconventional policies, the MPC was instructed "to work with the Government to ensure the appropriate governance arrangements are in place to ensure accountability in the deployment of such instruments" (HM Treasury 2013b, 9). In addition, the remit requested that the committee release its own assessment of the merits of forward guidance in an upcoming *Inflation Report*, which led to the BoE's first experiment with state-contingent guidance later that same year.

As for the future of the UK review and renewal processes, the chancellor's 2013 remit letter envisioned that another government-led review would occur by the end of 2019. Although this second review has not yet taken place, Governor Carney used one of the last speeches of his term to launch a year-long BoE research program dedicated to monetary policy framework issues (see Carney 2020). This program could mark a shift toward a review model closer to that of the BoC, both in the sense of involving original research and in the sense of granting the central bank a greater role in the overall review process.

The Sveriges Riksbank

Historical context

Like the BoE, the Sveriges Riksbank traces the origins of its inflation target back to the turbulence witnessed in European exchange markets in the early 1990s. More specifically, a November 1992 decision to abandon an increasingly tenuous peg of the krona marked the end of a long history of operating under various fixed exchange rate regimes, creating an urgent need for a new anchor around which Swedish monetary policy could be organized. As was the case in the United Kingdom, the need to preserve the peg's credibility as long as it remained in effect had precluded much public discussion of alternative monetary policy frameworks. As a result, many Swedes initially expected that the country would soon return to some form of peg, as had been the case following a series of devaluations in the 1970s and 1980s. Over the next few weeks, policy-makers solicited advice on replacement regimes from multiple sources, including the RBNZ and the BoC.[29] After less than two months' deliberation, the Riksbank announced on January 15, 1993, that monetary policy would now be oriented toward a target of 2 percent total CPI inflation, with a tolerance of plus or minus 1 percentage point. The target was crucially stated to apply beginning only in 1995, a date that seems to have been chosen largely to accommodate the first-round price effects of the large depreciation that the krona experienced after first being allowed to float.

That the new target was announced by the Riksbank itself rather than the government should not be interpreted to imply that the Riksbank enjoyed a high degree of independence when the new framework was being decided. On the contrary, the institutional arrangements in place created significant scope for political involvement in monetary policy. In fact, it was not uncommon for members of parliament to sit directly on the board that was then responsible for most monetary policy decisions. More specifically, monetary policy decisions were at the time made by a group of eight people: four political appointees selected by the party (or coalition) in power, three additional political appointees, and a governor whom the other seven appointed and could replace with relative ease (as emphasized by, e.g., Svensson 1995). Moreover, many decisions were made by majority vote, with the tie-breaking vote assigned not to the governor but instead to a chair selected from among the political appointees. As a result of this decision-making structure, the Riksbank could not have announced the inflation target without a significant measure of political support.

An equally important implication of the decision-making structure in place at the time was that a change in government could easily lead to the target's being vitiated, if not abandoned entirely. This was especially important given that the target would officially begin to apply only after an election that was scheduled to occur by autumn 1994 at the latest. As the election approached, it seemed increasingly likely that power would shift to a new government led by the Social Democrats. To assuage concerns about whether they would allow the targeting framework to

[29] In fact, Andersson and Jonung (2017, 2018) note that Riksbank staff reached out to their counterparts in Ottawa on the very day that the krona was first allowed to float, leading to a delegation being dispatched within a week.

remain in place, the Social Democrats made a campaign pledge that they would not alter the framework nor replace the governor, and both these commitments were ultimately honoured following their minority victory of September 18, 1994.

Though these signs that the inflation target enjoyed broad political support went some way toward improving its credibility, an arguably more important contribution came from the changes in fiscal policy that soon followed. At the time, public finances were widely viewed as being on an unsustainable path, especially considering the extraordinary steps the government had taken to protect the financial sector during a recent banking crisis. Through the latter half of the 1990s, policy-makers thus undertook an aggressive fiscal consolidation, along with various reforms aimed to ensure longer-run sustainability, including an annual spending cap, a medium-run surplus target and the introduction of a centralized, top-down budgeting process.[30] As emphasized by Giavazzi and Mishkin (2006), these fiscal improvements likely contributed to a broad reduction in Swedish inflation expectations and risk premiums in the late 1990s.[31]

The growing credibility of monetary policy also had the benefit of increasing support for making the Riksbank a more independent institution. This is important because a 1994 referendum saw a majority of the electorate vote in favour of membership in the European Union, a prospect that would make Sweden subject to the Maastricht Treaty and its stringent terms regarding central bank independence and governance. As parliament began debating new governance structures, a broad coalition emerged in favour of reforms under which rate-setting powers would be allocated to an Executive Board consisting of the Riksbank governor and five full-time deputy governors. This structure was eventually established as part of an amendment to the *Sveriges Riksbank Act* that took effect in 1999.

In addition to instrument independence as described in Debelle and Fischer (1994), the amended act provided for a high degree of goal independence. In particular, the act identified the Riksbank's mandate as being only to "maintain price stability" and "promote a safe and efficient payment system" (Sveriges Riksbank 2019),[32] leaving it to the Riksbank to supply a precise definition of the term "price stability." One of the newly formed Executive Board's first acts was thus to confirm that the Riksbank would continue targeting 2 percent CPI inflation within a 1 to

[30] See Flodén (2013).
[31] Fiscal improvements also seem to have helped enable the more stimulative policies that the Riksbank began pursuing in 1996. In fact, Deputy Governor Lars Heikensten used a speech in early 1997 to identify this stimulus as "something for which our thanks are very much due to fiscal policy." In contrast, Berg and Gröttheim (1997) argue that fiscal concerns likely motivated the relatively tight policies that the Riksbank implemented over much of the 1993–95 period.
[32] For these and all other quotes from the *Sveriges Riksbank Act*, we rely on an unofficial translation of the act posted on the Riksbank's website.

3 percent tolerance band, a policy that remained in effect through to 2010, when the framework underwent changes that we describe below.

Review and renewal in Sweden: processes and recent experience

A consequence of the Riksbank's goal independence is that the Riksbank lacks an analogue for the Treasury remit that drives the renewal process for the BoE, likewise the agreement with the Department of Finance that underpins the renewal process for the BoC.[33] Many renewal decisions that would require inputs from the government in other jurisdictions can be made directly by the Riksbank Executive Board, which to date has operated under a system where the current monetary policy framework is understood to remain in effect until policy-makers indicate otherwise.[34]

As for the Swedish review process, it has largely revolved around a series of external evaluations commissioned by the Finance Committee of the Swedish parliament.[35] Three such evaluations have taken place to date. The first was carried out by Francesco Giavazzi and Frederic Mishkin (2006), who focused on the period 1995–2005 and thus covered the first 10 years of the 2 percent target. Following their final report, the Finance Committee announced an intention that similar evaluations would occur every four years, leading to a report by Charles Goodhart and Jean-Charles Rochet (2010) focusing on the 2005–10 period, including the Riksbank's experiences during the GFC and its immediate aftermath. Marvin Goodfriend and Mervyn King (2016) more recently covered the years 2010–15, a period during which the Riksbank struggled with persistently low inflation and eventually began experimenting with quantitative easing and negative interest rates. Though a fourth external evaluation has not yet been undertaken for reasons we expand on below, this history implies that the Swedish review process can generally be described as a time-dependent process that legislators are responsible for leading, though execution is delegated to outside experts.

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[33] In fact, any potential role for the Swedish Ministry of Finance is highly circumscribed by the fact that Swedish law makes a strong distinction between agencies that answer to government as opposed to parliament, with the Riksbank in the latter category.

[34] Since 2006, a document entitled *Monetary Policy in Sweden* has served as the most authoritative public account of the Executive Board's interpretation of the Riksbank mandate and the framework within which that mandate is pursued (Sveriges Riksbank 2006). The document is updated periodically to reflect framework changes (Sveriges Riksbank 2010, 2017b), and key parts of it are excerpted in the preamble of the Riksbank's *Monetary Policy Report*.

[35] The Finance Committee is the main body responsible for official Riksbank oversight. It also conducts its own annual assessments of Swedish monetary policy. While these assessments sometimes touch on framework issues, their main focus is more on the policy decisions made over the period under review, taking the Riksbank's overall framework and mandate as given.

The three evaluations have been carried out in broadly similar ways. The process begins with a specification of terms of reference by the parliament's Finance Committee. The external evaluators are then given about a year to prepare their review. During that time, they make a few trips to Sweden, where they meet with a range of experts and stakeholders, including political leaders, journalists, academics, officials from the Riksbank and other government agencies, and representatives from the unions and private sector. Key stakeholders are also invited to make written submissions. Completed evaluations contain many recommendations, to which the Riksbank and other affected agencies make formal responses. The Finance Committee then delivers a final report to parliament.

Compared with the review process in Canada, the Riksbank's external evaluations have the distinctive feature that their terms of reference are relatively wide-ranging. In addition to the mandate and monetary policy framework, the external evaluators are often expected to weigh in on the Riksbank's communications strategy, modelling and forecasting tools, and a variety of other issues. The evaluators are also expected to assess the Executive Board's policy decisions during the period under review. Another factor that distinguishes the Riksbank's review process from that of the BoC is that the Riksbank evaluators have not to date been asked to undertake original research as part of their work. Instead, they rely mainly on information gathered during their fact-finding trips, coupled with their own expertise, experience and knowledge of the wider literature.

Despite these differences, the Riksbank evaluations share many themes in common with reviews in Canada and other jurisdictions. For example, the formulation of the inflation target was a key theme of the review by Giavazzi and Mishkin (2006), who endorsed the 2 percent target and 1 to 3 percent tolerance band (though they argued this objective would better be achieved in the context of a PLT or average-inflation-targeting framework). Though subsequent evaluations have not revisited the level of the inflation target, all three evaluations to date have highlighted the practical challenges associated with defining it in terms of total consumer price index (CPI). This is because Statistics Sweden computes total CPI in a way that includes mortgage rates as a component in the cost of housing, thus creating some potential for misleading signals following shifts in the policy rate. The Giavazzi-Mishkin (2006) and Goodfriend-King (2016) evaluations both viewed this issue as problematic enough to recommend shifting to the consumer price index with a fixed interest rate (CPIF) measure, an alternate index that aims to control for these effects.[36] Goodhart and Rochet (2010) took the more balanced view that the Riksbank should

[36] The nomenclature has evolved somewhat over time. At the time of the Giavazzi-Mishkin evaluation, CPIF was known as "UND1X."

continue “using the CPI index as their target for medium term analysis, while using the CPIF index for assessing the shorter-term progress” (73).

The relationship between monetary policy and financial stability emerges as another key theme and an area where successive evaluators’ views seem to have evolved along lines similar to those reflected in contemporaneous BoC reviews. For example, the Giavazzi-Mishkin (2006) evaluation viewed the issue as having mainly to do with asset prices and endorsed the then-conventional wisdom that “[a] flexible inflation targeting regime . . . should not . . . respond to them over and above their effect on employment and inflation” (77). In contrast, the two subsequent evaluations noted that the relevant imbalances also included excess credit expansion as well as misaligned asset prices, and they further recognized that monetary policy might in special circumstances have a role to play in containing those imbalances, though macroprudential policy was a much more effective tool.

The considerable attention given to monetary-financial nexus issues in the two most recent evaluations occurred largely because of a highly publicized episode over the 2010–13 period, when concerns about imbalances in the household sector led a majority of the Executive Board to favour policies tighter than those preferred by a vocal minority. This impasse stemmed, in part, from different interpretations of the *Sveriges Riksbank Act*, which does not explicitly identify financial stability as part of the Riksbank’s mandate, though the duty to “promote a safe and efficient payment system” (Sveriges Riksbank 2019) has sometimes been viewed as having this implication.[37] Moreover, the act makes no provision for the Riksbank’s deploying loan-to-value limits or other tools to mitigate a potential financial imbalance. Instead, these tools were mainly the responsibility of the Swedish Financial Supervisory Authority, an institution that was at the time struggling with ambiguities in its own mandate. For these reasons, the Executive Board majority may have felt they were operating in what Goodhart and Rochet (2010) characterized as a “vacuum in policy” (74).

In any case, the two most recent evaluations concluded that the situation warranted a thorough rethinking of the Swedish financial stability framework and clearer articulations of the way the relevant powers and duties should be distributed across agencies and the extent to which financial stability considerations should influence monetary policy decisions. Goodhart and Rochet (2010), in particular, stressed that a more effective macroprudential framework would “enable the decision on interest rates to concentrate . . . more closely . . . on the implications of

[37] See Sveriges Riksbank (2013) for further details.

that instrument for future output and inflation gaps" (70), while Goodfriend and King (2016) cautioned that

> there may well be imbalances . . . for which macroprudential actions are inadequate to ensure an adjustment towards full employment with price stability, . . . [thus making it occasionally] appropriate for the Riksbank to deviate from the normal and rather narrow focus on meeting the inflation target [within the usual target horizon]. (101)

Other important issues stressed in the external evaluations have to do with the nature of the Swedish renewal process itself. For example, Goodfriend and King (2016) noted that the high degree of goal independence enjoyed by the Riksbank might over time undermine the credibility and perceived political legitimacy of the inflation target. For this reason, they recommended an alternative renewal process under which the Swedish parliament would specify the inflation target based on a recommendation from the Minister of Finance.

Several of the external evaluators' recommendations have gone on to inform important changes in the Swedish monetary policy framework, though some speak to operational aspects of the framework that lie outside the main scope of this paper. For example, points made in the Giavazzi-Mishikin (2006) evaluation helped to inform a 2007 decision to start reporting the expected path of the policy rate based on the Riksbank's own forecasts, as opposed to market-implied forward rates. In terms of more fundamental features of the framework, a 2017 decision to redefine the target in terms of CPIF inflation stemmed in part from the arguments made in all three evaluations concerning the relative merits of CPI and CPIF (see Sveriges Riksbank 2017a).

At times, the framework has also been adjusted to accommodate changes not specifically recommended by an external evaluation. For example, this seems to have been the case for a 2010 decision to abandon the 1 to 3 percent band surrounding the target[38] and a later decision to reinstate that band around the time of the shift to CPIF. When re-adopted, the band was renamed a "variation band," rather than "tolerance band," to emphasize its primarily pedagogical purpose as a device "to illustrate that monetary policy is not able to steer inflation in detail . . . [and thus] that inflation normally varies around the target" (Sveriges Riksbank 2017b, 1).

Such changes in the definition of the inflation target or status of the surrounding band involve the interpretation of the "price stability" mandate and thus could be implemented by the Riksbank alone. In contrast, some of the broader issues raised by the external evaluators, especially concerning financial stability and its relation to monetary policy, could not be

[38] Sveriges Riksbank (2010) provides more information.

addressed without action from the government and legislature. In this respect, the external evaluations seem to have played a useful role in providing credible outside advice on difficult questions that governments may be slow to act on. In particular, the Goodhart-Rochet evaluation partly motivated a 2013 government decision to allocate primary responsibility for macroprudential policy and tools to the Swedish Financial Supervisory Authority,[39] while the Goodfriend-King evaluation played a role in the 2016 formation of a parliamentary inquiry that was tasked with recommending comprehensive changes to the Riksbank's governing legislation.

In lieu of a fourth external evaluation, this inquiry has occupied most of the Swedish parliament's recent framework review activities. While a full review of the final report the inquiry released in 2019 lies outside the scope of this paper, it included several noteworthy proposals regarding the *Sveriges Riksbank Act* and monetary policy framework.[40]

First, while the report affirmed the current specification of the inflation target, it proposed that a new *Sveriges Riksbank Act* stipulate that any future changes to the inflation target be put forward by the Executive Board of the Riksbank but then be approved by parliament. While the Riksbank has up to now had a high degree of goal independence, such a proposal would limit this independence going forward. Second, the report proposed that the new act also expand the Riksbank's formal mandate to include a duty to "contribute to a balanced development of production and employment . . . without setting aside the price stability objective" (Government Offices of Sweden 2019, 66). While this does not go so far as to establish a dual mandate, it clarifies what factors the Riksbank should also consider in its flexible inflation forecast targeting framework. Third, the report addressed the monetary-financial nexus issues raised in the Goodhart-Rochet and Goodfriend-King reports by not recommending that the new act clearly identify financial stability as another secondary objective to be pursued without prejudice to price stability. Finally, the report proposed a range of changes and clarifications regarding the Riksbank's other responsibilities, powers and legal status, some of which addressed other points made in the external evaluations.

To summarize, the governance and structure of the review and renewal processes in Sweden are distinct from approaches in other jurisdictions, especially given that it is the Swedish parliament that sets the terms of reference of the public review, and more notably that the review is conducted by external examiners rather than the central bank or government. Because the Riksbank has a high degree of goal independence, many renewal decisions, including some on whether to incorporate the recommendations of the external reviewers, can be made directly by

[39] For details, see pp. 39–40 of Sveriges Riksbank (2013b), along with the documents referenced therein.
[40] See Government Offices of Sweden (2019) for more information.

the Riksbank, whereas other framework decisions require action from the government or parliament.

The US Federal Reserve system

Historical context

The Federal Reserve system was established in 1913. Its monetary framework has changed over time, but the most momentous recent changes came with the collapse of the Bretton Woods pegged exchange rate system in 1971. A combination of factors—the disappearance of a pegged exchange rate as the nominal anchor for monetary policy and two major adverse supply shocks related to increases in the price of oil driven by the Organization of the Petroleum Exporting Countries—produced an economic environment of rising unemployment and double-digit inflation that was dubbed "stagflation." In response to these worsening economic circumstances, two laws were enacted that greatly affected the US monetary policy framework. The 1978 *Full Employment and Balanced Growth Act,* also known as the "Humphrey-Hawkins Act," amended the 1946 *Employment Act* to assign the federal government responsibility for achieving "full employment . . . and reasonable price stability." The 1913 *Federal Reserve Act* was also amended in 1977 to specify the objectives of monetary policy to be "maximum employment, stable prices and moderate long-term interest rates." In practice, the third goal has been de-emphasized because long-term interest rates can only remain low in a stable macroeconomic environment consistent with the first two goals. These two goals of maximum sustainable employment and price stability are seen as being equal and form what has come to be known as the "dual mandate" of the Federal Reserve for monetary policy (Judd and Rudebusch 1999; and Mishkin 2007).

Interpreting and implementing the dual mandate

As was the experience with some of the other central banks reviewed in this paper, the Federal Reserve (the Fed) faced serious difficulties implementing its monetary policy framework in a credible time-consistent manner in the aftermath of the Bretton Woods system collapse. Consequently, the monetary policy response to initial inflationary pressure stemming from Vietnam War spending and subsequent oil price shocks resulted in a rise in inflation to above 10 percent over the 1970s. Inflation expectations rose concomitantly. As in many other jurisdictions, policy-makers tried various means to reduce inflation gradually without significant disruption to economic activity, including wage and price controls and limiting money supply growth. This gradualist approach, however, failed because the monetary policy framework was neither clear nor credible. Hence, these approaches did not significantly reduce inflation expectations.

Paul Volcker became the Chair of the Board of Governors of the Federal Reserve System in August 1979. Given that inflation was in the double digits, Volcker saw reducing inflation as his primary objective. Moreover, given that inflation expectations had been become entrenched at a high level, he knew that the credibility of the Fed's policy was critical to reducing these expectations and inflation itself. To establish this credibility, the Federal Open Markets Committee (FOMC) showed the willingness to take the necessary steps to break the back of inflation expectations at the cost of a significant recession. Most notably, the FOMC raised the federal funds rate steadily, reaching 20 percent by May 1981, thereby causing a sharp downturn in economic activity and a deep recession in 1981–82, when the unemployment rate approached 11 percent. Inflation fell sharply to roughly 5 percent.

Especially in the early phases of this disinflationary episode, attention was paid to growth in the money supply as an intermediate target for operational purposes (Goodfriend and King 2005). Volcker, however, felt this was not the most effective means to influence inflation expectations and effectively created a new nominal anchor based on the expectation of low and stable inflation. He defined the Fed's objective in expectational terms, stating that "people should not be planning on inflation" (Hetzel 2008, 163). His successor as Chair, Alan Greenspan, would in 2004 give a similar definition: "Inflation is deemed to have been eliminated when the expected change in prices ceases to be a factor in individual and firm decision making."[41] Despite not articulating precisely the price stability goal of monetary policy, the Fed's achievement of relatively low and stable inflation over the remainder of the 1980s and through the 1990s increased its credibility, and inflation expectations declined and became better anchored at a lower level. Consequently, both nominal and real economic stability rose in the United States, and this experience became known as the "Great Moderation." The increased focus on low and stable inflation in monetary policy frameworks in the United States and elsewhere contributed to this moderation.

Over time, the dual mandate became more explicit in staff work and in FOMC discussions. In particular, estimates for the natural rate of unemployment (or later the unemployment rate consistent with maximum sustainable employment) were regularly generated and discussed internally. In addition, the FOMC's numerical estimates of the inflation target consistent with price stability converged to 2 percent by the end of the 1990s (Hetzel 2008, chapter 15).

[41] See Hetzel (2008, chapter 15) for further details on this highly qualitative view of price stability, including an episode from a July 1996 FOMC meeting during which Greenspan refused to provide a precise numerical value for the inflation target when pressed by Janet Yellen.

The increasing use of these numerical targets for the dual mandate spawned the development of compact policy rules, the most famous of which was the Taylor Rule (see Taylor 1993), which posited that the policy rate should respond to deviations of inflation and unemployment (or output) from target levels.[42] Greenspan eschewed these numerical targets and the derived rules because he believed that while they provided some guidance, they limited the Fed's discretion, which was critical in a rapidly changing economic environment. In particular, he argued that policy rates should often deviate from the rates prescribed by rules to manage risks to the outlook. Greenspan often pointed to elevated asset prices—a clear risk to financial stability—as a possible justification for such a deviation (Hetzel 2008, chapter 18).

As in other jurisdictions, the Fed has considered the implications of financial instability concerns in the conduct of monetary. The prevailing view during the Great Moderation period was that monetary policy should not react to financial pressures and that asset prices and other financial variables should be considered only to the extent they affect the achievement of the dual mandate goals.[43] The debate in the related literature often focused on the issue of how monetary policy should react to perceived asset price "bubbles": Should monetary policy "lean" versus "clean"? Peek, Rosengren and Tootell (2016) find evidence that financial instability concerns did affect FOMC behaviour to the extent that interest rates were further reduced when there was an asset price "bust," which was suggestive of the "clean" response.

Long-term goals of monetary policy

Because the two dual-mandate goals of US monetary policy are not precisely defined in legislation, the successful adoption of explicit inflation targets by a growing number of major central banks since the early 1990s eventually sparked interest in a more quantitative reinterpretation of the dual mandate among Fed officials (see, e.g., Bernanke 2005). This interest culminated in the release by the FOMC of a one-page "Statement on Longer-Run Goals and Monetary Policy Strategy" in January 2012, which specified that the FOMC viewed a long-run goal of 2 percent inflation as being consistent with the Fed's price stability mandate.[44] Regarding the second goal of maximum sustainable employment, the statement recognized that this goal was largely determined by non-monetary factors and that any numerical estimate of it (that is, the

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[42] A recent estimate of a policy rule by Fuhrer et al. (2018) indicated that from the 1970s to the 1990s the Fed put decreasing weight on unemployment relative to inflation. However, the weights were found to have become more balanced in the 2000s before the GFC.

[43] See Peek, Rosengren and Tootell (2016) and Bernanke and Gertler (1999). A more interventionist view is offered by Stein (2012), who argues that monetary policy can be effective in mitigating financial instability concerns in the absence of the appropriate macroprudential tools.

[44] The long-run inflation goal is defined based on the annual change in the price index for personal consumption expenditures (PCE).

unemployment rate consistent with maximum sustainable employment or "the longer term normal rate of unemployment") is necessarily uncertain and subject to revision. However, the FOMC felt obligated to include one such estimate to give this goal the same standing as the price stability goal. Consequently, in the January 2012 statement, FOMC participants' estimate of the longer-run normal rate of unemployment was specified as a range of between 5.2 and 6 percent. The statement also mentioned a "balanced approach" to achieving the two dual-mandate goals, implicitly recognizing that (i) the two goals carry equal weight and (ii) in normal times the Fed has only one instrument: the federal funds rate.

In the discussion of the statement in the FOMC minutes for the January 2012 meeting, then chair Ben Bernanke noted that "this statement does not reflect and should not be represented as a change in the underlying policy approach of the FOMC" (Board of Governors of the Federal Reserve System 2012, 43). He explained further that the purpose of the statement was "to increase our transparency and accountability by making our communication clearer to the public" (43) and that he viewed the statement "basically as a communication device" (48). Governor Janet Yellen, then chair of the FOMC's subcommittee on communications, which was responsible for drafting the statement, noted that "the statement has been designed as an overarching set of principles that is intended to withstand the test of time" (45). She went further to add that the "statement needs to be a living and breathing document" and that the "FOMC intends to reaffirm these principles at each organizational meeting" (47) held annually in January.

The statement has been reaffirmed with minor revisions each year since 2012, with the exception of 2020, when the statement was cancelled to accommodate a broader framework review on which we elaborate below. Each year, the FOMC has updated its current estimate of the "longer run normal rate of unemployment," which in 2019 was 4.4 percent, while the inflation goal has remained unchanged at 2 percent. In 2016, the FOMC adjusted the statement's language modestly to emphasize that the inflation goal is symmetric around the 2 percent target.[45]

New review process

At a conference held at the Brookings Institution in January 2018, President Eric Rosengren of the Federal Reserve Bank of Boston, in commenting on a presentation by former BoC Deputy Governor John Murray on the Canadian renewal process, remarked that the Fed's preparations for updates to the "Statement on Longer-Run Goals and Monetary Policy Strategy" do not represent a review process equivalent to the one in Canada (Murray 2018, Rosengren 2018).

[45] The maximum sustainable employment goal is also presumed to be symmetric. See, for example, Fuhrer et al. (2018).

Instead, the process consists of a "private discussion," which represents "a relatively small part" of the annual January FOMC meeting. In particular, and unlike Canadian framework renewals, statement updates are not informed by multi-year research agendas and do not entail comparable degrees of transparency. Rosengren argued further that given significant changes in the economic environment, a more thorough review of the Fed's dual mandate may be warranted. He concluded by saying,

> the Bank of Canada has a process and as I have gotten older, I've gotten a better appreciation of the fact that having these kinds of processes and governance actually does matter. It gives you an opportunity to have discussions that you might not have otherwise. It is also a good way of communicating with the public more broadly about what you're doing, why you're doing it? . . . So, I think these are incredibly important aspects of central banking. (Rosengren 2018).

On November 15, 2018, the Fed announced that in 2019 it would conduct a review of "the strategies, tools and communication practices it uses to pursue its congressionally-assigned mandate of maximum employment and price stability" (Board of Governors of the Federal Reserve System, 2018). This would include alternative approaches to achieve the dual-mandate goals, alternative tools that could be used when the federal funds rate is at the ELB, and potential improvements to the Fed's communication practices that would enhance policy effectiveness. Part of the motivation for the review was to stave off increasing political pressure within Congress for more oversight of Fed conduct (see, e.g., Powell 2015; and Congressional Research Service 2018). The review would not recommend a change in the long-run inflation goal of 2 percent or changes in the legislation governing the Fed. Since the announcement of the review, various "Fed Listens" conferences and other public events have been held at the regional Federal Reserve banks to hear from a wide range of stakeholders, including from civil society, academics and other current or former policy-makers.[46] The information and perspectives gathered will be assessed and reported on. In addition, the preparation of internal memoranda was planned for the first half of 2020 on various topics, with the goal of producing a summary document with recommendations.

In summary, while the governance and structure of the Fed's review and renewal processes have been largely internal to the Fed, the 2012 release of the "Statement on Longer-Run Goals and Monetary Policy Strategy" represented an important opening-up of the renewal process, and the

[46] The signature conference, Monetary Policy Strategy, Tools and Communications Practices, was held at the Federal Reserve Bank of Chicago on June 5–6, 2019. The conference was live-streamed, and this video along with papers and session summaries are available on the Fed's website. Fed Vice-Chair Richard Clarida has also been giving a series of speeches with the same title as this conference, providing updates on the progress of this review.

scope of the review process announced in 2019 broke new ground in terms of active engagement with a wider range of stakeholders from civil society to help achieve public transparency and accountability. Academics have also provided original research. It remains to be seen how this wider, more elaborate review process will factor into renewal decisions going forward and whether it will be repeated on a regular basis.

4. Key findings and lessons learned

Since the early 1990s, many jurisdictions have adopted monetary policy frameworks with explicit inflation targets as core components. These frameworks have changed over time, partly as a consequence of the various framework review and renewal processes employed across these jurisdictions. The key question is not whether central banks can or should change their monetary policy frameworks, but rather what approach they should take to (i) review their frameworks to assess any gaps or weaknesses and (ii) renew those frameworks to implement the necessary changes. In particular, should these changes be made episodically when weaknesses become apparent or should they be made as a consequence of regular and deliberate review and renewal processes?

The main purpose of this paper is to draw lessons on best practices for review and renewal of the monetary policy framework from the experiences of different countries. To this end, we use this section to compare review and renewal processes for the sample of advanced economies discussed above: Canada, New Zealand, the United Kingdom, Sweden and the United States. See charts 1 through 5 for a summary of these countries' recent histories in terms of realized and targeted inflation outcomes.

Before assessing the major differences in the review and renewal processes we have described in the preceding sections, it is worth highlighting three key observations.

First, changes to monetary policy frameworks can occur frequently, driven in part by the review and renewal processes in place. For example, a comparison of charts 1 and 2 below indicates that material framework changes have been much more frequent in New Zealand than in Canada, where renewals have tended to focus on refining the implementation of the monetary policy framework.

Second, the review and renewal processes in these jurisdictions are very heterogeneous across a number of dimensions that we examine in greater detail below. At one end of the spectrum, processes can be relatively technocratic and time-dependent, often placing central banks in leading roles. At the other end of the spectrum, processes can be relatively political and state-dependent, with treasuries playing larger roles in governance. Processes also vary in terms of transparency, public engagement and the degree to which they involve original research. Nonetheless, there is some evidence of convergence across processes in recent years.

Third, it is worth noting that these different approaches have not produced radically different frameworks. Most of the central banks in our sample have monetary policy frameworks with similar core elements—for example, explicit inflation targets at 2 percent, often within 1 to 3 percent ranges. These frameworks have also been implemented in similar flexible and forward-looking manners, setting the path for the short-term interest rate as the primary instrument to achieve the target. “Flexible” generally refers to the fact that in choosing the path for the policy interest rate to achieve the inflation target, some attention is paid to other considerations—namely, avoiding undue fluctuations in the real economy (i.e., in output or employment) and taking into account the possible impact on financial vulnerabilities and financial stability risks.[47] This flexible inflation forecast targeting approach has been relatively successful because it helps anchor inflation expectations, thereby enhancing the credibility and effectiveness of the regime.

On the surface, therefore, it seems that the specific processes of review and renewal may not have been critical to monetary policy outcomes because the frameworks of individual central banks and their implementation have largely converged upon international best practices. This convergence is perhaps not surprising since it likely reflects a shared understanding of evolving macroeconomic theory, in general, and monetary policy, in particular, as well as lessons drawn from experience over time. The central banks in question also share a history of similar failures under previous frameworks, including, for example, the collapse of the Bretton Woods pegged exchange rate system and the ineffectiveness of targeting the growth of the money supply as a means to disinflate. They have also faced similar challenges from common large shocks and common changes in economic structures. Recent examples of the latter include lower equilibrium real interest rates and the reduced sensitivity of inflation to estimates of the output gap (i.e., the flattening of the Phillips curve).

The above-noted similarities in monetary policy frameworks across the central banks are partly reflected in realized macroeconomic outcomes. Table 1 presents some summary statistics of inflation and output volatility for Canada, New Zealand, the United Kingdom, Sweden and the United States over the 1995 to 2018 sample period. What is notable is the similarity of the

[47] Clearly, central banks that have a dual mandate are more explicit about the weight they place on the second goal.

results—no one central bank clearly dominates the others in terms of achieving macroeconomic stability.[48]

Nonetheless, some important differences across frameworks remain, especially in the implications of financial stability for the conduct of monetary policy, and more broadly, the role of the central bank in promoting financial stability. Some of these differences were made obvious by the disparate experiences of various jurisdictions during the GFC, as the severity of the crisis differed across jurisdictions. Some convergence in approaches across central banks has been driven by significant post-GFC reforms in financial regulation and supervision, especially regarding macroprudential policy. Most central banks, including those reviewed in this paper, do not use monetary policy to lean actively against the buildup of financial vulnerabilities, partly because of the existence of other more effective prudential tools. However, some inflation-targeting central banks are more aggressive in this regard. Nonetheless, all central banks are aware of the impact of monetary policy on financial vulnerabilities and the implications of financial instability for the economic outlook and monetary policy. This nexus of financial stability and monetary policy is an area of active ongoing research and policy debate. Where different central banks stand on this issue has also been influenced by their review and renewal processes.

Despite the degree of convergence in monetary policy frameworks and similarity in macroeconomic outcomes, we use Table 2 to highlight some differences in governance and other key aspects of the review and renewal processes across jurisdictions. These differences have influenced the evolution of these frameworks and can be categorized as follows:

- Governance and leadership: Who decides on the terms of a given renewal? Which institutions set the terms of reference for framework reviews?
- Regularity and timing: How are renewals and reviews scheduled? Are they state-dependent or time-dependent? Are the review or renewal processes linked, or do they run in parallel?
- Conduct and execution: Who is responsible for carrying out reviews? Do those reviews involve original research?

Of course, these are not the only important respects in which countries' review and renewal processes might differ and evolve. For example, transparency and outreach represent key determinants of the long-run legitimacy and credibility of these processes, along with areas where many countries have evolved significantly over time, especially in recent years.

[48] Beaudry and Ruge-Murcia (2017) conduct a similar comparison and obtain largely the same results, although they find inflation rates were generally closer to target in Canada.

The system of review in Canada is the best example of a regular time-dependent process, as it has been conducted every five years since 2001. BoC reviews have also been characterized by a significant and growing degree of transparency and outreach. While the Fed has, since 2012, carried out an annual renewal of its monetary policy framework, this renewal has taken place entirely within the Fed with limited external participation and visibility. To address these shortcomings, the Fed is conducting a more public process of outreach and engagement over 2019–20, although it is unclear whether this will become a regular process in the future. In both Canada and the United States, review and renewal have been led by the central bank and are more technical in nature, with a research focus.

At the other extreme, the timing of renewal in New Zealand has involved a high degree of state dependence, with PTAs often triggered by elections or changes in RBNZ leadership. Relative to the other countries in our international comparison, the renewal process in New Zealand has arguably been the most political, with parties in election campaigns often taking positions on the specific monetary policy objectives as part of their platforms. Interestingly, New Zealand is also the country in our comparison that has experienced the most frequent and material changes in its monetary policy framework, whereas in Canada and the United States (which have more technical and research-oriented processes) changes have focused more on issues of interpretation and implementation.

The Swedish experience is different from the others we reviewed in that a parliamentary committee takes the lead in establishing the timing and terms of reference for framework reviews. These reviews have been conducted on a regular basis, roughly every four to five years, and are performed by external examiners who make recommendations to the committee, with the Riksbank providing a written response.

In most of the cases examined, review processes have helped to inform renewals of the monetary policy framework. In Canada, this occurs because each review directly precedes a renewal of the BoC’s inflation-control agreement with the government. In the United Kingdom, insights from the 2013 Treasury review were incorporated into that year’s BoE remit, helping to update and clarify the monetary policy framework in time for the arrival of a new governor. In New Zealand, insights from some framework reviews have been incorporated into PTAs, while the most recent review contemplated more profound changes that were addressed through amendments to the legislation governing the RBNZ. Finally, in Sweden, the high degree of goal independence currently enjoyed by the Riksbank implies that some renewal decisions could be independently made by the Riksbank, while others required legislative changes or government action.

In summary, regular, time-dependent review and renewal processes still offer advantages relative to the other approaches described above. While more technical and central-bank-led processes also offer significant advantages, it is true that in a democracy, a rigorous and transparent process with broad engagement is consistent with good governance and enhances the political legitimacy of the framework. Moreover, this transparency is especially important as the macroeconomy and key relationships evolve and our understanding of macroeconomics improves over time.

5. Concluding remarks

Major central banks with monetary policy frameworks that target inflation have used different approaches to review, renew and evolve their frameworks over time based on shared experience and research developments. In many of these jurisdictions, the monetary policy framework consists of some form of flexible inflation-forecast targeting with an explicit numerical target of 2 percent in conjunction with a market-determined flexible exchange rate. Such frameworks have proven highly successful in anchoring inflation expectations. Consequently, most of the countries in question have experienced similar successes in achieving lower inflation and more stable macroeconomic outcomes than they had in the past.

Canada's approach to reviewing and renewing its monetary policy framework is noteworthy because it is central-bank-led, time-dependent (every five years), research-based, deliberate and transparent, and involves close coordination with the Department of Finance as the process culminates in the renewal of the joint inflation-control agreement. Generally speaking, changes to the framework have been minor and dealt primarily with implementation and communication, rather than objectives. While the process in Canada has been more technical, with limited involvement of non-specialists, it has been characterized by growing levels of outreach, with the current review leading into the 2021 renewal including steps to reach out to different groups in civil society and to members of the two houses of Parliament.

In contrast, the renewal process in New Zealand has, in practice, been largely state-dependent, with PTAs often associated with the appointment of a new governor or election of a new government. The Treasury has also tended to exert a high degree of control over the process. This has likely contributed to more political involvement and more significant and frequent changes to the framework, including the recent adoption of a dual mandate.

Recently, the Fed has begun a review process, which emulates many of the features of the Canadian process, including that it is central-bank-led, research-based and transparent. Depending on the outcome of the current process, it is likely that future reviews will be conducted on a regular basis. The ECB has also recently begun a review of its framework, with the appointment of the new ECB president. At the same time, New Zealand has recently moved to a formal system of regular five-year reviews and renewals. Based on recent remarks by Riksbank Governor Stefan Ingves, Sweden may do the same in the future.[49]

Hence, there appears to be some convergence to the Canadian approach, especially regarding time dependence, the role of the central bank, research orientation and transparency. The Canadian approach is seen as consistent with good governance principles—namely, transparency, political legitimacy and accountability. It also reflects the technical nature of the monetary policy framework and respects the operational independence of the central bank for the conduct of monetary policy.

This convergence is expected to continue and will likely broaden to a wider set of jurisdictions with similar monetary policy frameworks. The need for more formal review and renewal has increased, with several ongoing challenges facing monetary policy: slower productivity and potential growth in many countries, lower global equilibrium real interest rates, and higher levels of public and private debt. These challenges have sparked active research and serious reconsideration regarding key aspects of inflation-targeting monetary policy frameworks, including their objectives, tools, communication strategies and optimal mix with fiscal and macroprudential policies. The speed and extent of convergence in countries' review and renewal practices will, however, be influenced by the institutional structures governing their central banks, in particular the roles of the government, treasury and legislative bodies.

Increasing threats to independence represent another important challenge to central banks. Clearly, having well-governed review and renewal processes for their monetary policy frameworks, with sufficient transparency and engagement, will help central banks counter such threats. Moreover, to the extent that such processes increase the political legitimacy of the underlying monetary policy frameworks while maintaining central banks' necessary operational independence, they will importantly contribute to monetary policy credibility and better enable policy-makers to achieve low and stable inflation and strong and sustainable employment and output growth.

[49] Ingves (2019) argues that regular reviews and renewals would increase the political legitimacy of Riksbank monetary policy.

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Table 1: Summary statistics for inflation and output
Sample: 1995Q1 to 2018Q3

	Annual CPI inflation		Standard deviations			
	Average	Standard deviation	HP (1600) GDP gap	HP (6400) GDP gap	Q/Q GDP growth rate	Annual GDP growth rate
Canada	1.8	0.8	1.1	1.3	0.6	1.8
New Zealand	2.0	1.2	1.0	1.4	0.9	1.8
United Kingdom	1.9	0.9	1.1	1.4	0.6	1.9
Sweden	1.1	1.2	1.6	1.8	0.9	2.5
United States	2.2	1.1	1.1	1.3	0.6	1.8

Table 2: Comparison of review and renewal processes in five advanced jurisdictions

		Bank of Canada	Reserve Bank of New Zealand		Bank of England*	Riksbank	Federal Reserve
			PTA system	Remit system			
Governance and leadership	Who decides on the terms of a given renewal?	BoC and Department of Finance	RBNZ Governor and Minister of Finance	Minister of Finance	Chancellor of the Exchequer	Riksbank Executive Board†	Federal Open Market Committee
	Who sets the terms of reference for reviews?	BoC	Parliament or government	RBNZ	Treasury	Finance Committee of the Swedish parliament	Federal Reserve
Timing and regularity	Timing of renewals	Time-dependent (every five years)	State-dependent (often linked with elections and changes in RBNZ leadership) ‡	Time-dependent (every five years)	Time-dependent (every year)	Ad-hoc	Time-dependent (every year)
	Timing of reviews	Time-dependent (every five years, in advance of renewals)	Ad-hoc	Time-dependent (every five years, in advance of renewals)	Ad-hoc	Time-dependent (generally every four to five years)	Ad-hoc
Conduct and execution	Who is responsible for carrying out reviews?	BoC	Parliament or outside experts	RBNZ	Treasury	Outside experts	Federal Reserve
	Do reviews involve original research?	Yes	No	Yes	No	No	Yes

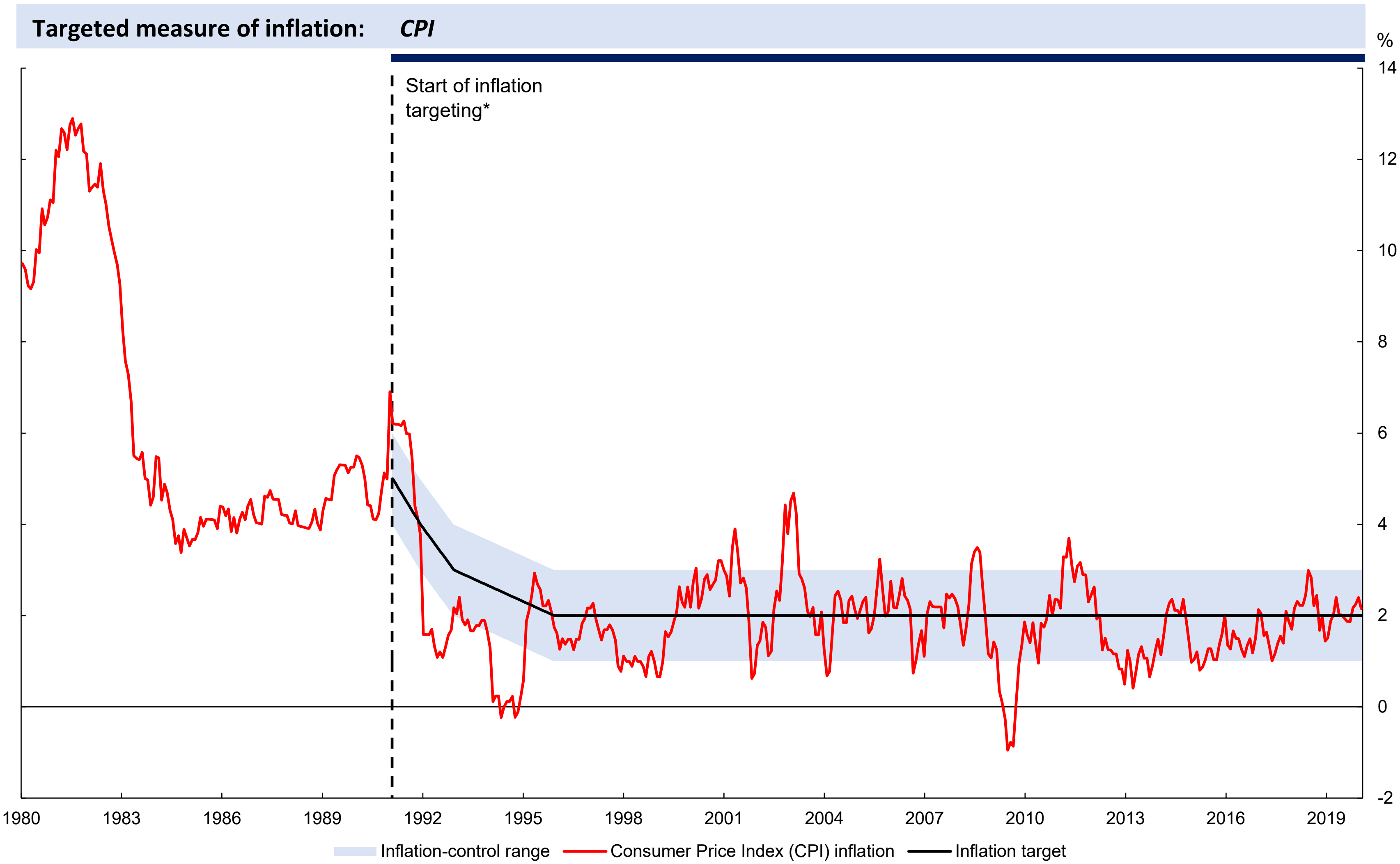
* When categorizing the review process of the BoE, we focus on the 2013 Treasury review since it represents the most significant and comprehensive framework review to date, along with the only example of a framework review formally linked with a remit letter. As mentioned in the main text, the UK parliament has also touched on framework issues in various reports on monetary policy, especially in the first decade or so following BoE independence.

† As noted in the main text, the Riksbank Executive Board can independently implement framework changes regarding the interpretation and operationalization of its price stability mandate, but broader changes require action from the government or legislature.

‡ As explained in the main text, PTAs would generally inherit the RBNZ Governor's own five-year fixed term absent renegotiation or an early change in Governor, but "off-cycle" PTAs were relatively frequent, especially following changes in government.

Chart 1: History of inflation targeting in Canada

Monthly observations, year-to-year percentage changes



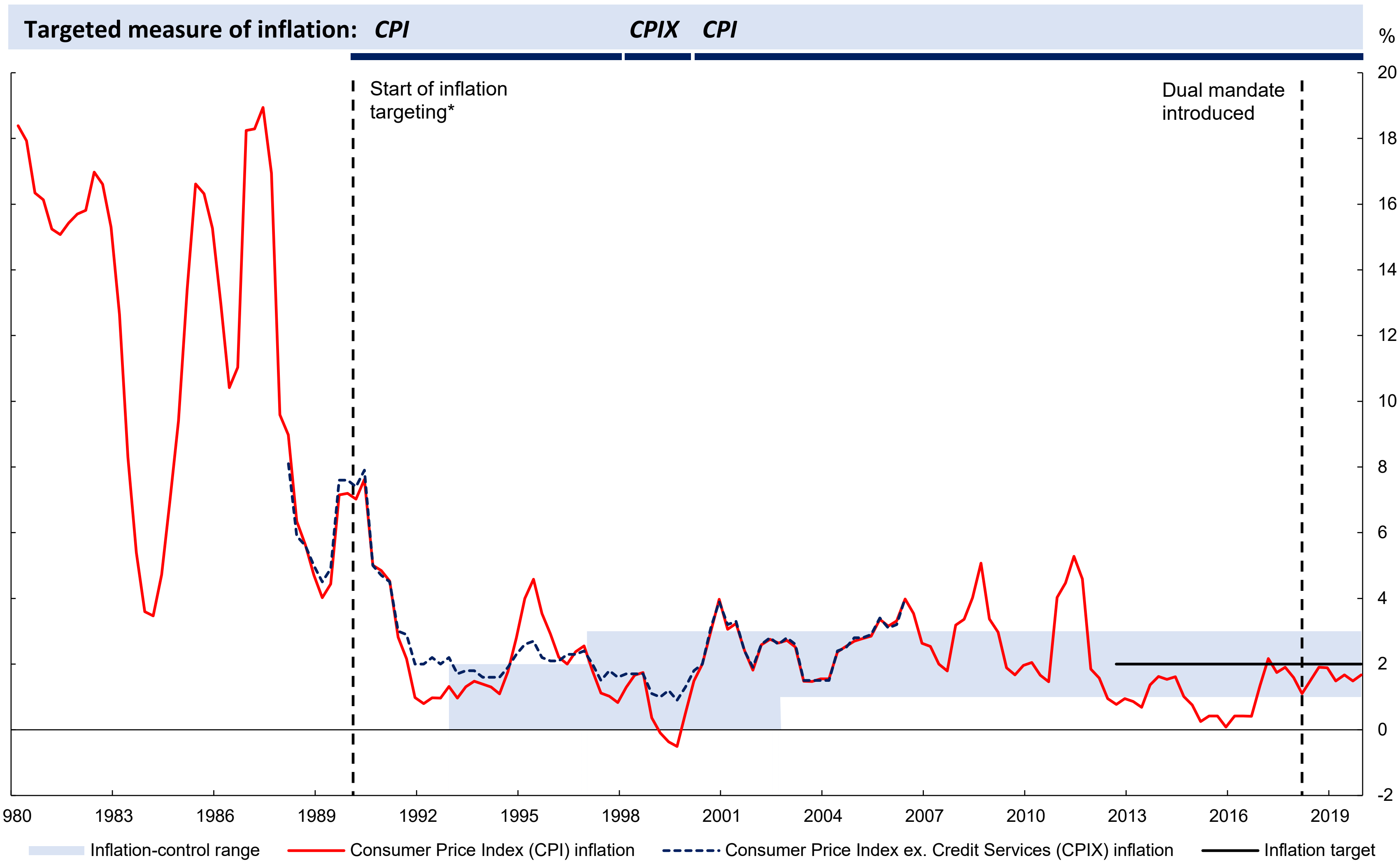
*The first target was adopted in February 1991 but was specified in terms of the rate of year-over-year increase in CPI at the end of 1992.

Sources: Statistics Canada and Bank of Canada

Last observation: February 2020

Chart 2: History of inflation targeting in New Zealand

Quarterly observations, year-to-year percentage changes

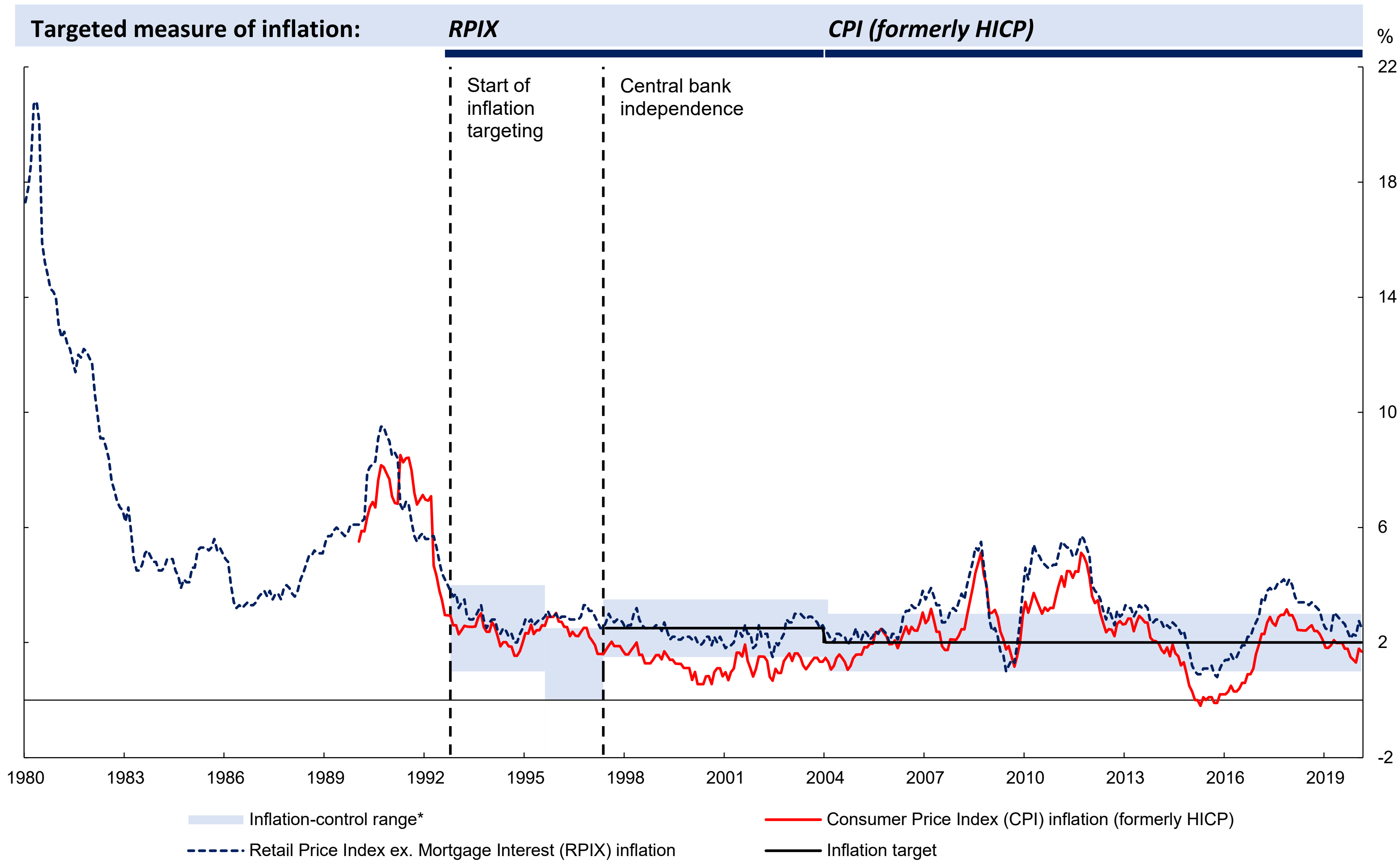


*The first target was adopted in February 1990 but was specified in terms of the rate of year-over-year increase in CPI at the end of 1992.

Sources: Statistics New Zealand and Reserve Bank of New Zealand

Last observation: December 2019

Chart 3: History of inflation targeting in the United Kingdom
Monthly observations, year-to-year percentage changes

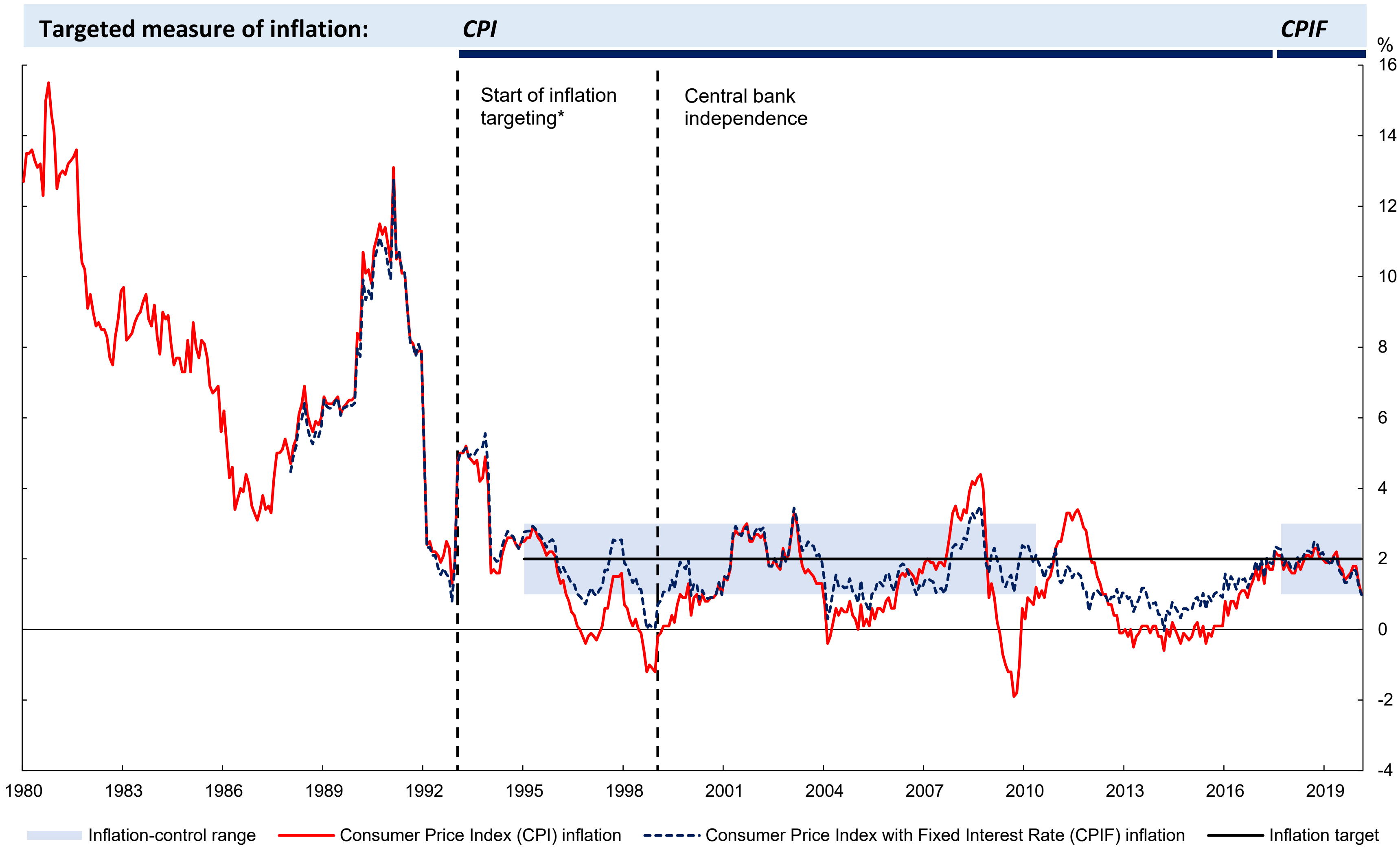


*For 1997 on, the inflation-control range reflects the thresholds past which the Bank of England governor is required to send an explanatory letter to the Chancellor.
Sources: United Kingdom Office for National Statistics and Bank of England

Last observation: February 2020

Chart 4: History of inflation targeting in Sweden

Monthly observations, year-to-year percentage changes



*The Riksbank formally adopted an inflation-control target in January 1993, when it announced an initial target of 2 percent for the rate of year-over-year increase in CPI beginning in 1995.

Sources: Statistics Sweden and Sveriges Riksbank

Last observation: February 2020

Chart 5: History of inflation targeting in the United States
Monthly observations, year-to-year percentage changes

Source: Federal Reserve Economic Data

Last observation: February 2020