Inflation Targeting and the Global Financial Crisis: Successes and Challenges

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Abstract

Inflation targeting has become the predominant monetary approach across the globe. In a very real sense, "we are all inflation targeters now." Before, during, and after the financial crisis, nearly all central banks following an inflation-targeting approach—whether explicit or implicit—have been highly successful at achieving price stability and anchoring inflation expectations. Recent events, however, highlighted two critical issues for inflation targeting going forward: the constraint of the zero lower bound on nominal interest rates and the appropriate role of monetary policy in supporting financial stability. This has led to the development of alternative approaches to inflation targeting that offer, in theory, potential advantages with respect to the zero lower bound and financial stability.

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Twenty-five years ago the Reserve Bank of New Zealand bravely embarked on a new framework for monetary policy: Inflation Targeting. Today, some 20 central banks—representing economies from small to large, emerging markets to advanced—practice some version of inflation targeting.[1] Approaches differ in the details, but it is striking how similar inflation-targeting practice is across a diverse set of countries with distinct economic and institutional landscapes. Although the central banks of the three largest advanced economies—the Bank of Japan, the European Central Bank, and the Federal Reserve—don't explicitly identify themselves as practicing inflation targeting, all three have enunciated numerical longer-term inflation goals, a cornerstone principle of inflation targeting. To paraphrase Milton Friedman, "we are all inflation targeters now."[2]

This essay assesses the macroeconomic performance of inflation targeting and other central bank monetary policies during and after the global financial crisis and discusses two critical challenges for central banks in the future. Spoiler alert: My main conclusion is that inflation targeting and related approaches to monetary policy have been remarkably successful at providing a nominal anchor and keeping inflation low and relatively stable during a period of severe turbulence. Nonetheless, recent events have revealed some chinks in the armor of inflation targeting related to the zero lower bound on interest rates and financial instability—issues I will also address. I will conclude by outlining some alternative, as yet untested approaches that have the potential to improve inflation targeting, options for Inflation Targeting 2.0, if you will.

[1] See Kuttner (2004) for a concise summary of the history of inflation targeting and its spread across the globe.
[2] Milton Friedman is widely credited with coining the phrase "we are all Keynesians now" back in the mid-1960s.

Before turning to these issues, it is worthwhile to ask two basic questions: what is inflation targeting, and why has it become so widespread? At its core, inflation targeting is an answer to the oldest and thorniest problem of monetary policy: providing a nominal anchor for the economy. Past regimes—including the gold standard, pegged exchange rates, and targeting monetary aggregates—all sought to do so, but proved to be fatally flawed when it came to providing the flexibility to deal with economic cycles and crises. In a nutshell, inflation targeting is designed to anchor inflation expectations, enabling central banks to achieve greater macroeconomic stability in the short run, while ensuring price stability in the long run.

Although the implementation of inflation targeting differs across countries, three elements are central to the framework.[3] First and foremost is the announcement of an explicit quantitative inflation target coupled with the central bank's assuming responsibility for delivering price stability. Second is clear communication of the central bank's policy strategy and the rationale for its decisions, which enhance the predictability of the central bank's actions and its accountability to the public. Third is a forward-looking policy orientation, with a particular focus on inflation expectations. Together, these elements provide a focal point for inflation, facilitate the formation of inflation expectations, and provide a transparent framework for actions fostering price stability. It is important to note that, although inflation is front and center in each of these elements, inflation-targeting central banks also recognize a role for stabilizing economic activity—what is often referred to in the economics literature as "flexible inflation targeting."

[3] Numerous treatises have been written on inflation targeting. See, for example, Leiderman and Svensson (1995), Bernanke and Mishkin (1997), Bernanke et al. (1999), and citations therein.

Success at taming inflation has fueled wide adoption of inflation targeting (both explicit and implicit) over the past 25 years. Since the breakdown of the Bretton Woods international monetary system in the early 1970s, most countries have faced bouts of high and volatile inflation as they sought a suitable nominal anchor. Some chose to explicitly adopt an inflation-targeting framework with all the bells and whistles, while others did not. However, in the following, I do not distinguish between countries that have explicitly adopted inflation targeting and others, like the United States, whose behavior is in many ways similar to inflation targeting but which have not made such specific commitment.

Since the adoption of inflation targeting and similar approaches, inflation in these countries has been relatively quiescent. The first column of Table 1 shows the average rates of inflation in a number of countries in the decade before the global financial crisis (1998–2007). Compared to double-digit inflation rates in prior periods, nearly all of these countries experienced relatively low inflation rates in the run-up to the crisis. Inflation tended to be relatively stable as well, as shown in column 3 of the table, which reports the standard deviations of inflation rates in each country during this period.

Although the stabilization of inflation in so many countries was a great accomplishment, the real test for inflation targeting was yet to come. The global financial crisis and the resulting recessions presented a massive challenge for monetary policy. As has been widely remarked, inflation-targeting central banks generally did not foresee or forestall the ballooning risks to financial systems that eventually exploded. Moreover, central banks were not able to fully mitigate the spillovers to economic activity, and the resulting economic costs of the crisis proved enormous. These are subjects that I will return to later.

However, when gauged by the behavior of inflation since the crisis, inflation targeting delivered on its promise. Columns 2 and 4 of Table 1 report the average inflation rates and their associated standard deviations, respectively, since the beginning of 2008. Inflation rates stayed remarkably low and stable during this otherwise turbulent period. The crisis and economic downturns left virtually no traces in terms of the ability of central banks to maintain price stability. This is an important achievement in and of itself, but also because the stability of inflation provided many central banks with room to take aggressive actions to foster economic recovery.

What explains this impressive performance with regard to price stability? The key is the anchoring of inflation expectations before the crisis and the actions taken to maintain price stability, and thereby hold the anchor in place, during and after the crisis. Figure 1 shows the net change in survey measures of longer-run inflation expectations from the start of the crisis until today for a number of countries. In most cases, the anchor held firmly (to put these numbers in perspective, the inflation targets are typically between 2 and 3 percent). In a few cases, such as Japan and New Zealand, the observed shift represented a desirable move back toward the announced target. In only two other cases, Norway and the United Kingdom, do we see a nontrivial shift in inflation expectations. I will return to the case of Norway later.

With inflation expectations firmly anchored and the public apparently confident that central banks would hold the line on price stability, the transmission of economic turmoil to inflation was muted. Inflation (and, on the downside, deflation) proved to be the dog that didn't bite.

Two critical challenges

Despite inflation-targeting central banks' noteworthy successes in maintaining low inflation and anchoring inflation expectations during and after the crisis, inflation targeting faces two critical challenges. The first is the zero lower bound on nominal interest rates, which has constrained conventional policy actions for most major central banks during the past six years. The second is the appropriate role of monetary policy in maintaining financial stability.

The zero lower bound

The zero lower bound (ZLB) has been a significant constraint for many central banks across the globe. Figure 2 shows the policy rates for four major advanced economies since 1990. Combatting persistent deflation and a stagnant economy, the Bank of Japan moved its policy rate close to zero in the 1990s. Then, following the financial crisis, the Bank of England, the Bank of Japan, the European Central Bank, and the Federal Reserve all brought their policy rates to their respective effective lower bounds in late 2008 or early 2009. In addition, central banks in many other economies—including Canada, Denmark, Sweden, and Switzerland—cut policy rates to near zero in the aftermath of the crisis, as seen in Figure 3.

In countries where the ZLB has been a major constraint, achieving inflation goals has been especially challenging. In response to shocks that lower inflation below the target, the ability to lower short-term rates and stimulate the economy and thereby inflation is curtailed at the zero lower bound. This has been an ongoing problem for Japan, contributing to an extraordinarily long period of deflation. Central banks have turned to unconventional policies to mitigate the constraint of the ZLB, but even with these interventions, inflation has been persistently running below target levels in several countries in the aftermath of the crisis.

Although most central banks in emerging market economies and advanced economies rich in natural resources did not hit the ZLB during the recent episode, they did see interest rates reach very low levels in many cases. Historically, emerging market economies have typically experienced relatively high nominal interest rates, reflecting higher inflation and higher real rates than in advanced economies. All else equal, this elevated level of average interest rates reduces the chance of hitting the ZLB. Figure 4 shows policy rates for Australia, Chile, Mexico, Norway, and South Korea. In the cases of Chile and Norway, short-term rates did fall below 2 percent for a time.

So, how important an issue is the ZLB likely to be in the future? Are the events of the past decade a harbinger of regular future bouts with the ZLB or an outlier that won't be repeated? The answer to that question may be best found by looking further into the past rather than focusing on recent history.

In considering the likelihood of another bout with the ZLB, one important factor is the probability of another severe recession of the kind the United States and many other countries recently experienced.[4] If one tries to answer this question by looking at postwar U.S. data before the financial crisis, one would conclude that such an outcome is highly unlikely. For example, in the 50 years before the crisis, there was no year in which U.S. per capita real GDP fell by as much as it did in 2009, the worst year of the recession. A statistical analysis of the U.S. data over the 50 years prior to the crisis would lead one to expect a downturn of this magnitude or larger once every 430 years.[5] The data would show an even greater sense of complacency if one based this calculation solely on the 25 years leading up to the crisis—the so-called Great Moderation

[4] This discussion is based on Williams (2014).
[5] This calculation is taken from Williams (2014). It assumes the variance of the growth rate is set equal to that observed in the U.S. data over 1958–2007 and that the distribution of outcomes is normally and independently distributed.

period. In that case, such a drop in output would be expected to occur only once every 33,000 years! This extremely optimistic prediction reflects the unusually tranquil quarter-century before the global financial crisis.

A very different conclusion is reached when one considers a broader view of historical experience. If, instead of concentrating on the U.S. postwar experience, one includes the history of numerous countries over more than a century, then deep recessions are not that rare.[6] Specifically, analysis of data from 17 advanced countries over the past 140 years (1871–2012) shows a decline in per capita real GDP of the magnitude experienced in the United States in 2009 occurs, on average, about once every 20 years. Using this metric, the recent U.S. recession is far from unprecedented or an outlier. A broad view of history teaches us that very large downturns are not only possible, they are common.

The point of this example is that the assessment of tail risks—and thereby the incidence of the ZLB—depends on the breadth of economic experiences that one considers relevant. Looking at broad international experience over a protracted period is likely to mute the overconfidence garnered by a more limited set of data points. It rejects the "this time is different" view that downplays distant events, and instead treats a wide range of historical experience as potentially informative in describing the types of risks the future may hold.

A second factor influencing the incidence of ZLB episodes is the level of the normal or "natural" real rate of interest expected to prevail over the foreseeable future. This is because the lower the natural rate of interest, the thinner the available cushion to lower rates when needed. A

[6] Following Jordà, Schularick, and Taylor (2011), the data are taken from Barro and Ursúa (2010), and updated for 2007–2012 using data from the World Bank. For the United States, data for 1930–2012 are the current national income and product accounts data from the Bureau of Economic Analysis. The countries in the sample are Australia, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United States.

number of factors—including persistent changes in productivity growth, demographics, pricing of risk, and fiscal policy—potentially affect the natural rate of interest. In my research with Thomas Laubach, we developed a statistical model that provides estimates of the natural rate of interest for the United States.[7] Figure 5 shows these estimates, compared with the medium-term forecasts of the real federal funds rate from the 2014 Blue Chip Financial Forecasts survey.

Both the model-based and survey-based estimates of the medium-term natural rate of interest show significant declines since the onset of the global financial crisis. It is too early to judge whether this downward shift in the natural rate will endure. However, if it does, then it raises the specter of the ZLB being a more frequent problem than in past decades when the natural rate of interest was higher.

In summary, based on the broader historical experience and potential for a lower level of the natural rate of interest, the ZLB is likely to be a recurring issue for central banks that target low levels of inflation. This analysis has focused on advanced economies, particularly the United States. Although most emerging market economies have not yet been constrained by the ZLB, this situation may change. Looking to the future, circumstances may be different—commodity prices may not be booming as they did during the global financial crisis, and global growth trends and real interest rates may be lower—with the result that the ZLB may become a more palpable constraint on monetary policy, even in emerging market economies.

A monetary policy mandate for financial stability?

The second challenge concerns the appropriate role for monetary policy in sustaining a stable financial system. From the beginning, the inflation-targeting approach has focused on a single outcome: price stability. As I have argued, according to this measure, inflation targeting

[7] Laubach and Williams (2003).

has been an unmitigated success. But the global financial crisis has called into question whether a singular focus on price stability suffices, and some have argued that monetary policy should be directed at minimizing risks to financial stability as well.

In this regard, it is important to recall that the near single-mindedness regarding the nominal anchor was originally seen as a virtue, not a vice. Muddying the waters by adding concern for financial stability was typically viewed as a potentially dangerous distraction, risking policymakers' attention to, and credibility in, maintaining price stability. Indeed, this attitude was codified in numerous central bank charters, which in some cases dictated consequences if the inflation goal was not met.

To be sure, the elevation of financial stability concerns at central banks and other regulatory agencies is a natural and appropriate reaction to the events of the global financial crisis, when the near meltdown of the financial systems in many countries almost toppled the global economy. Even with the dramatic—and in many cases, unprecedented—actions of governments and central banks, the fallout from the financial crisis has been greater and longer-lasting than had been experienced in generations. In fact, this renewed concern for financial stability represents more a return to the roots of central banking than new-age thinking. After all, the Federal Reserve was created from the ashes of the panics and resulting depressions that tormented the U.S. economy in the late 19th and early 20th centuries.

It has become a mantra in central banking that robust micro- and macro-prudential regulatory and supervisory policies should provide the first and second lines of defense for financial stability. Still, some are concerned that is not enough and call for including a financial stability goal in the monetary policy mandate as well. Doing so, however, raises the important

issue of how one commits to taking financial stability into account while simultaneously preserving the nominal anchor. If financial stability and price stability goals are in conflict, there is a risk that price stability will be subordinated to the financial stability goal, with serious long-run consequences for economic performance.

This issue of the appropriate role of monetary policy in fostering financial stability at the potential cost to inflation goals has been playing out in policy debates and decision in two Scandinavian countries: Norway and Sweden. In discussing these examples, let me be absolutely clear that I am not judging the wisdom of these decisions. Rather, they provide useful case studies of the possible tradeoffs between financial stability and inflation goals that we can and should learn from.

Take the case of Sweden. As background, Sweden's economy has experienced inflation persistently below target, while at the same time, household debt and house prices have grown enormously. In response to the growing level of debt and the potential risks to financial stability it entailed, the Sveriges Riksbank undertook a somewhat tighter stance of monetary policy than it would otherwise have, were it based purely on macroeconomic conditions. The predicted result was a more gradual return to inflation and unemployment goals (Sveriges Riksbank 2014a, p. 17). Similarly, in Norway, the Norges Bank framed a recent policy decision as follows: "Both the objective of keeping consumer price inflation close to 2.5% and the objective of sustaining capacity utilization in the years ahead could in isolation imply a somewhat lower key policy rate forecast.… On the other hand, a lower key policy rate may increase the risk of a further buildup of financial imbalances" (Norges Bank 2014, p. 16).

These examples illustrate the tradeoff between price and macroeconomic goals on one hand, and financial stability goals on the other, when using monetary policy to mitigate risks to financial stability. For example, Lars Svensson (2013, and references therein) uses model simulations to show that the monetary policy actions of the Riksbank, based on a concern for financial stability, have induced a significantly higher rate of unemployment and a sustained shortfall of inflation relative to its target. He goes on to argue that the policy, by reducing income, has actually increased the already high household debt-to-income ratio, potentially exacerbating financial stability risks.

These calculations focus on the short-run costs of these policies; the more significant issue is whether concern for financial stability undermines the nominal anchor. If the central bank actions aimed at addressing financial stability risks are large and persistent, the inflation rate will likely deviate from target for many years. The protracted failure to deliver on the inflation objective could undermine the credibility of the central bank's commitment to its inflation target and unmoor inflation expectations.

In this regard, it is instructive to examine the behavior of inflation expectations in Norway and Sweden. Figure 6, based on Levin (2014), shows survey data on longer-run measures of inflation expectations for the United States, the euro area, Norway, and Sweden. Longer-run inflation expectations have remained very stable in the United States and euro area, despite the tumult of the global financial and euro crises and the subsequent aggressive monetary policy undertaken by the Federal Reserve and the European Central Bank. In contrast, Norway and Sweden saw some slippage in long-run inflation expectations below target levels, based on

this survey.[8] This follows a long period of realized inflation averaging below-target levels and central bank communication that financial stability concerns have been affecting policy decisions. Interestingly, the Riksbank cut the policy rate in July 2014, arguing that "expansionary monetary policy can also contribute to inflation expectations remaining anchored around 2 per cent by sending a clear signal that monetary policy will ensure that inflation approaches the inflation target within the reasonably near future" (Sveriges Riksbank 2014b). Subsequently, longer-run inflation expectations bounced back, as seen in the chart.

So far, it's unclear how durable a slippage in inflation expectations resulting from a focus on financial stability concerns will prove to be. Nonetheless, it is an apt reminder of the potential long-run costs of losing sight of the price stability mandate. The steadfastness of the nominal anchor in most advanced economies has been, and continues to be, a key factor in many central banks' ability to maintain low and stable inflation during and after the global financial crisis. It was forged over many years of consistent commitment to price stability and successfully taming the inflation dragon. If the anchor were to slip, it would wreak lasting damage to a central bank's control over both inflation and economic activity, at considerable cost to the economy. This applies equally to deviations above and below the target.

Inflation Targeting 2.0

The two challenges that I have highlighted—the ZLB and the role of monetary policy in support of financial stability—are not entirely new, but the events of the past seven years have highlighted their importance for central banks. Much of the research and discussion has been centered on how to adapt the existing monetary policy framework to account for and mitigate the

[8] I should note that other surveys show smaller downward movements in long-run inflation expectations. See Norges Bank (2014) and Sveriges Riksbank (2014a).

negative effects of these issues. For example, real-world experience with the ZLB has led to the development and use of various unconventional policy approaches such as forward policy guidance and variations on using the central bank's balance sheet to affect financial conditions.[9] Similarly, recognizing the need for a more resilient financial system has led to the introduction of stronger and more comprehensive micro- and macro-prudential regulations and supervision.

Beyond adapting inflation targeting to these realities, there remains the question of whether the inflation-targeting framework itself should be modified or replaced by a new regime better suited to deal with the ZLB and financial stability concerns. Given the limitations and costs of using unconventional policies and the residual risks to the financial system even with stronger regulation, is there an alternative approach to monetary policy that may engender more favorable tradeoffs? In other words, after 25 years of inflation targeting, is it time for a reboot to Inflation Targeting 2.0? In the following, I am not advocating any particular position, rather I am highlighting some research on alternative approaches to inflation targeting that may have advantages with respect to the ZLB and financial stability.

Two closely related alternatives to inflation targeting have been proposed: price-level targeting and nominal income targeting. Under price-level targeting, the central bank aims to keep the price level on a predetermined growing path. It differs from inflation targeting in that past deviations from the target rate of inflation must be made up by offsetting deviations in the other direction. Nominal income targeting is similar, but posits a deterministic growing path of nominal GDP that the central bank aims to achieve. In the following, I first consider the merits of price-level targeting and then turn to nominal income targeting.

[9] See Williams (2013) for a discussion.

In theory, price-level and inflation targeting are close cousins, with relatively little to distinguish them in terms of macroeconomic outcomes in "normal" times (Williams 2003). Both approaches aim for a low average rate of inflation and put price stability front and center as a goal of monetary policy. However, price-level targeting possesses some potential advantages over inflation targeting in mitigating both the economic repercussions of the ZLB and risks to financial stability.

The difference between price-level and inflation targeting really shows up in situations of negative shocks to the economy when inflation falls well below the targeted level. With inflation targeting, monetary policy acts to bring inflation back to the target level, with past misses below target ignored: that is, bygones are bygones. In contrast, price-level targeting requires more aggressive monetary policy action that promises future above-target inflation needed to bring the price level back up to its desired path. This promise of sustained future monetary stimulus provides a powerful pull on an economy experiencing disinflationary pressures, even in the presence of the zero lower bound. Indeed, according to model-based research, a price-level targeting central bank can, in theory, successfully target a very low trend inflation rate with very little cost in terms of macroeconomic stabilization resulting from the ZLB (Reifschneider and Williams 2000, Svensson 2001, Eggertsson and Woodford 2003, Williams 2006).

Price-level targeting also has potential positive attributes related to financial stability. Because debt contracts are typically written in nominal terms, a period of unexpectedly low inflation or even deflation causes the real value of debt to rise relative to expectations when the contract was signed. This can contribute to weakening of households', businesses', and banks' balance sheets, resulting in a decline in economic activity and greater stress in the financial

system. Under inflation targeting, the increase in the real value of debt is not reversed. In contrast, if the central bank acts to keep overall prices on a steady growth path, then episodes of excessively low inflation or deflation are eventually reversed, mitigating this type of debt deflation problem and the deadweight losses and disruptive effects associated with foreclosure and bankruptcy. In this way, price-level targeting has the potential to reduce the risks to the financial system and spillovers to the economy from debt-fueled booms.

Nominal income targeting takes these arguments a step further. Instead of a price path that sets the goal for policy, it's a path for nominal GDP. In terms of the ZLB, nominal GDP targeting shares the advantage of price-level targeting: Specifically, it promises higher inflation in the future following a period of low inflation that helps dampen deflationary pressures. On the financial stability front, it may be an even more powerful deterrent to debt-fueled crashes. If aggregate nominal income is kept close to a steady growth path, then on the aggregate, incomes won't fall as much during a downturn, allowing people to continue to repay their loans and avoid default and bankruptcy (Koenig 2013 and Sheedy 2014).

These potential benefits of price-level and nominal income targeting are worthy of further careful study and discussion. It is too early to judge whether one approach or the other would provide a better framework than inflation targeting. In contemplating a shift away from inflation targeting, it is crucial to consider what unintended negative consequences these approaches might entail. For example, nominal income targeting could generate persistent deviations of inflation from target, which may interfere with the credible communication of the price stability objective. There are also practical considerations in the communication of policy decisions and goals that need to be fully analyzed. In weighing all the potential advantages, disadvantages, and

risks of these and other alternative approaches, it is absolutely essential that any modification of approach not undermine the hard-fought achievement of price stability and well-anchored inflation expectations that have been of great benefit, especially during the recent challenging economic times.

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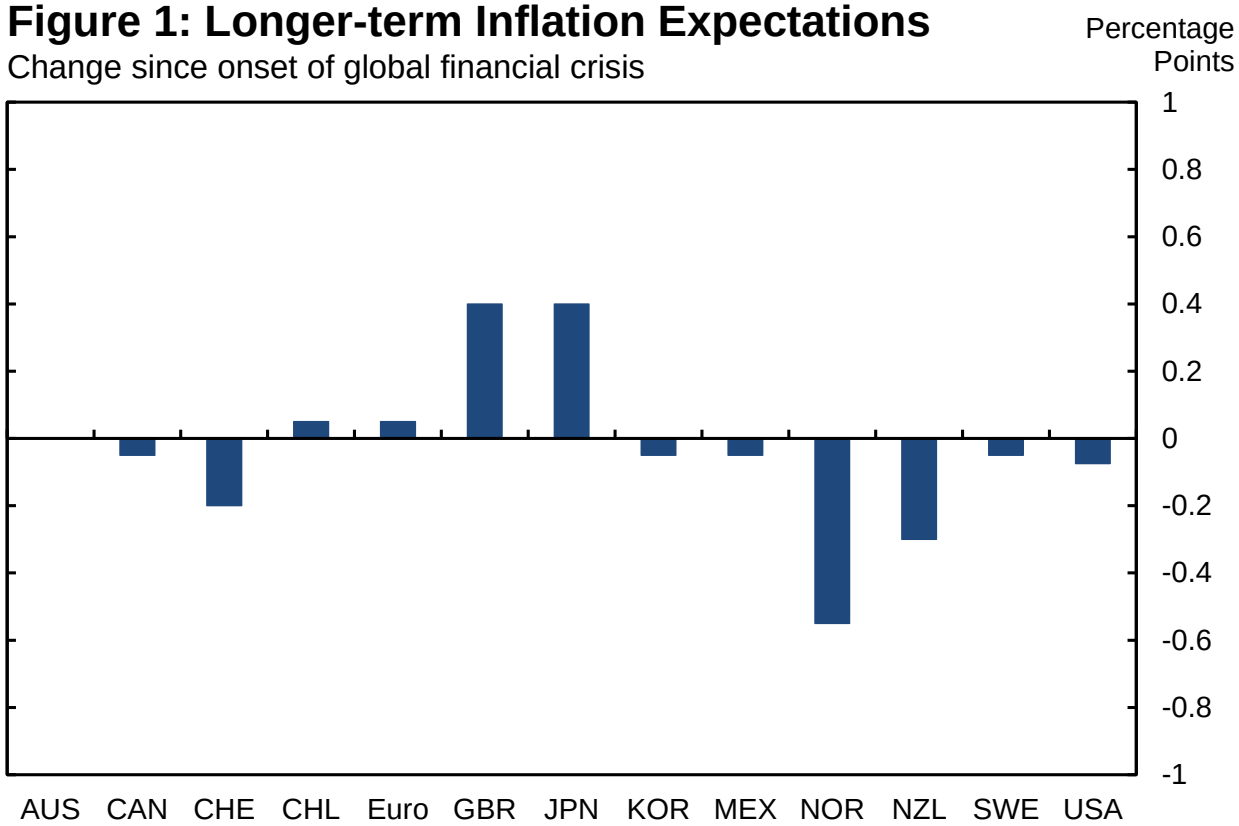
Table 1. Consumer Price Inflation

	Mean		Standard Deviation	
	1998Q1-2007Q4	2008Q1-2014Q2	1998Q1-2007Q4	2008Q1-2014Q2
Australia	2.8	2.8	1.3	0.9
Canada	2.2	1.6	0.9	1.0
Chile	3.3	3.2	1.3	2.9
Euro Zone[a]	2.0	1.9	0.5	1.1
Japan	-0.2	0.1	0.6	1.2
Mexico	7.4	4.3	4.8	0.9
New Zealand	2.2	2.4	1.1	1.4
Norway	2.0	2.1	1.1	1.0
South Africa	4.9	6.3	3.4	2.0
South Korea	3.2	2.9	1.8	1.2
Sweden	1.2	1.2	1.0	1.5
Switzerland	0.8	0.3	0.5	1.1
United Kingdom	1.6	3.1	0.5	0.9
United States	2.6	2.0	0.8	1.5

Source: Euro Zone data from IFS; all else from OECD.
[a] The country composition of the Euro Zone has varied over time.

Figure 1: Longer-term Inflation Expectations

Change since onset of global financial crisis



Source: Consensus Forecasts and SPF (USA). Change in 6-10 year-ahead CPI inflation expectations between 2007 and 2014.

Figure 2: Short-term Interest Rates

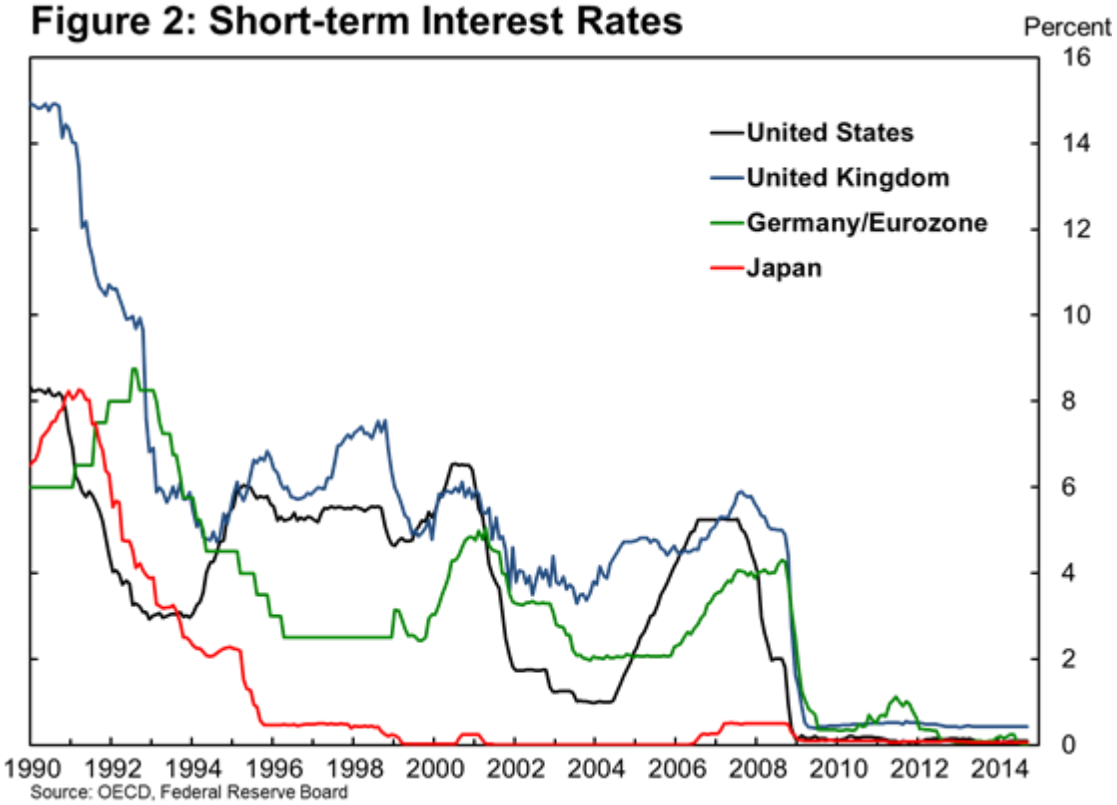


Figure 3: Short-term Interest Rates

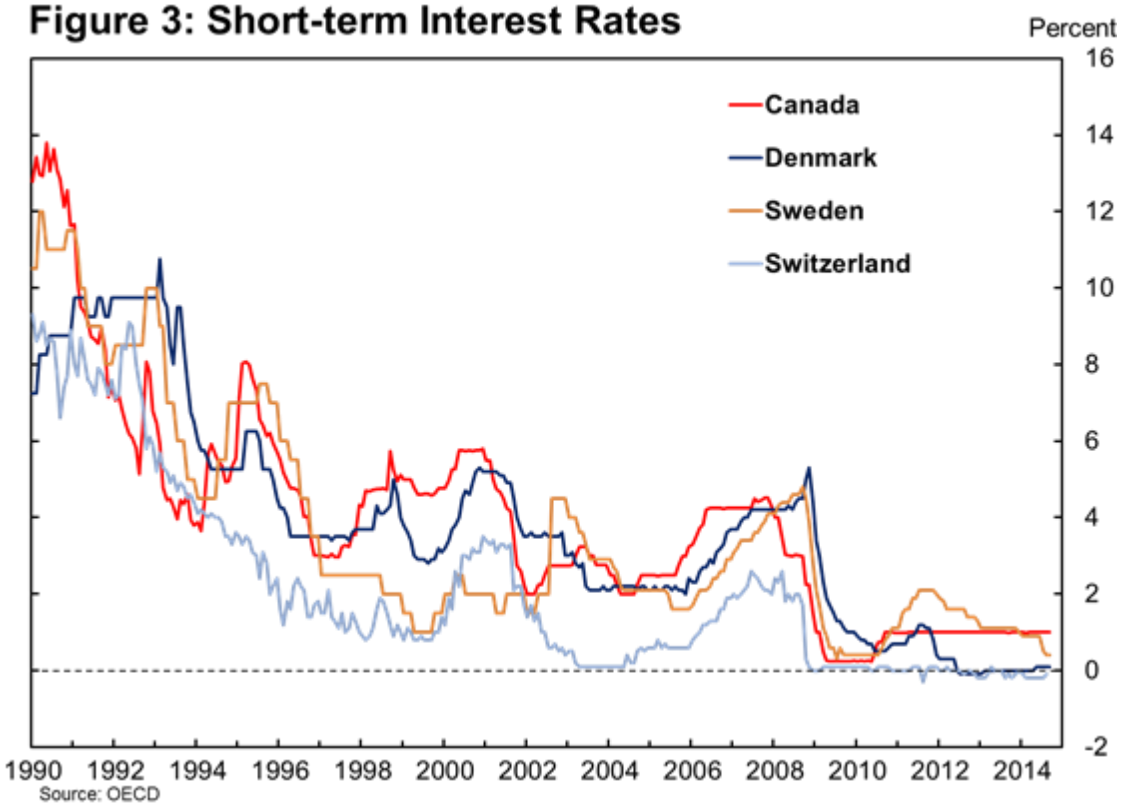


Figure 4: Short-term Interest Rates

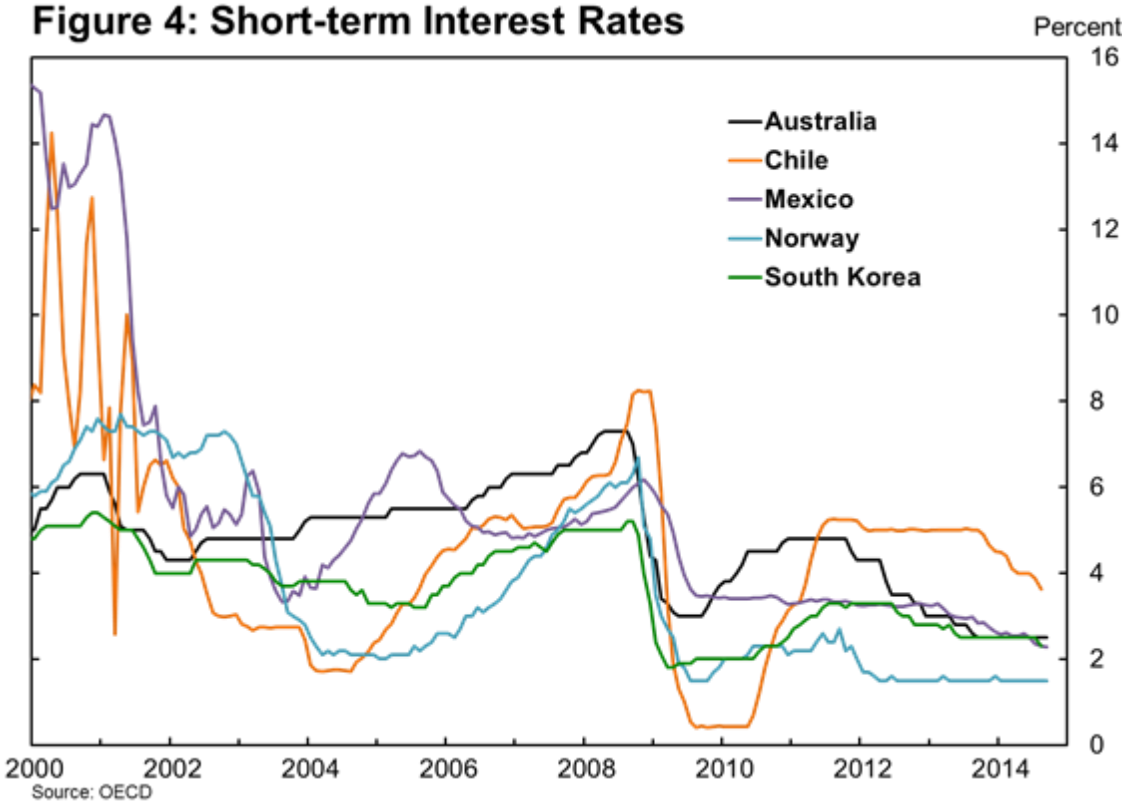


Figure 5: Estimates of the U.S. Natural Rate of Interest

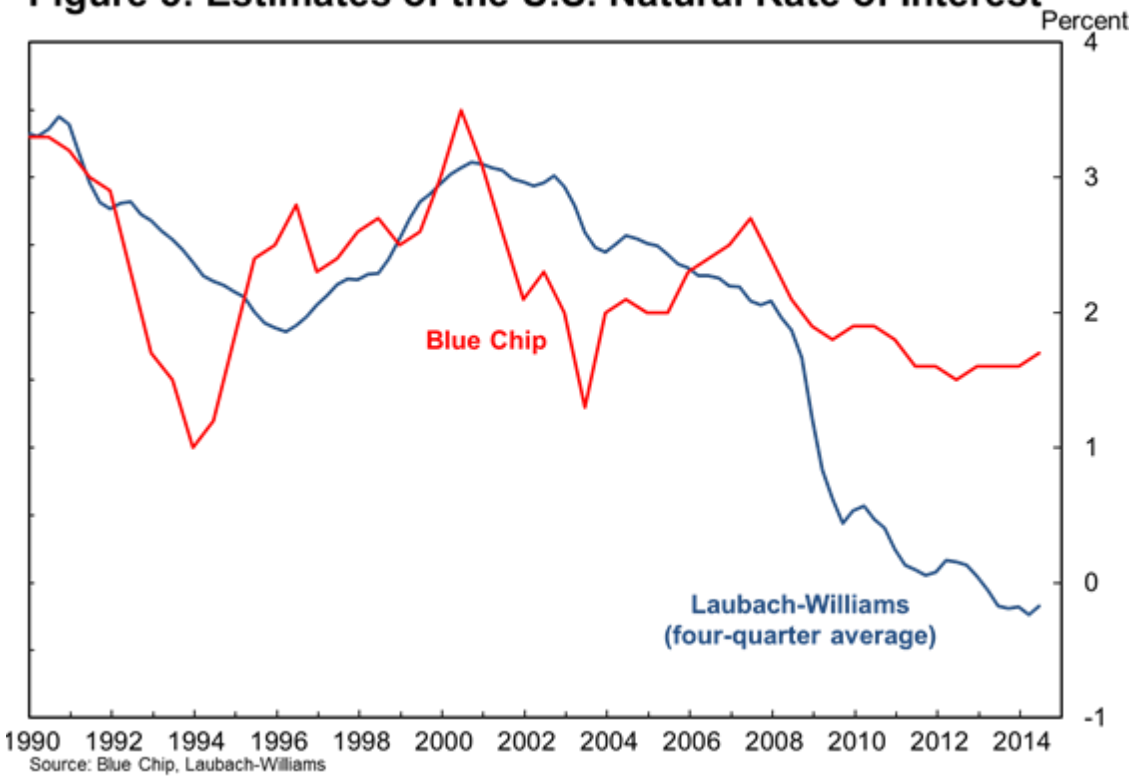
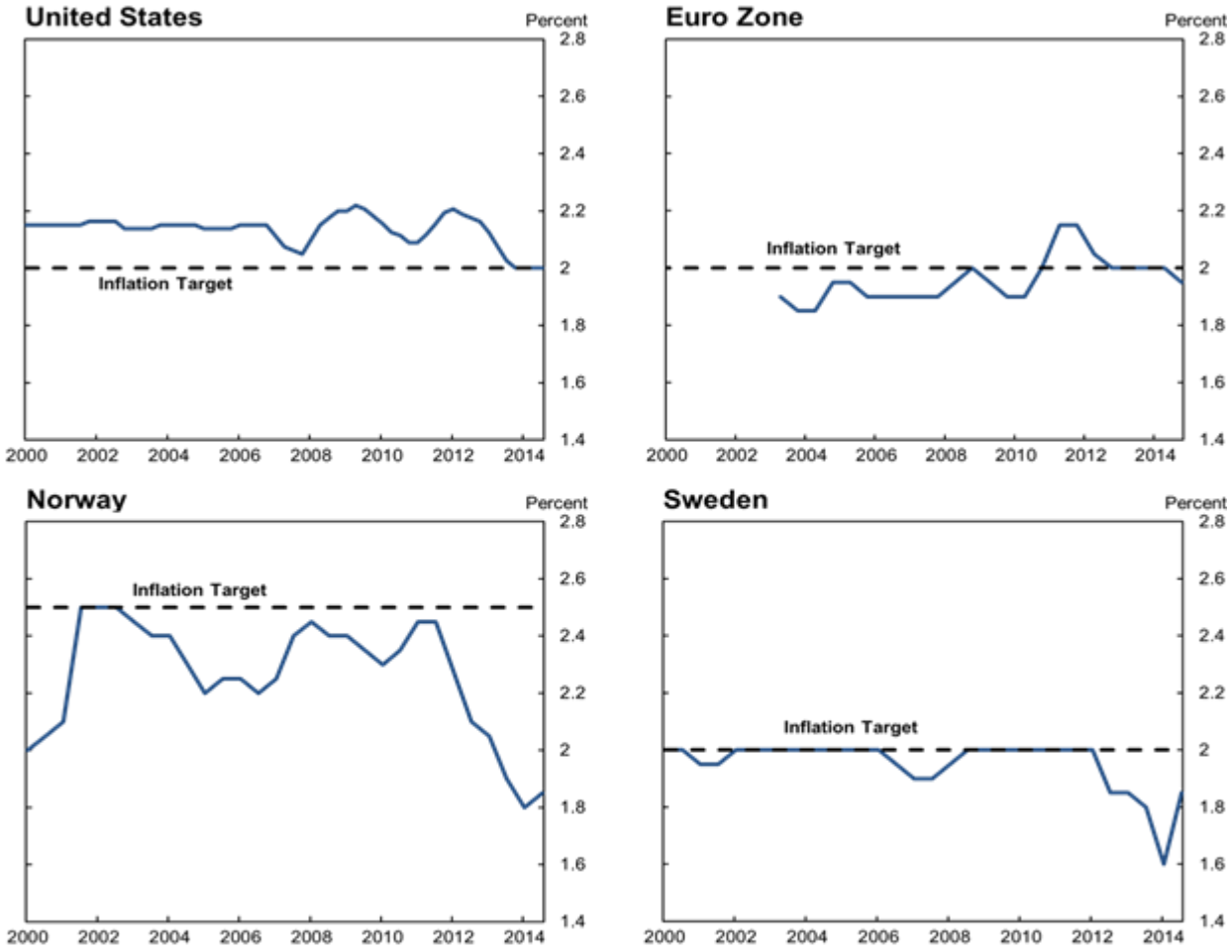


Figure 6: Longer-run Inflation Expectations



Note: Each panel depicts the central bank's inflation target with a dashed black line and the evolution of inflation expectations with a solid blue line. Inflation expectations for non-U.S. countries is defined as the average of the last two semiannual Consensus Forecast surveys of CPI inflation projections 6 to 10 years ahead. Inflation expectations for the United States for 2007 and after is the 4 quarter average of the 10-year PCEPI inflation forecast from the quarterly Survey of Professional Forecasters (SPF) and an adjusted 10-year CPI inflation forecast from the SPF prior to 2007.