

A New Era of Central Banking: Unconventional Monetary Policies

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- When conventional monetary policies come close to their limit, central banks can provide additional easing with unconventional policies.
- The international experience has been largely positive. Costs associated with these measures could, however, rise with extensive and prolonged use.
- When used simultaneously, unconventional measures can often be mutually reinforcing but can also lower the effectiveness of individual measures in some cases.
- Another challenge major central banks need to carefully plan for, manage and communicate is how and when to exit from such measures.

Over the past decade, central banks acted aggressively to counter the adverse effects of the global financial crisis and its aftermath, operating in uncharted waters as they implemented “unconventional monetary policies” (UMPs) such as quantitative easing (QE) and, more recently, negative policy interest rates.¹ While these interventions and many others introduced since the 2007–09 global financial crisis were initially thought to be temporary, some are expected to remain in place for longer than expected.² The unconventional is increasingly becoming conventional, and UMPs have established themselves as part of any modern central bank’s tool kit.

A thorough assessment of their effectiveness and potential implications is essential for the sound conduct of monetary policy.³ This is all the more pertinent as the neutral rate of interest—the rate of interest that would prevail with full employment and stable inflation in the medium term—has likely declined both in Canada (Mendes 2014) and abroad (Hamilton et al. 2015). This implies that, all else being equal, central banks will reach the limits of conventional monetary policy easing more often and the use of UMPs could become more likely than in the past. Yet, policies that have

¹ This article uses the terms QE and large-scale asset purchases (LSAPs) interchangeably. The term “conventional monetary policy” refers to adjusting the key policy rate (Bank of Canada 2015), whereas the term “unconventional monetary policies” or, interchangeably, “non-standard measures” includes, but is not limited to, QE and negative interest rates.

² Other measures include, but are not limited to, liquidity facilities (involving the provision of liquidity by central banks to address elevated pressures in term funding markets), credit facilities (measures aimed at restoring the functioning of a particular credit market and promoting bank lending), and forward guidance (central bank communication regarding the future path of the policy rate).

³ UMPs are deemed effective if they are able to support economic activity and inflation by providing further easing of financial and monetary conditions.

been introduced to improve the resilience of the financial system reduce the future likelihood of financial crises (Côté 2014) and potentially the need for implementing UMPs.

This article reviews the international experience with UMPs, focusing on QE, and briefly discusses negative interest rates.⁴ It first discusses the channels through which these measures work and evidence of their effectiveness. It then examines the potential costs and the limits of these tools. This is followed by a discussion of the simultaneous use of multiple UMPs. A brief assessment of exit considerations is followed by a discussion of the broader implications for monetary policy.

The International Experience

Current measures

Central banks have introduced a wide range of measures that have evolved over time (see Reza, Santor and Suchanek [2015] for a summary). In each case, the measures were tailored in their nature, size and vigour to conditions specific to the country in which they are being implemented. Recently, monetary policy stances have begun to diverge: policy normalization has started in the United States with the Federal Reserve raising the policy rate late last year, and the Bank of England continues to prepare market participants for an eventual increase as well. They have nevertheless maintained the level of asset holdings and thus the size of their balance sheets in both cases. In contrast, the Bank of Japan, the European Central Bank (ECB) and some other European central banks (such as the Swedish Riksbank) have continued to expand their respective asset purchase programs to provide further monetary accommodation (Chart 1).

In addition, several central banks have lowered policy rates into negative territory (Chart 2). The ECB, for example, lowered its deposit rate below zero in June 2014 and cut it further three times, most recently to -0.4 per cent in March 2016. The policy rates at the central banks of Japan, Denmark, Switzerland and Sweden have also all gone negative.

Transmission channels and effectiveness

The channels through which asset purchases affect financial markets and transmit to the real economy, as well as evidence of their effectiveness, have been widely discussed (Poloz 2015; Reza, Santor and Suchanek 2015). QE pushes up the price of, and reduces the yield on, the purchased assets, thereby flattening the yield curve of the purchased asset class (Chart 3). There are multiple channels through which lower market interest rates are expected to improve domestic financial and economic conditions. Financing costs of firms and households are reduced, with lower interest rates providing incentives to increase borrowing.⁵ At the same time, lower interest rates are lifting asset prices as investors are encouraged to shift out of government bonds into riskier assets. Higher asset prices can in turn create a

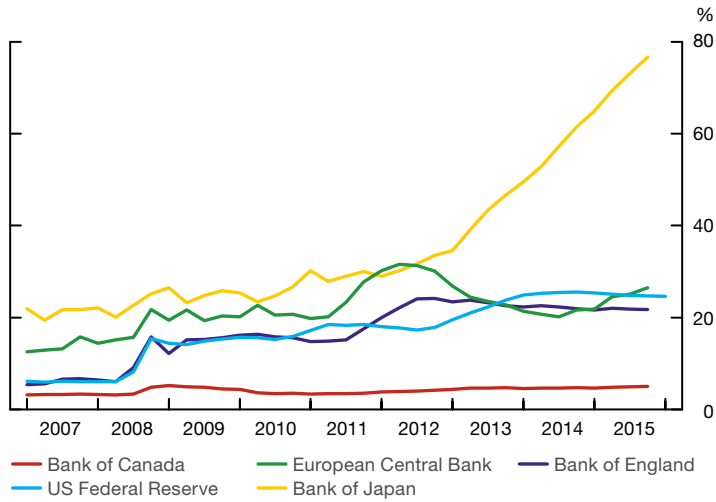
◀ *There are multiple channels through which lower market interest rates are expected to improve domestic financial and economic conditions*

⁴ This article concentrates on the international experience with non-standard policy measures. For a discussion of options in the Canadian context, see the recently published *Framework for Conducting Monetary Policy at Low Interest Rates* (Bank of Canada 2015) and a speech by the Governor of the Bank of Canada (Poloz 2015).

⁵ QE may also have more indirect effects on private sector borrowing through balance sheet effects. If firms are able to borrow at a lower rate to pay off a debt that carries a higher rate, for example, their balance sheet position would improve, which could imply more investment spending at the margin in the future. Similarly, households may refinance mortgages at lower rates, improving their balance sheet position.

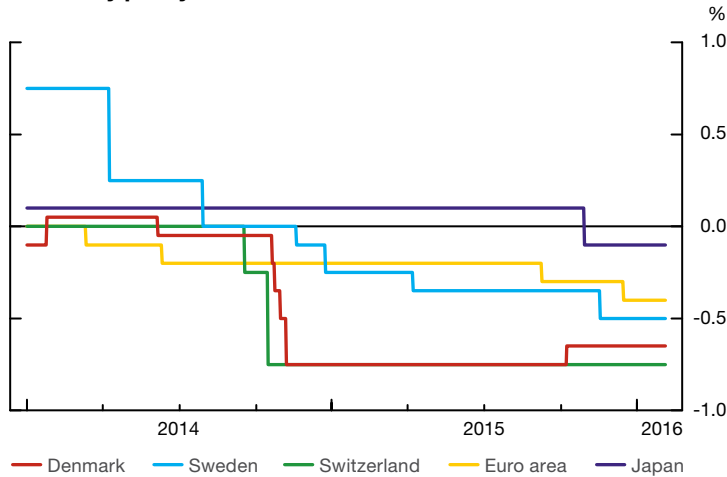
Chart 1: Total assets on central bank balance sheets

As a percentage of GDP, quarterly data



Sources: Statistics Canada; US Federal Reserve, US Bureau of Economic Analysis; European Central Bank; Bank of Japan, Cabinet Office of Japan; Bank of England, Office for National Statistics; and Bank of Canada calculations
 Last observations: United States, 2016Q1; all others, 2015Q4

Chart 2: Monetary policy interest rates



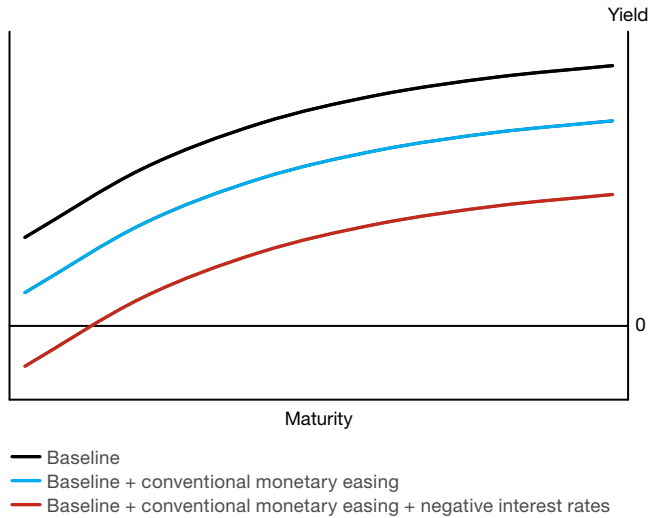
Notes: Denmark—certificate of deposit rate; Sweden—repo rate/rate of interest on Riksbank certificates; euro area—deposit rate; Switzerland—midpoint of target range for three-month London Interbank Offered Rate; Japan—rate on outstanding balance of financial institution’s current account
 Sources: Danmarks Nationalbank, Sveriges Riksbank, Swiss National Bank, European Central Bank
 Last observation: 5 May 2016

wealth effect that boosts spending and confidence. And finally, by affecting expected interest rate differentials, QE puts downward pressure on the exchange rate, providing impetus to aggregate demand through improved price competitiveness of domestic production.

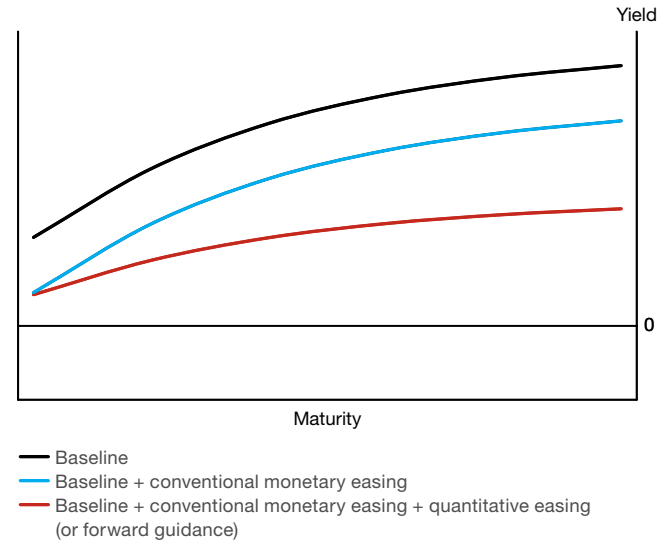
International evidence to date provides policy-makers with reasonable confidence that QE has served its purpose of providing significant monetary and financial easing. In particular, numerous studies have found that QE has lowered the interest rates not only on purchased assets but also on other

Chart 3: Effect of UMPs on yield curve (illustrative example)

a. Negative interest rates shift the yield curve down at all maturities



b. Quantitative easing (and forward guidance) flatten the yield curve



types of debt.⁶ While more difficult to measure, researchers have also estimated the macroeconomic impacts of QE using a variety of models and methods and have concluded that asset purchases by major central banks had a sizable impact on GDP growth and inflation,⁷ ultimately helping central banks achieve their mandated objectives. QE may thus be seen as a substitute for conventional monetary policy when policy rates are close to the effective lower bound (ELB).

◀ *Quantitative easing may be seen as a substitute for conventional monetary policy when policy rates are close to the effective lower bound*

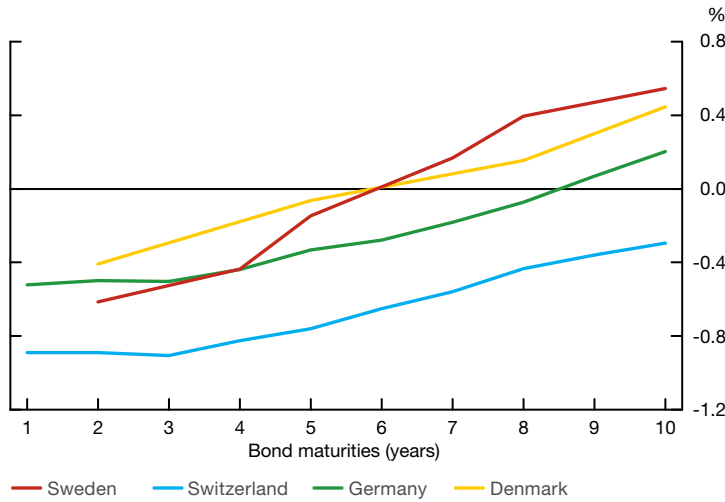
Turning to negative interest rates, the channels of transmission are similar to those of conventional easing (Jackson 2015; Hannoun 2015), shifting the yield curve down at all maturities (Chart 3), rather than primarily at longer maturities as is the case with QE. While the experience is much more limited than with QE, the evidence is encouraging: short-term money market rates have declined and easing has been transmitted to assets of longer maturity (Chart 4). In jurisdictions that went negative, a significant proportion of the outstanding marketable government debt is now trading at negative interest rates. Yet, the pass-through of negative rates to market rates has been incomplete, suggesting that the monetary policy transmission mechanism may have become weaker (Witmer and Yang 2016). Moreover, the degree to which negative rates will be able to boost economic growth and support inflation has yet to be seen.

⁶ For a review of empirical evidence, see IMF (2013) and Reza, Santor and Suchanek (2015). In particular, studies estimate the cumulative effects of the QE programs by the US Federal Reserve between 90 basis points (bps) and 200 bps. In the United Kingdom, estimated cumulative effects range from 45 bps to 160 bps. In Japan, the IMF (2013) estimates that purchases of government bonds under the policies of comprehensive monetary easing and quantitative and qualitative monetary easing reduced 10-year yields by about 30 bps. One common caveat, however, is that evidence of lower interest rates is usually based on the yields on existing debt, rather than on funding costs of firms for new borrowing. Thus, if access to credit is constrained and the borrower cannot take advantage of lower yields or rates, the transmission may not be as effective if borrowers do not benefit from lower market rates.

⁷ Researchers have constructed counterfactual scenarios using structural dynamic stochastic general-equilibrium models, as well as semi-structural or reduced-form econometric models, for instance (IMF 2013; Reza, Santor and Suchanek 2015). There is, however, an important uncertainty around the estimated macroeconomic effects of QE and conclusions from these studies should be viewed with caution.

Chart 4: Government bond yield curves

As at 4 May 2016



Source: Bloomberg

Challenges Ahead

Despite the rapidly growing evidence on the mechanics, effects and implications of UMPs, important issues remain. Specifically, there are many potential costs to such measures. While some of these costs are associated with prolonged monetary easing more generally, in what follows, we concentrate on the risks specifically related to UMPs such as QE.

◀ *There are many potential costs associated with unconventional monetary policy measures*

Unintended consequences of unconventional monetary policies

Critical observers have noted that extraordinary policy measures can lead and have led, in certain cases, to distressed market functioning and have contributed to increased risk in the financial system. In the case of QE, market functioning may be affected for two main reasons.

First, QE decreases availability of safe assets that provide important services, such as collateral. In particular, long-term government bonds provide a money-like safe-haven service to certain investors, such as institutional investors (which have to hold these high-quality liquid assets to comply with regulatory requirements). Moreover, the same assets can be used as collateral multiple times in a chain of financial transactions, amplifying their role for liquidity in the financial system (Claessens et al. 2012). Because QE removes a fraction of the safe assets from the financial system, QE may be detrimental to market functioning (Stein 2012) and even reduce welfare (Krishnamurthy and Vissing-Jorgensen 2013).

Second, if the central bank’s asset holdings constituted a significant share of outstanding supply, price discovery could be compromised and liquidity premiums would increase. While such impairment to financial market functioning could, if prolonged, hamper real economic activity, it is unclear at this time whether existing QE programs have led to the perceived shortage of safe collateral or whether this is the result of a host of other factors, such as enhanced liquidity and capital requirements under Basel III and changes in bank business models (CGFS 2013).

Similarly, there are some concerns about the impact of negative interest rates on financial market functioning, in particular for financial assets with payoffs that are explicitly or implicitly constrained from going below zero (for a more detailed discussion, see Witmer and Yang 2016). Others have voiced concerns that reduced bank profitability as a result of negative interest rates could compromise the soundness of the banking system. While such frictions on their own may not limit the pass-through of negative nominal policy rates to the real economy, the combination of several of them may well do so (Alsterlind et al. 2015), potentially hampering the economic recovery (McAndrews 2015, Cœuré 2014).

A more general concern about UMPs aimed at reducing long-term yields is that they lead investors to increase their exposure to risky assets, as well as to interest rate risk, in their search for yield (Hannoun 2015).⁸ While this is a key channel through which both QE and negative interest rates are designed to work, prolonged periods of excessive risk taking can contribute to financial imbalances through asset price over-valuation and weak credit standards.

Factors influencing the effectiveness of unconventional monetary policies

It is important to acknowledge that the economic context influences how well UMPs function, implying that the experience to date is an imperfect guide to anticipate the effectiveness of such policies in the future. In other words, their success is state-dependent. For example, many of the UMPs implemented during the crisis when financial markets were impaired have had important effects on bond yields, but these effects would likely become smaller as liquidity improves (Rogers, Scotti and Wright 2014). Similarly, the effectiveness of QE might be more limited in small open economies because government bond yields are highly correlated with international bond yields through global term premiums.⁹ The impact of QE may moreover be context-dependent in the sense that the transmission through the bank lending channel depends on the structure of financial markets (Butt et al. 2014).

A related observation is that subsequent rounds of QE had smaller effects on financial conditions compared with the first round of purchases, which is indicative of decreasing returns to scale (Krishnamurthy and Vissing-Jorgensen 2013; Goodhart and Ashworth 2012). Simply, monetary stimulus through a compression of the term premium may have a relatively smaller effect on investment than that provided through a lower expected path of future short-term rates. As shown in **Chart 3**, QE flattens the yield curve (rather than shifting it downward as the result of, for instance, conventional policy easing and forward guidance). With the term premium substantially compressed or even negative, firms might then be inclined to issue cheaper long-term bonds and, rather than investing the finances raised from issuing long-term bonds, use them to retire or buy back their more expensive outstanding short-term bonds. In other words, cheaper long-term interest rates may induce a change in financing behaviour without affecting investment behaviour.¹⁰ This implies that effectiveness through the lending channel becomes more limited the more the term premium is already compressed (Stein 2012).

⁸ This discussion includes the risks from “low for long,” such as (i) disincentives for governments, businesses and households to reduce their debt, thereby delaying necessary balance sheet adjustment, (ii) concerns about financial stability and (iii) asymmetric or distributional effects that benefit borrowers and punish savers (Reza, Santor and Suchanek 2015).

⁹ The Riksbank’s experience shows, however, that QE may lower not only bond yields but also yield differentials in relation to German bunds (De Rezende, Kjellberg and Tysklind 2015). Moreover, in an open economy, the effect of LSAPs may be felt more through the exchange rate, thus boosting the country’s economy through increased net trade (Reza, Santor and Suchanek 2015).

¹⁰ Some evidence of this can be seen in the data: a large fraction of the strong non-financial corporate bond issuance in 2012 was devoted to refinancing and not to new capital spending (Stein 2012).

Similarly, concerns about diminishing returns apply to the use of negative interest rates. Indeed, there is evidence that the effect of a reduction in interest rates in negative territory is more modest than a similar-sized cut that leaves rates in positive territory because of incomplete pass-through to deposit and lending rates (Bean 2013). Moreover, the mechanism through which monetary policy is transmitted may become weaker as the expected duration of negative interest rates increases because the incentive to switch to cash rises (Jackson 2015) and markets innovate to adapt (Witmer and Yang 2016). And finally, amid household deleveraging and uncertainty about the strength of global growth, the response of borrowing behaviour to a change in interest rates may be weaker.

Unconventional monetary policies have limits too

There are possible limits to UMPs because of their potential costs, and there is a point when their benefits may not outweigh their costs (Reza, Santor and Suchanek 2015).¹¹ UMPs can also hit operational limits. For large-scale asset purchases (LSAPs), significant purchases can impair market functioning by deteriorating liquidity in the market.¹² While an ample supply of public and private assets in the United States has allowed the Federal Reserve to purchase massive amounts of government debt and mortgage securities without seemingly coming close to such limits, other major central banks might actually be closer to their limits (Table 1). In the euro area, loans to corporations and households are generally extended through banks and thus the pool of assets the central bank can buy is smaller than it is in the United States. Simply, there may be an “effective quantitative bound” (EQB)—the point at which the costs outweigh the benefits of further UMPs and it is not worthwhile to continue with asset purchases. It is not our opinion, however, that the EQB has been reached in any of the central banks discussed in this article.

◀ *Unconventional policies also have limits in terms of operational bounds and efficacy*

In turn, the use of negative policy rates is limited by the ELB. Recent studies and international evidence suggest that the ELB is around -0.25 to -1.0 per cent depending on the country (Jackson 2015; Witmer and Yang 2016). If policy rates were to be lowered further or persist at exceptionally low levels over a longer time span, financial intermediation could become impaired as frictions in financial markets accumulate and the transmission of monetary policy could weaken so that, ultimately, the costs of using negative rates to stimulate the economy would outweigh the benefits.

Finally, there are some more general potential costs to consider. Some observers have argued that QE could undermine central bank independence and credibility if it were perceived to be aimed at monetizing large fiscal deficits through inflation. None of the respective central banks are currently suffering from this problem (Reza, Santor and Suchanek 2015). Others claim that QE may make it harder for central banks to raise rates when it becomes necessary.¹³ The experience until now has been encouraging: by paying interest on reserves, the Federal Reserve was able to raise rates despite its still-sizable balance sheet. Still others argue that QE in advanced economies has spilled over to emerging-market economies (EMEs) in the form of capital

¹¹ This is complicated by the fact that quantifying the costs and benefits of UMPs is challenging, and today's analytical frameworks might be underestimating the risks of monetary policy to financial stability (Fischer 2016).

¹² If the UK experience is a guide, central bank holdings of close to 40 per cent of the government bond market should not be expected to cause significant market impairment.

¹³ Indeed, central bank balance sheets have ballooned as a result of LSAP programs and are expected to take many years to return to their pre-crisis size and composition. If the central bank failed to adequately manage its balance sheet, this could lead to overly accommodative monetary conditions. Balance sheet risk management also raises issues of the extent to which, and the means by which, the central bank should be held accountable if losses were to occur.

Table 1: Central bank holdings of government debt as a share of total outstanding

As at 2015Q4		Total outstanding (in billions, domestic currency)	Central bank holdings	
			Amount (in billions, domestic currency)	As a share of total outstanding (in per cent)
United States	Marketable government debt held by the public (Treasuries) ^a	13,422	2,461	18
	Agency debt and mortgage-backed securities	6,470	1,780	28
United Kingdom	Government bonds denominated in pounds sterling (Gilts) ^a	1,220	385	32
Japan	Japanese government bonds	902,201	325,002	36
Euro area	Government debt securities denominated in euros	7,421	1,562 ^b	21
Sweden	Swedish nominal government debt securities denominated in Swedish krona	992	166	17

a. As at 2016Q1

b. National central bank holdings of general government debt plus ECB holdings under its asset purchase programs including the Covered bond purchase programmes 1-3, the Asset-backed securities purchase programme, the public sector purchase programme, and the Securities Markets Programme.

Sources: International Monetary Fund—International Financial Statistics, US Treasury, US Federal Reserve Board, UK Debt Management Office, Bank of England, Ministry of Finance Japan, Bank of Japan, European Central Bank, and Sveriges Riksbank

flows and upward pressure on asset prices and exchange rates (Lavigne, Sarker and Vasishtha 2014).¹⁴ The overall impact of QE on EMEs was likely positive, however, because of the beneficial trade and confidence effects stemming from stronger economic activity in the countries adopting QE.

The Interaction of Multiple Unconventional Monetary Policies

One topic that has received little attention so far is the effectiveness of using multiple UMPs simultaneously. Various measures can be mutually reinforcing when used in combination (Bank of Canada 2015; Poloz 2015). In the United States, for example, QE programs likely boosted the credibility, and hence effectiveness, of the forward guidance by conveying to financial market participants that the Federal Open Market Committee was determined to provide persistent and aggressive easing (Engen, Laubach and Reifschneider 2015). In a similar vein, LSAPs by the ECB likely mitigated possible credibility or commitment problems associated with providing forward guidance. De Graeve and Lindé (2015) argue that because LSAPs extend the duration and size of the central bank’s portfolio, starting to raise the policy rate early may result in capital losses. LSAPs can thus strengthen the credibility of announced guidance about low future rates because market participants believe that the central bank would want or need to avoid capital losses.

◀ *Large-scale asset purchases can strengthen the credibility of announced guidance about low future rates*

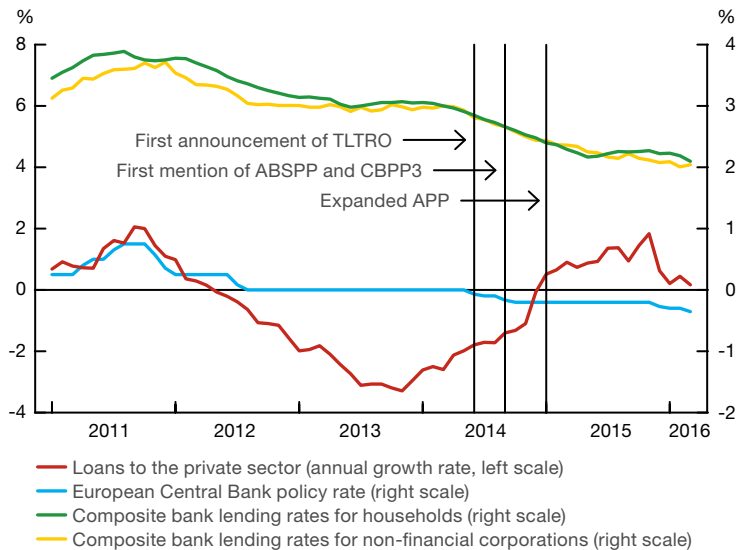
¹⁴ Glick and Leduc (2015) find that the US dollar depreciated by more in response to QE relative to conventional policy.

Technical or legal limits might even require the simultaneous implementation of such policies. The ECB’s decision to expand its asset-purchase program in late 2015 was facilitated by the simultaneous further cut of the interest rate on the deposit facility to -0.3 per cent: according to ECB’s own rules, bonds with yields lower than the deposit rate cannot be part of the QE scheme. This ruled out an important share of otherwise eligible bonds, such as German government debt securities at short- to medium-term maturities. In this environment, cutting the deposit rate further into negative territory likely widened the amount of permitted securities.¹⁵

Also, credit easing may enhance the transmission of the lower interest rates resulting from non-standard measures to all parts of the economy. A prominent example is the large-scale purchases of mortgage-backed securities by the US Federal Reserve (the Fed) as the liquidity in this market dried up in 2008. As the Fed stepped in, the resulting improvement in market functioning also enhanced the transmission of lower policy rates to other asset classes. In particular, there is evidence that corporate rates also declined and assets, such as stocks, rose during the program (Rosengren 2012).

Similarly, while measures in the euro area before June 2014 led to a substantial easing of banks’ funding conditions, little was transmitted to the borrowing costs faced by households and firms in many vulnerable member states. The credit-easing package introduced later that year appears to have significantly improved the pass-through of monetary policy measures to bank lending rates (Praet 2015; ECB 2016), the latter declining by more than market reference rates since the ECB’s credit-easing package was announced in June 2014 (Chart 5). Asset purchases were subsequently expanded, most recently to include corporate sector bonds with the aim of

Chart 5: Interaction of policy measures



Note: The indicator for the composite bank lending rates is calculated by aggregating short- and long-term rates using a 24-month moving average of new business volumes. TLTRO stands for targeted longer-term refinancing operations. ABSPP and CBPP3 denote two asset-backed securities purchase programs, i.e., the asset-backed securities purchase program and the third covered bond purchase program. APP stands for asset purchase program.

Sources: Haver Analytics and European Central Bank

Last observation: March 2016

¹⁵ Conversely, some observers argue that pushing yields below the new deposit rate again only perpetuates the ineligibility problem of some bonds as European markets price in another rate cut.

further strengthening the pass-through of the Eurosystem's asset purchases to the financing conditions of the real economy. This is yet another example of the complementarity of unconventional tools.

The simultaneous implementation of UMPs may pose important challenges, or, simply, the effects may not be cumulative. For example, instruments such as negative deposit rates and asset purchases may not be implemented together consistently (Noyer 2016): LSAPs lead banks to hold important excess reserves with the central bank. If negative interest rates are implemented simultaneously, banks need to pay interest on these reserves. As a result, banks might be encouraged to grant new loans or buy assets rather than holding excess reserves. But this extra liquidity in the financial system ultimately needs to be deposited on bank accounts as well. Unless banks impose negative rates on depositors, their margins will be squeezed. If they respond by increasing their credit margins or curtailing loans altogether, credit conditions would tighten and thereby dampen the effectiveness of monetary policy. Alternatively, if banks absorb the losses, this would weaken the banking system, which could, in the extreme, also impede proper monetary policy transmission.

Similarly, combining the introduction of negative rates with forward guidance might reduce the overall effectiveness of these policies. The use of negative interest rates in isolation may well be perceived to be temporary and thus not induce major changes in behaviour as agents choose to absorb any costs. In this case, strategies to avoid negative deposit rates, for example, would not be necessary or viable. But, if negative interest rates were implemented in combination with forward guidance, this clearly implies that policy rates will remain negative for a long time, inciting agents to search for options to circumvent or contain related costs rather quickly. To avoid paying interest rates on deposits, agents could rapidly invest in safe storage of cash. This would effectively increase the ELB and limit the power of the additional stimulus that negative rates can provide.

◀ *In some cases, the effects of simultaneous UMPs may not be cumulative or they may imply new challenges*

Exit Strategies

While the unwinding of UMPs is not imminent in most advanced economies, policy normalization has begun in the United States. To keep inflation expectations well anchored, central bank exit strategies should be specified before they are implemented. Exit strategies will necessarily depend on country-specific circumstances, including decisions on the sequencing of tightening when various measures are in place.

With respect to QE, central banks may simply allow purchased assets to mature, which would result in a gradual normalization of the size of its balance sheet over several years (Carpenter et al. 2015).¹⁶ Importantly, the ability of central banks to pay interest on reserves allows them to raise policy rates despite having large balance sheets and thus provides additional flexibility in formulating exit strategies (Kozicki, Santor and Suchanek 2011).¹⁷ In turn, the exit from negative interest rates should, in theory, be similar to monetary

◀ *Central bank exit strategies should be specified before they are implemented to help keep inflation expectations well anchored*

¹⁶ In the case of the US Federal Reserve, a decision to not replace decreased mortgage-backed securities (MBS) holdings resulting from prepayments would nevertheless be insufficient (in the absence of outright sales) to return to a pre-crisis composition of its balance sheet. A scenario including outright sales of MBS is, however, rather unlikely at this point (Carpenter et al. 2015).

¹⁷ In the case of the US Federal Reserve, for instance, the Federal Open Market Committee announced it would cease or begin phasing out reinvestments of central bank holdings acquired under its LSAP programs only *after* it begins increasing the target range for the federal funds rate. Yet, while communication about the intended sequence, pace and timing of exit is important to guide market participants, central banks should remain flexible to adjust their approach to policy normalization in light of economic and financial developments.

policy tightening from low but positive rates. The central banks may make use of changes to the corridor, allowing for additional flexibility (Kozicki, Santor and Suchanek 2011).

Several challenges arise when considering the exit from unconventional monetary policy. First, policy-makers need to allow for the possibility that concurrently raising policy rates and draining reserves might alter the usual transmission mechanism. A typical policy rate increase, for example, could prove less contractionary than usual in the presence of substantial excess liquidity in light of expanded balance sheets. Second, if the central bank needs to sell assets, it could incur losses. To preserve policy credibility and independence to ensure the effectiveness of future policy, it needs to clearly state accountability in the context of the exit. In the case of the Bank of England, the British government provides an indemnity to cover any losses arising from the asset purchase facility. The US Federal Reserve, meanwhile, would stop remittances to the US Treasury should it incur losses and would need to offset losses with future remittances. While such losses could draw undue attention to the central bank, there is no evidence that they would impair the ability of the central bank to achieve its mandate.

Conclusion

The international experience of UMPs has shown that central banks have not run out of solutions when the policy rate is close to the ELB. Given the limits and potential costs of such measures, however, rather than being “perfect” substitutes for conventional monetary policy, they appear to be an “adequate” tool at the disposal of central banks.

◀ *Central banks have not run out of solutions when the policy rate is close to the effective lower bound*

The adverse effects of these measures so far appear small, but making these measures permanent, or even using them on a larger scale, will likely amplify the potential for negative externalities. Their use thus requires a solid understanding of unintended consequences and limits so that central banks can seek, to the extent possible, to minimize them or raise awareness. In this way, mitigating or corrective action can be taken by other relevant authorities (Draghi 2015). Indeed, the simultaneous implementation of macro-prudential regulation can help to mitigate or even offset financial risks and distortions resulting from a low-for-long environment.¹⁸

Central banks, moreover, need to continue adapting the modelling and analytical frameworks they use to analyze the challenges of modern central banking tools. As central banks are faced with questions on the simultaneous implementation of UMPs, they need to carefully evaluate and anticipate the interaction of such measures. While researchers have tended to map the estimated impact of UMPs into an equivalent conventional interest rate cut in order to evaluate the impact on economic growth and inflation, the assessment of several simultaneous measures is likely more complicated. A simple addition of the effects into a single interest rate estimate risks ignoring any interdependencies of such measures and thus needs to be qualitatively assessed or modified. In addition, models need to be adapted to account for non-linearities of UMPs given the evidence of decreasing returns to scale for both QE and negative interest rates discussed above.

Sound communication in implementing extraordinary tools is primordial to ensure that market participants and the public understand the purpose as well as important aspects of their intended transmission. This may be

¹⁸ In addition, policy-makers need to be aware the UMPs cannot offset structural sources of weakness, compensate for a lack of fiscal stimulus or offset the effects of fiscal consolidation.

particularly challenging when innovative tools such as negative interest rates are introduced. Central banks therefore need to clearly communicate their decisions and repeatedly relate them to their mandated objectives (Santor and Suchanek 2013).

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