

Monetary Policy Frameworks: Recent International Developments

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- Central banks in advanced economies have faced significant challenges in recent years, with prolonged low inflation occurring against a background of rising financial stability concerns in some economies.
- While few advanced economies have made significant changes to their inflation-targeting frameworks since 2012, the tools that central banks have employed to meet their inflation targets have evolved.
- In particular, several central banks have announced or expanded asset purchase programs, moved policy rates below zero or taken on greater roles in contributing to financial stability.
- Some central banks have modified their set of preferred core inflation measures and continue to make use of them to monitor underlying trends in total inflation.

In 2016, the federal government and the Bank of Canada will renew their inflation-control target agreement for a further five years. In support of the renewal process in the past, the Bank has reviewed inflation-targeting (IT) frameworks in other countries (e.g., Paulin 2006; Lavigne, Mendes and Sarker 2012). This article provides an overview of developments in IT frameworks in 10 advanced economies since the previous renewal, which took place in 2011.¹ In particular, it highlights developments related to the three areas of research the Bank is focusing on during its review:

- the level of the inflation target,
- the measurement of core inflation and
- financial stability considerations in the formulation of monetary policy.

In the Spring 2012 issue of the *Bank of Canada Review*, Lavigne, Mendes and Sarker (henceforth Spring 2012 Review article) noted that monetary policy frameworks had faced significant challenges, particularly following the 2007–09 global financial crisis. These challenges have continued to evolve: considerable excess supply persists in several economies and, following the plummet in oil prices that began in 2014, total rates of inflation declined substantially in some economies. In some cases, this has

¹ The central banks reviewed here are the Reserve Bank of Australia, the Bank of Canada, the European Central Bank, the Bank of Japan, the Reserve Bank of New Zealand, Norges Bank, the Swedish Riksbank, the Swiss National Bank, the Bank of England and the US Federal Reserve.

compounded existing and prolonged low underlying inflation. Against this background, in some economies there have also been ongoing concerns about financial stability in an era of low interest rates.

The appropriate response of central banks to such challenges has been the topic of debate. For example, in light of concerns about persistently low inflation, there have been some calls for central banks to increase inflation targets (Blanchard, Dell’Ariccia and Mauro 2010; Ball 2014), while others have raised concerns that doing so would risk central bank credibility and consequently make it harder to stabilize inflation around a higher target (e.g., Mishkin 2011). There is also ongoing debate over the appropriate degree to which monetary policy should account for financial stability concerns, from those who argue that monetary policy should remain focused on price stability (e.g., Svensson 2014) to those who call for monetary policy to play a greater role in accounting for financial cycles (e.g., Stein 2013 and Borio 2014).

In practice, central banks have responded to these challenges in many different ways, depending on their circumstances: announcing or enhancing asset purchase programs; breaking through the zero lower bound on interest rates as central bank deposit and policy rates moved below zero in some economies; and more explicitly addressing financial stability concerns in the conduct of monetary policy. Exploratory analysis suggests little change in the basket of core inflation measures used at most central banks. In some instances, however, there has been a slight shift in emphasis from a preferred “focal” measure of core inflation to a broader set of alternative measures of underlying trends in inflation.

◀ *Central banks have responded to evolving challenges in many different ways, depending on their circumstances*

Inflation-Targeting Frameworks During a Period of Prolonged Low Inflation

There have been few changes to either the numerical inflation target or the target variable in advanced economies since the Spring 2012 Review article (Table 1). All of these targets are defined in terms of total consumer price inflation, ranging from around 2.0 to 2.5 per cent, although some central banks frequently reference a measure of consumer price inflation that excludes certain volatile components when they communicate their monetary policy analysis (e.g., the Riksbank, Bank of Japan and, to a lesser extent, the Bank of Canada and Norges Bank).

Only Japan has changed the level of its inflation target since the Spring 2012 Review article, raising its target from 1 to 2 per cent in January 2013, which brought it in line with the targets in most advanced economies. When introducing the change, the Bank of Japan cited the need to anchor a sustainable rate of inflation and argued that the inflation rate consistent with price stability on a sustainable basis would rise following efforts to strengthen competitiveness and growth potential. The other main change has been the Reserve Bank of New Zealand (RBNZ)’s new focus on keeping future average inflation near the 2 per cent midpoint of its 1 to 3 per cent inflation-target range, introduced in its *Policy Targets Agreement for 2012* with the government.² Subsequent RBNZ commentary has suggested that this explicit focus on the midpoint helps to anchor expectations near 2 per cent, making the outlook more resilient to

² The previous *Policy Targets Agreement for 2008* had indicated that the RBNZ would target inflation outcomes between 1 per cent and 3 per cent on average, without specifying a focus on the midpoint. The range and level of the RBNZ’s inflation-target band has changed several times in the past with the signing of new policy target agreements.

Table 1: Monetary policy frameworks in selected advanced economies

Central bank	Date inflation targeting adopted	Current inflation target	Target variable	Changes since Spring 2012 Review article (May 2012)
Reserve Bank of New Zealand	March 1990	2 per cent midpoint (since 2012) in 1–3 per cent range (since 2002; several previous adjustments)	Consumer price index (CPI)	Inflation target focuses on the 2 per cent midpoint (since September 2012)
Bank of Canada	February 1991	2 per cent midpoint in 1–3 per cent range (since end of 1995, following a transition period from 1991)	CPI (operationally use core CPI)	No significant changes
Bank of England	October 1992	2 per cent (since 2004, following previous adjustments) (±1 percentage point, but not a target range)	CPI	No significant changes
Swedish Riksbank	January 1993	2 per cent (since 1995, following a transition period) (±1 percentage point tolerance interval removed in 2010)	CPI (emphasis on underlying measures of inflation)	No significant changes
Reserve Bank of Australia	March 1993	2–3 per cent, on average, over the business cycle (since initial adoption in 1993 and formal endorsement in 1996)	CPI	No significant changes
European Central Bank ^a	January 1999	Below, but close to, 2 per cent (since initial announcement in 1999 and confirmation in 2003)	Harmonised Index of Consumer Prices (HICP)	No significant changes
Swiss National Bank ^a	January 2000	Less than 2 per cent (since 2000)	CPI	No significant changes
Norges Bank	March 2001	Approximately 2.5 per cent (since 2001) (±1 percentage point, but not a target range)	CPI (emphasis on a core measure of the CPI)	No significant changes
US Federal Reserve ^b	January 2012	2 per cent (since January 2012)	Personal consumption expenditure price index (PCEPI)	No significant changes
Bank of Japan	February 2012	2 per cent target (since January 2013)	CPI (emphasis on a measure of CPI that excludes fresh food)	Target introduced January 2013; previously 1 per cent goal since February 2012; previously undefined but generally interpreted to be 0 per cent

a. The European Central Bank and the Swiss National Bank do not consider inflation targeting the goal of their monetary policy regimes.

b. The Federal Reserve does not use the word “target” to describe its inflation objective. Rather, it has stated that 2 per cent inflation is “most consistent over the longer run with the Federal Reserve’s mandate for price stability and maximum employment.”

Sources: Lavigne, Mendes and Sarker (2012); central bank websites

temporary deviations of inflation from the target band and helping to avoid inflation expectations becoming biased at either end of the target range (Ford, Kendall and Richardson 2015).³

Evolution of the monetary policy toolbox since 2012

Although inflation targets have remained more or less unchanged, central banks have introduced many different and innovative policy measures to implement their IT frameworks, such as asset purchase programs (also known as quantitative easing), negative interest rates, forward guidance and exchange rate policies.⁴ These new tools were introduced in the context of inflation well below target in many advanced economies and with deviations from target that have increased since 2012 (Chart 1).

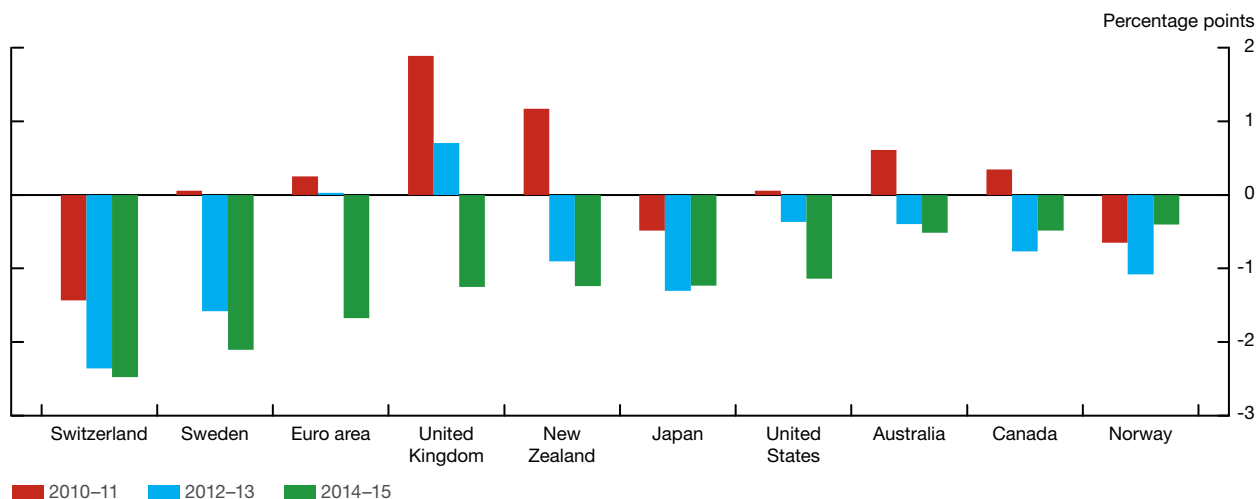
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³ RBNZ analysis finds that long-run inflation expectations have indeed shifted lower toward the 2 per cent midpoint since the increased focus on the midpoint of the target range was introduced in 2012 (Lewis 2016).

⁴ Since 2012, the Bank of England, the Bank of Japan and the European Central Bank have also launched targeted loan programs to help ease credit conditions and assist in improving the monetary policy transmission mechanism.

Chart 1: Deviation of total inflation from target in advanced economies

Average of monthly data



Note: Deviation of total inflation is calculated based on personal consumption expenditures inflation for the United States, Harmonised Index of Consumer Prices inflation for the euro area and CPI inflation for all other countries. A time-varying inflation target is used in the calculations for Japan (i.e., a 2 per cent target since January 2013, a 1 per cent target from February to December 2012, and a 0 per cent target before February 2012).

Sources: National sources via Haver Analytics

Last observation: December 2015

Faced with both the zero lower bound and prolonged low inflation, the European Central Bank (ECB), the Bank of Japan and the Swedish Riksbank introduced asset purchase programs, while the Bank of England expanded its asset purchase program (Table 2). How central banks approach asset purchase programs differs along a number of dimensions, including their size and whether other measures are implemented (e.g., negative policy rates). In all of these cases, however, achieving the inflation target in the current economic context was cited as a key reason for introducing the asset purchase programs. An analysis of the effectiveness and potential limitations of such programs is provided separately in this issue (Santor and Suchanek 2016).

The Federal Reserve introduced aggressive large-scale asset purchases earlier than many other central banks. Partly reflecting this action, inflation expectations and labour market conditions recovered more quickly than they did in many other advanced economies. The Federal Reserve was in a position to begin tapering off asset purchases beginning in December 2013, at a time when other central banks were still expanding such programs. The final asset purchase was conducted by the Federal Reserve in October 2014.

Negative interest rates, another type of unconventional monetary policy, have been introduced by many central banks since mid-2014.⁵ This includes negative deposit rates charged by the central banks of Switzerland, Sweden, the euro area and Japan as well as negative targets for the key policy rate in Sweden and Switzerland.⁶ As discussed in Jackson (2015), the reasons for implementing negative interest rates have varied across central

⁵ This was not the first time that negative policy interest rates had been used. The Riksbank's deposit rate was negative from July 2009 to September 2010, for example, and Danmarks Nationalbank's deposit rate was negative from July 2012 to April 2014.

⁶ The Danish central bank, Danmarks Nationalbank, also introduced a negative deposit rate in September 2014. In this article, because we focus on inflation-targeting central banks, we do not include Danmarks Nationalbank in our main review.

Table 2: Key changes to asset purchase programs since the Spring 2012 Review article

Central bank	Date implemented	Change to asset purchase program (APP)	Motivation ^a
Bank of England	July 2012	Increased the size of the APP	To balance the risks to inflation around the 2 per cent target in the medium term
Bank of Japan	April 2013	Quantitative and qualitative monetary easing program launched (the pace and average maturity of asset purchases have since been increased)	To achieve and maintain the price stability target
US Federal Reserve	December 2013–October 2014	Gradual reduction of APP	To make progress toward maximum employment, ongoing improvement in labour market conditions and inflation moving back closer to its longer-run objective
European Central Bank	October 2014	Initiated APP	To underpin the firm anchoring of medium- to long-term inflation expectations
	March 2015, March 2016	Expanded APP List of eligible assets expanded to include public sector assets (March 2015) and investment-grade euro-denominated bonds issued by non-bank corporations established in the euro area (March 2016)	To promote a sustained adjustment in the path of inflation that is consistent with the inflation target To contribute to an easing of financial conditions of the real economy
Swedish Riksbank	February 2015	Introduced APP (the size of the program has since been expanded gradually)	To safeguard the role of the inflation target as a nominal anchor for price setting and wage formation

a. "Motivation" summarizes the objective provided by central banks in their press statements when their unconventional monetary policy measures were announced. Sources: Central bank press releases and websites

banks. In many cases, however, central banks cited the need to increase inflation and achieve their inflation targets. An analysis of the economics and practicalities of negative interest rates is provided separately in this issue (Witmer and Yang 2016).

Forward guidance, in which central banks provide explicit statements about the future path of interest rates, is another policy tool that has been used to provide additional monetary stimulus. Different types and durations of forward guidance have been implemented since 2012, including by the central banks of the United States, the euro area, Japan, the United Kingdom and Sweden.⁷ In reviewing this international experience, Charbonneau and Rennison (2015) find that forward guidance can be an effective tool when clearly communicated and perceived as credible, although these benefits need to be weighed against the associated costs.

Some central banks have also made changes to their exchange rate policies. The Swiss National Bank (SNB), for example, introduced a minimum exchange rate in 2011 in response to the threat of deflation resulting from an overvaluation of the Swiss franc. In January 2015, the SNB discontinued its exchange rate floor after it was assessed to be unsustainable, given the weakening of the euro. The SNB indicated that it will continue to consider the exchange rate when formulating its monetary policy.⁸ In January 2016, the Executive Board of the Swedish Riksbank assumed the ability to instantly intervene in foreign exchange markets as necessary to complement other monetary policy measures supporting inflation.

⁷ Some of these central banks had also used forward guidance before 2012, in addition to the Bank of Canada, which had provided forward guidance from April 2009 to April 2010.

⁸ Since November 2013, the Czech National Bank has also maintained an exchange rate floor of 27 CZK/EUR as an additional monetary policy tool. The stated intention of weakening the exchange rate was to attain the inflation target and avert the threat of deflation rather than concern over exchange rate volatility.

Measuring and Communicating Core Inflation

There will always be sharp movements in total CPI, driven by volatile price changes in a small number of goods and services. As a result, many central banks often use measures of core inflation that reflect underlying price pressures (or “underlying inflation”) as an operational guide for monetary policy. The most commonly used measures are those that exclude items with the most volatile price movements, which in many cases include energy and food products, from the CPI (Table 3). The use of such measures has become particularly relevant in assessing and explaining shocks to total inflation in recent years in light of large movements in energy prices and exchange rates.

Few substantial changes have been made to the basket of core measures used at most central banks since 2012. Some central banks (e.g., Canada, the United Kingdom, the euro area and Japan) have shifted their emphasis slightly, however, from a focal measure to a set of measures, while the reverse is true for other central banks (e.g., Norway and Australia). In many cases, central banks do not explicitly announce or explain these changes, and it is unclear whether the shifts are intended to be permanent. Table 3 therefore focuses on central banks’ observed selection of core inflation measures, rather than assessing possible reasons for the use of particular measures.

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Table 3: Core inflation measures at selected central banks in advanced economies

Central bank	Types of measures (focal measures underlined) ^a	Changes since Spring 2012 Review article
Reserve Bank of New Zealand	Model-based measure (sectoral factor model), trimmed mean, weighted median	The sectoral factor model was modified in 2013. A recurring graph of alternative measures in its <i>Monetary Policy Statement</i> was dropped at the end of 2014.
Bank of Canada	Exclusion-based CPIX (CPI excluding eight of the most volatile components), trimmed mean, volatility-weighted, weighted mean, factor model	Since April 2012, many monetary policy reports (MPRs) have featured a chart comparing alternative core inflation measures, which have featured a common component measure since late 2013. More general references to “underlying inflation” increased over 2014 until around mid-2015.
Bank of England	Exclusion-based	Core inflation has been increasingly noted in inflation reports (IRs) and monetary policy minutes since mid-2014. The August 2015 IR reported a broader set of measures, but these are not yet a regular feature of communications.
Swedish Riksbank	Exclusion-based CPIF (CPI with fixed mortgage interest rates), trimmed mean, volatility-weighted	“CPIF excluding energy” has been increasingly emphasized since early 2015. The term “underlying inflation” (referring to the lasting inflation rate or inflation trend) has been increasingly used since 2014.
Reserve Bank of Australia	Trimmed mean, exclusion-based, weighted median	The general concept of underlying inflation or a range of measures is typically referenced. The trimmed mean has received some additional emphasis in statements on monetary policy since mid-2013.
European Central Bank	Exclusion-based HICPX (HICP excluding food and energy) is often used to gauge underlying developments in inflation	The December 2013 <i>Monthly Bulletin</i> assessed subindexes of the HICP, stating that they provided information on “underlying dynamics of headline inflation developments” but were not official measures of core or underlying inflation. The July 2015 <i>Economic Bulletin</i> reported a broader set of measures in a discussion of underlying inflation, but these are not yet a regular feature of communications.
Swiss National Bank	Exclusion-based, trimmed mean	Somewhat less discussion of individual core inflation measures since 2012.
Norges Bank	Exclusion-based CPI-ATE (CPI adjusted for tax changes and excluding energy products), trimmed mean, weighted median	MPRs have emphasized CPI-ATE slightly more than alternative measures, particularly since around mid-2013.
US Federal Reserve	Exclusion-based “Core PCEPI,” trimmed mean, weighted median, factor model	No major changes observed since 2012. Monetary policy reports to Congress occasionally mention core inflation measure in addition to core PCEPI (e.g., core CPI, trimmed mean), but these are not a regular feature of the reports.
Bank of Japan	Exclusion-based (CPI, all items less fresh food), trimmed mean	Alternative measures have received additional emphasis in the past year, including a new weighted median (<i>Outlook Report</i> , October 2015; not yet clear if this will be a regular feature of communications).

a. Based on an assessment by Khan, Morel and Sabourin (2015) of core inflation measures most commonly reported in central bank communications.

The relative emphasis given to focal measures varies across central banks.

Sources: Khan, Morel and Sabourin (2015); central bank websites

One method to gauge the shift in emphasis is to analyze the incidence of terms related to core inflation that central banks use (**Box 1**). This approach is common in social media analysis and is sometimes referred to as “keyword density analysis.” This type of analysis is a subset of broader textual analysis that is increasingly being applied in the economic and financial literature. While our application of this textual analysis is both simple and exploratory, it suggests a number of findings:⁹

- (i) Word counts of specific terms used in the monetary policy reports (MPRs) of individual central banks suggest that considerable differences have persisted in the frequency of core inflation terms, the relative emphasis given to a focal measure of core inflation and how this has changed over time (**Chart 2**). In general, core inflation appears to be discussed at a relatively high frequency in the MPRs of small open economies (e.g., Canada, Sweden, Norway and, to a lesser extent, Australia and New Zealand) as well as, particularly recently, Japan. This may relate to the exposure of small open economies to foreign shocks, including those that affect headline inflation. Exploring this link further could be an area for future analysis.
- (ii) In several cases, prominent spikes in the data reported in **Chart 2** can be attributed to explanatory boxes in MPRs. These boxes cover a variety of topics related to core inflation, including the effect of exchange rate pass-through (e.g., Bank of Canada in July 2015), energy prices (e.g., ECB in July 2015, which mentioned oil price movements among

⁹ The terms used to refer to core inflation vary across central banks. Unless otherwise noted, we use the term “core inflation” to refer to related concepts, including underlying inflation and specific measures of core inflation used by different central banks.

Box 1

Analyzing Communications on Core Inflation: Methodology

We conduct a simple version of the text-search approach by calculating the frequency with which terms related to core inflation appear in the monetary policy reports (MPRs) published by central banks.^{1,2} We focus on MPRs because they provide analytic detail of economic conditions. These communications would therefore be expected to reflect changes in a central bank’s calculations of, and discussions about, core inflation over time. We selected a set of search terms related to core inflation that refer to the focal

measure used at each central bank.³ We erred on the side of being more conservative in our definition of a focal measure when it was unclear whether a central bank was referring to its focal measure in particular or core inflation in general. See **Chart 2** for the results of this exercise.

This approach has limitations. The text search does not identify indirect references to the concept of core inflation. The trade-off in expanding the set of search terms is to introduce a greater element of judgment in assessing what should be considered a relevant reference to core inflation. In addition, the text search does not distinguish between domestic and foreign developments in core inflation, both of which are included in MPRs published by several central banks. Furthermore, it does not fully capture the context of the core inflation terms and therefore does not reflect more nuanced changes in how core inflation is discussed in monetary policy communications over time.

¹ Several studies have assessed the topics covered by central bank communications, using a range of statistical approaches. For example, some use the “latent semantic analysis” technique to identify common themes across texts (e.g., Hendry and Madeley 2010; Boukus and Rosenberg 2006), while others include a simple word count of terms of interest (e.g., Peek, Rosengren and Tootell 2015; Berger, de Haan and Sturm 2011).

² Our search removed punctuation and capitalization from the texts and identified the following terms and stems: underlying inflation, core inflation, core CPI, core PCE, factor model, trimmed mean, weighted median, CPI EX, CPI ATE, CPI AT, CPI AE, CPIM, CPI FW, CPI F, und24, trim85, tm15, sfs01, sfs02, CPI X, CPI XFET, CPI W, meanstd, common component, component weights in CPI, sticky CPI components, diffusion index, HICP inflation ex, HICP ex, HICPX, CPI less, less fresh food, less food and energy, excluding food and energy, median CPI, underlying price, underlying trend in prices, underlying trend in inflation, underlying trend of inflation.

³ We used the following search terms for each central bank’s focal measure: RBA (trimmed mean), Bank of Canada (CPIX, core CPI), ECB (HICPX, HICP ex, HICP inflation ex), Bank of Japan (less fresh food, core CPI), RBNZ (factor model), Norges Bank (CPI ATE), Riksbank (CPI F), SNB (core inflation rate 1, SFSO1, trimmed mean, TM15), Bank of England (core CPI), US Federal Reserve (core PCE, core personal, excluding food and energy).

several drivers of underlying inflation developments) and excess supply (e.g., Bank of Canada in April 2014), and comparing alternative measures of core inflation (e.g., ECB in December 2013, Bank of Japan in October 2015). Note, however, that in some case these topics are discussed in central banks' MPRs even when they are not observable as spikes in the data.

- (iii) The frequency with which terms related to core inflation appear in monetary policy communications seems to have been relatively constant at most central banks since 2012, despite the experience with prolonged low inflation and various commodity price shocks in many advanced economies during this period (Chart 2). One exception is Norges Bank, where discussion of core inflation measures other than its focal measure, CPI-ATE (CPI adjusted for tax changes and excluding energy products), has gradually decreased since 2012.¹⁰ Another exception is the Bank of Japan, which discussed both its focal measure and other measures of core inflation more frequently over 2015. This was partly driven by increased discussion of core inflation excluding energy prices, which was higher than headline inflation because of the impact of declining energy prices.¹¹ Other central banks have increased the frequency with which they refer to “underlying inflation” in addition to, or instead of, a specific measure (e.g., Riksbank in 2014 and the Bank of Canada from 2014 to around mid-2015).¹²
- (iv) In cases where the focal measure includes energy prices (the Riksbank, Bank of Japan), versions of the measures that exclude energy have been increasingly discussed in monetary policy communications over the past year. In view of the large changes in energy prices over the past two years, such core measures can be helpful in distinguishing between the impact of a temporary relative price shock (such as the commodity price shock) and a more fundamental shock to the underlying inflationary pressures.

Financial Stability Considerations

All central banks contribute to the stability of the financial system to some extent through vulnerability assessments and risk analysis as well as crisis resolution, in their role as lender of last resort, for example. Five of the ten central banks reviewed here also have an explicit financial stability objective in their legal mandate.

The majority of the 10 central banks publish a financial stability report (FSR), or equivalent document, in which they review and analyze developments in and risks to the financial system. The only exception is in the United States, where an FSR-type document has been published as an annual report of the Financial Stability Oversight Council (of which the US Federal Reserve is a member) since 2011.

◀ *All central banks contribute to the stability of the financial system to some extent, and five of the ten central banks reviewed here also have an explicit financial stability objective in their legal mandate*

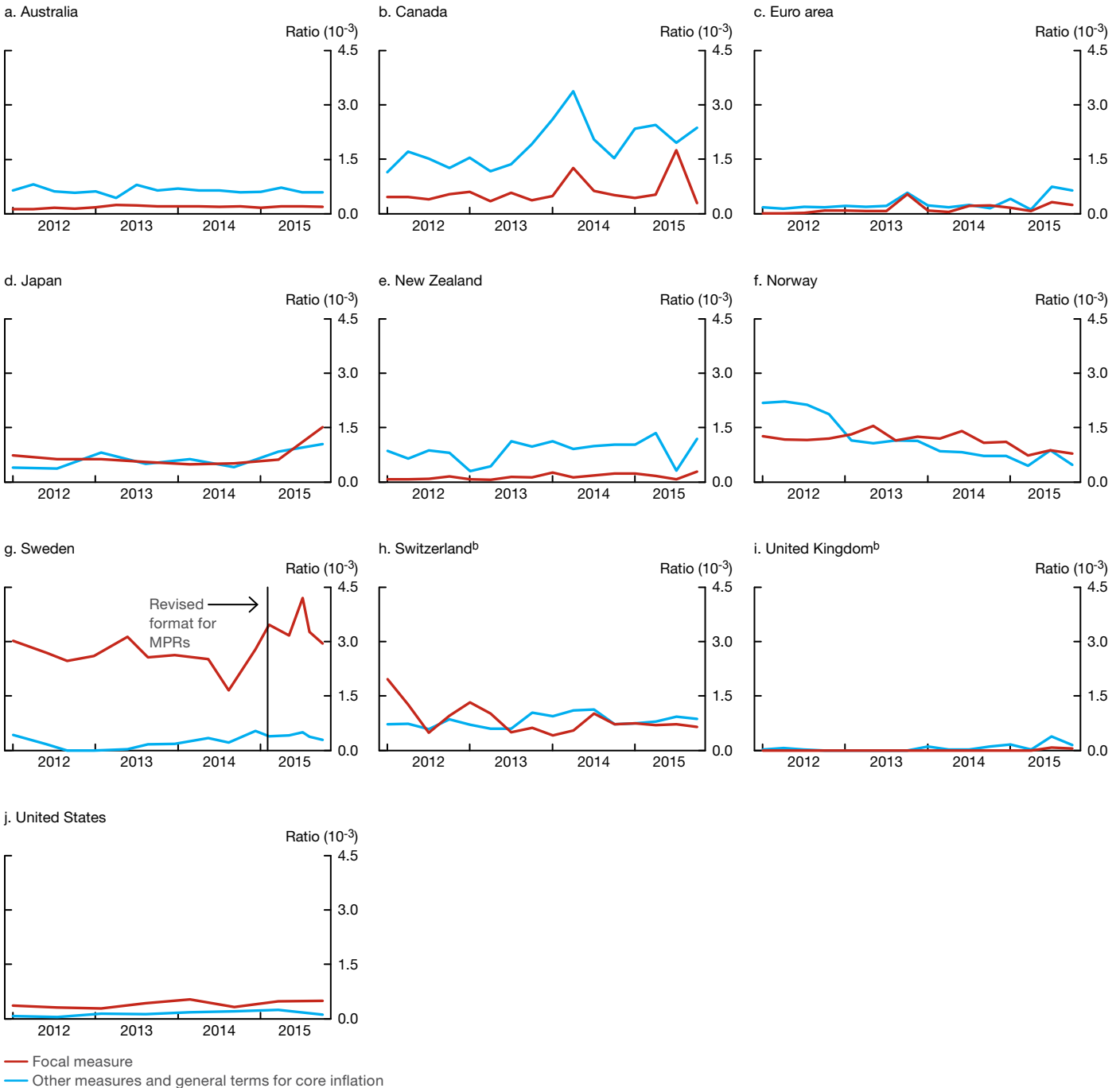
¹⁰ The main alternative to CPI-ATE is CPIXE (CPI adjusted for tax changes and excluding temporary changes in energy prices). CPIXE was introduced in 2008, in response to CPI-ATE's underestimation of overall inflation as a result of the persistent trend of rising energy prices (Nordbø 2008). The shift in emphasis from CPIXE to CPI-ATE in mid-2013 coincided with methodological revisions to reduce the volatility of CPIXE calculations, but it is unclear to what extent these developments are related.

¹¹ The Bank of Japan's core inflation word count also rose in 2015 due to an Outlook Report box discussing developments in underlying inflation.

¹² In the case of the Bank of Canada, the term “underlying inflation” has been used in the discussion of the transitory effects of exchange rate depreciation and some sector-specific factors, which could influence measures of core inflation.

Chart 2: Core inflation terms in central bank monetary policy reports, ^a 2012–15

Ratio of core inflation terms relative to total word count; focal measure and frequency vary by central bank



a. Monetary policy reports have been shortened to exclude front- and back-end material, special articles, statistical reports, etc.

b. For central banks that do not define a focal measure, we searched for commonly used terms. See footnotes 2 and 3 in Box 1 for a list of search terms for all central banks.

Note: See Box 1 for more detail on the methodology used to calculate the frequency of core inflation terms.

Sources: Bank of Canada analysis of monetary policy reports published by central banks: RBA (*Statement on Monetary Policy*), Bank of Canada (*Monetary Policy Report*), ECB (the March, June, September and December releases of the *Monthly Bulletin* 2012–14 and *Economic Bulletin* 2015), Bank of Japan (*Outlook Report*), RBNZ (*Monetary Policy Statement*), Norges Bank (*Monetary Policy Report*), Riksbank (*Monetary Policy Report*; we do not include *Monetary Policy Updates* because the word counts are not comparable to the longer reports), SNB (*Quarterly Bulletin*), Bank of England (*Inflation Report*) and US Federal Reserve (*Monetary Policy Report to Congress*).

Last observation: December 2015

In addition, several central banks contribute to financial stability through their involvement in micro- and macroprudential policy. This includes some central banks that have assumed primary responsibility for macroprudential policy (e.g., the Bank of England and the RBNZ in 2013), and others that have been assigned specific roles in contributing to financial stability in cases where responsibility for macroprudential policy is shared across multiple institutions (e.g., Norges Bank was assigned responsibility for issuing advice on the countercyclical capital buffer level in 2013, and the ECB assumed responsibility for the supervision of large euro-area banks when the Single Supervisory Mechanism came into force in November 2014).

Incorporating financial stability considerations into monetary policy decisions

Central banks may also use monetary policy itself to respond to financial stability concerns—that is, setting policy rates to take into account the buildup of financial imbalances. Work by the Bank for International Settlements supports this approach on the basis that monetary policy frameworks should take financial cycles into account more systematically, given the impact of monetary policy on financial stability (e.g., Borio 2014). The Spring 2012 Review article provided an overview of central banks that had made provisions for financial stability considerations in the conduct of monetary policy, and we highlight some examples of subsequent developments below.

In practice, Norges Bank presented one of the most explicit frameworks for incorporating financial stability considerations into monetary policy in its March 2012 *Monetary Policy Report*, when it published adjusted criteria for an appropriate interest rate path and a corresponding adjusted loss function to account for the potential contribution of low interest rates to the buildup of financial imbalances. The Bank of England also explicitly linked its conduct of monetary policy with financial stability for a finite period.¹³ Its August 2013 Monetary Policy Committee (MPC) statement included three “knockout” conditions, one of which was that the policy rate could have been raised if the monetary policy stance was deemed to pose a significant threat to financial stability that could not be contained by regulatory actions.

Other central banks have monetary policy frameworks that account for financial stability considerations to varying degrees and have described this relationship through speeches and other monetary policy communications. The Bank of Japan, for example, has explained that its monetary policy is conducted within a framework in which it examines risk factors related to financial imbalances, among other factors, and macroeconomic developments (Sato 2014). At the Bank of Canada, monetary policy is conducted using a risk-management framework in which different sets of risks—including those related to financial stability—are balanced against risks to price stability. When the flexibility in returning inflation to target within a reasonable time frame permits, monetary policy tactics can be chosen to mitigate any potential adverse effects on financial stability (Poloz 2014).

Press releases accompanying monetary policy decisions have also been used to note instances where financial stability concerns were considered in the monetary policy decision. Since late 2012, for example, the Bank of Canada’s monetary policy press releases regularly noted household imbalances and other risks to financial stability among other economic

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¹³ In subsequent periods, the Bank of England has also outlined ways in which coordinated use of its policy tools can mitigate risks to monetary and financial stability (e.g., Carney 2014).

conditions that had been taken into consideration in that context. Another notable example is the Riksbank, which has used its monetary policy press releases to note developments in household indebtedness fairly consistently since late 2012. The majority of other central banks have also discussed financial stability risks to some extent in their monetary policy press releases at various occasions in recent years.¹⁴

Even in cases where monetary policy decisions do not directly incorporate financial stability risks, speeches and monetary policy communications have been used to direct attention and, in some cases, suggest possible policy responses to these issues. For example, past speeches by US Federal Reserve officials have indicated that monetary policy was not deviating from a primary focus on price and output stability to address financial stability (Yellen 2014) but that it might do so in the future if financial imbalances grew rapidly (Brainard 2014). Speeches by the Reserve Bank of Australia (RBA) have been used to draw public attention to financial stability concerns and the role of the RBA in responding to these concerns (e.g., Ellis 2014, Edey 2013). Since 2014, the Riksbank has used many of its MPRs to assess and recommend macroprudential measures taken by the financial supervisory authority (FSA); in MPRs since October 2015, it has also called on the government to clarify the FSA's mandate for macroprudential policy. The ECB has argued that monetary policy must remain focused on price stability and rely on macroprudential policy to address financial stability risks (Constâncio 2015).

In some cases, how central banks interpret and communicate the interaction between financial stability and monetary policy closely reflects the development of its role in contributing to financial stability overall. In May 2013, for example, the RBNZ published a position paper indicating that it would take into account the interactions between monetary policy and macroprudential policy adjustments when making its policy decisions, following the signing of a five-year memorandum of understanding with the Minister of Finance defining the RBNZ's operating guidelines and governance arrangements for macroprudential policy.

Like the Bank of Canada, several other central banks conduct or commission regular reviews of their monetary policy frameworks.¹⁵ Such reviews indicate that financial stability considerations are playing a greater role in how central banks interpret their monetary policy frameworks.¹⁶ An evaluation of the Riksbank's monetary policy from 2010 to 2015 concluded that, by 2012, financial stability concerns had led the Riksbank to set its repo rate at a higher level than was justified by strict inflation targeting. The argument was made that this reflected in part the lack of clearly assigned responsibility for financial stability and macroprudential policy among Swedish authorities, and it was recommended that the government establish a macroprudential policy framework and clarify the Riksbank's contribution to the framework and to financial stability more generally (Goodfriend and King 2015).¹⁷

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¹⁴ We cannot directly compare the discussion of financial stability concerns in the monetary policy press releases across central banks because of the varying length, detail and frequency of these press releases.

¹⁵ See Table 1 of Lavigne, Mendes and Sarker (2012) for a review of renewal frameworks across central banks.

¹⁶ Financial stability concerns had been incorporated into some of these reviews by 2012 (e.g., the Bank of Canada's 2006 and 2011 reviews, the RBA's 2010 and 2013 Statements on the Conduct of Monetary Policy with the Government, and the RBNZ's September 2012 Policy Targets Agreement with the Government).

¹⁷ The Riksbank's role in promoting financial stability had also been reviewed in its previous 2005–10 evaluation.

Conclusion

There have been almost no changes to inflation targets in advanced economies over the past few years; indeed, only the Bank of Japan changed its numeric inflation target since 2012—and that change brought the Bank of Japan’s inflation target in line with international practice. However, other aspects of the monetary policy framework have evolved in response to the challenges facing central banks. Central banks have, for example, been innovative when introducing unconventional monetary policy measures into their policy tool kits to assist them in meeting their targets in the face of persistent disinflationary pressure. In some cases, these measures were introduced individually and, in others, as part of a package. This variation will help to provide further evidence on the effectiveness of unconventional tools.

Given the context of low inflation and large amounts of monetary stimulus, some central banks have also played a greater role in the area of financial stability since 2012 by taking on greater authority over micro- and macro-prudential policy, as well as by giving greater emphasis to financial stability considerations in their implementation of monetary policy.

Core inflation is an important element of the monetary policy frameworks of most central banks. There appears to have been little change in the basket of core inflation measures used by central banks or in their selection of a preferred, or focal, measure. Preliminary analysis suggests, however, that central banks have varied how they refer to core inflation over time, either with respect to their focal measure or the use of other measures to help explain inflationary developments. The analysis presented here can be expanded in many different ways to more formally test the information content of these changes.

Under flexible inflation targeting, central banks seek to return inflation to its medium-term target while mitigating volatility of other key economic and financial variables. The experience over the past few years has also highlighted the need for versatility in the tool kit used by central banks in achieving this objective, something that has been amply demonstrated by many central banks.

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