Inflation targeting in the light of lessons from the financial crisis*

*István Ábel – Orsolya Csortos – Kristóf Lehmann –
Annamária Madarász – and Zoltán Szalai*

*This paper surveys the changes triggered by the financial crisis and the theoretical
and practical options for the renewal of the inflation targeting framework. While a
comprehensive overview would be impossible to provide, it seeks to present the changes
in the monetary strategy of Magyar Nemzeti Bank against this wider context. First, it
describes in brief the inflation targeting framework, its key elements and the principles of
how it operates in practice. The paper then explains criticisms of the inflation targeting
framework in light of the financial crisis and the practical, strategic and theoretical
innovations that these have led to. On this note, there follows a discussion of the options
most widely adopted as solutions to the challenges and what proposals were made but
never used. Finally, the paper provides an overview of the practical lessons learnt in recent
years regarding these instruments in advanced and emerging economies. International
experience demonstrates that inflation targeting continues to be one of the best practices
of monetary policy and that its transformation during the crisis reflects heightened interest
in considerations (e.g. financial stability) beyond the primary goal of the inflation target.
Rather than including greater flexibility in its goals, the changes to the earlier framework
of inflation targeting resulted in a transformed and augmented toolkit and institutional
system that may remain an integral part of monetary policy and central bank practice. To
prepare this survey for information purposes, the authors relied on working documents
produced by the Monetary Strategy Department at the Monetary Policy and Financial
Market Analysis Directorate of Magyar Nemzeti Bank.[1]*

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1 Introduction

The purpose of this paper is to give an overview of key changes, triggered by the crisis, in the strategy and toolkit of the inflation targeting (IT) monetary policy framework. This study describes the challenges and dilemmas caused or exacerbated by the crisis, which currently represent the greatest difficulties for central banks using inflation targeting or similar frameworks. Felcser et al. (2014) discuss in detail the generic features of the inflation targeting framework (e.g. the basic components of strategy, the importance of transparency and accountability), its theoretical background (e.g. the role of interest rate rules), and the aspects of its flexibility.

Inflation targeting frameworks are used in a number of advanced and emerging economies all over the world. They owe their popularity to their relative simplicity and the positive results achieved by the central banks that pioneered them. Abo-Zaid and Tuzemen (2012) have shown that inflation targeting is a favourable framework for advanced and emerging economies alike. This is demonstrated by the fact that rates of inflation are considerably lower and more stable in emerging economies using IT and that, compared to the pre-IT period, the rate of economic growth is higher in advanced and emerging economies than in non-IT countries.[2]

The financial crisis did not, however, leave the monetary policy framework intact, as it has highlighted the fact that merely creating price stability does not secure macroeconomic and financial stability. The crisis has resulted in changes to institutional structures as well as the toolkits employed.

Several central banks turned to unconventional instruments to manage the serious consequences of the financial crisis once they ran out of opportunities to cut interest rates (Shirai, 2014). When the conventional tools (e.g. the interest rate policy) were exhausted, new monetary policy instruments and other measures to shape expectations were needed in order to implement monetary easing by what is called "quantitative and qualitative easing". These tools included changes in bond purchasing and the communication practices of the central banks of advanced economies, but the overall picture is highly varied and complex, reflecting different national idiosyncrasies, but offering several lessons for emerging economies as well.

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2 Felcser et al. (2014) discuss this in detail.

2 The system of inflation targeting

Inflation targeting is a monetary policy framework encompassing the intentions and behaviours of a central bank aiming for price stability. One driver behind the inflation targeting systems introduced in the 1990s was the understanding that the **maintenance of price stability** was a precondition for the efficient and stable operation of the economy and for achieving maximum social welfare. When first adopted, the inflation targeting framework was initially called "direct inflation targeting" (DIT), and it was predicated on the idea that while creating price stability had been a key objective for monetary policy in the past, intermediate target variables such as the exchange rate or monetary aggregates had proven unsuccessful in reducing inflation to the required level, meaning that the choice of nominal GDP as an intermediate target did not appear to be a relevant alternative (Krzak and Ettl, 1999). In the inflation targeting framework, the inflation forecast serves as the intermediary target, providing guidance for the final target (inflation) and also capturing the changes of as many factors outside the central bank's scope as possible, even before they can actually influence the final target. A key communication tool in the system is the (usually quarterly) inflation report, which provides in-depth analyses of inflation and real economy trends, as well as the macroeconomic forecasts of the central bank to underpin decision-making, help explain the decisions of the central bank to the wider public, and shape expectations.

2.1 The theoretical considerations of inflation targeting

The main building blocks of the inflation targeting framework are the primacy of the price stability mandate, the designation of a numerical inflation target, the independence of the central bank, the transparency of central bank operations and an environment of accountability. Of the above, the key components of inflation targeting are the **primacy of price stability** (none of the other targets should hinder the achievement of price stability) and the **publicly announced, numerical inflation target**, which also serves as the nominal anchor. Price stability is generally set at a low – but not zero – rate of inflation, as deflation and high inflation both have negative effects on the real economy. Besides price stability, it also helps successful adaptation if the implementation of price changes does not deplete resources unnecessarily. This also simplifies adaptation to changes in demand, as companies are better able to consider the unique supply-and-demand characteristics of their operations and inflation-related uncertainties do not prevent them from predicting the consequences of their decisions. In an environment where inflation is stable and low, they will be more confident to conclude long-term agreements, which will reduce

the uncertainty of the business environment, drive down long-term interest rates and incentivise investment. As another positive side effect, government debt can be financed at better terms if the excess return expected by investors to offset inflation uncertainty is lower. Lower interest rates on loans may cause companies and households to shift their borrowing to the domestic currency, thus reducing the risk of financial stability originating from exchange rate risk on foreign currency loans and deals.

Acting as a nominal anchor, a declared numerical inflation target can anchor the expectations of economic agents for future inflation. If the nominal anchor is credible and the economic agents are therefore confident that the monetary authority will deliver on its target, they will then set their inflation expectations accordingly. The more confident economic agents are that the central bank will in fact provide price stability, the more likely they are to formulate their price-setting and wage-setting decisions accordingly. This then makes it much simpler for the central bank to achieve and maintain the target, with far fewer sacrifices in the real economy.

The independence of the central bank, the transparency of its operations, and its accountability represent the basis for the efficient functioning of any inflation targeting system. Therefore, it is vital for the **central bank** to operate in a way that is **credible**, with forward-looking measures to achieve the target, as this allows the inflation target to serve as a guidance for households and corporations in their price and wage setting. The central bank can achieve this effect via a number of transmission channels and thus ultimately deliver on its primary mandate of providing price stability.

Monetary transmission is a complex, multi-phase mechanism that central banks use to shape output and inflation by changing the nominal interest rate. Monetary transmission has several channels through which monetary policy measures can influence demand in the real economy and the consumer price index. The interest rate channel facilitates that an increase in the nominal interest rate may lead to changes in consumption and the investment decisions of households and corporations, leading to a contraction in domestic demand and an alleviation of demand-side inflationary pressure (intertemporal substitution). Through the exchange rate channel, a higher central bank base rate will make instruments denominated in the domestic currency more attractive, causing an appreciation of the currency, a fall in import prices, and lower inflation (imported inflation, exchange rate pass-through). In addition, the change of exchange rate affects the real economy by means of two conflicting effects on inflation. First, a stronger exchange rate may impair the competitiveness of resident corporations, which in turn diminishes economic activity and reduces inflation (rechannelling of spending). Second, if domestic economic agents have debt denominated in foreign currency, a stronger exchange rate will boost the incomes available and thus drive up inflation (balance sheet channel). The expectations channel captures the forward-looking nature of monetary policy. This means that monetary policy measures exert their influence not only through developments

in a given period, but also by shaping economic agents' expectations. Also, economic agents make their decisions mindful not only of current economic trends, but also future projections for such; therefore, if economic agents consider the central bank to be credible, they will expect inflation to approximate the inflation target in the medium term, even if the current rate of inflation differs from the target. This allows inflation to return to the target without interference from the central bank (Krusper and Szilágyi, 2013).

2.2 Inflation targeting in practice

Inflation targeting is always **flexible** in practice, as the central bank will focus on more than solely shaping inflation in its inflation targeting framework (Svensson, 2008). The primacy of price stability does not imply that inflation should be at the target at all times; even central banks following an inflation targeting practice allow inflation to deviate from the announced target from time to time. Inflation targeting is a flexible framework that takes into account factors beyond price stability, such as those of the real economy or even financial stability, and in fact lasting price stability is achieved in this way. Its objective is to mitigate volatility in the real economy, which suggests that even central banks with a regime of inflation targeting are unwilling to cause excessive sacrifices in the real economy to achieve their primary objective. One way of giving greater weight to real economic criteria is for the central bank to respond to medium-term changes in inflation rather than current processes or one-off shocks that do not affect the underlying processes (Krusper and Szilágyi, 2013).

It follows from the above that a key characteristic of inflation targeting is that it is **forward-looking**. Decision-makers respond to expected future trends rather than the latest data published. One reason for this lies in the fact that monetary policy has a delayed effect on key macroeconomic variables and is typically strongest after three or four quarters. Another reason lies in the assumption that economic agents adopt their decisions in a forward-looking manner (i.e. on the basis of their expectations for the future). If inflation expectations are anchored, then changing the interest rate to offset temporary inflation shocks would involve real economy sacrifices that are unnecessary to maintain price stability. As a result, inflation targeting central banks with sufficient credibility may choose not to respond to temporary price shocks (i.e. disregarding the impacts of higher indirect taxes or one-off energy price shocks that drive up prices). In addition, however, they will pay special attention to potential indirect "second-round effects" that may occur via expectations or wage setting.

3 Potential monetary policy responses to the crisis

In the period of Great Moderation preceding the crisis, relatively long-lasting, stable growth with price stability characterised advanced and emerging economies alike. Accordingly, the pre-crisis consensus held that inflation targeting offered monetary policy the right framework for achieving price stability and, in a wider sense, sustainable prosperity. Nevertheless, in this stable macroeconomic environment of low inflation, there were increasingly frequent occurrences of symptoms of macro-level financial instability, which ultimately contributed to the outbreak of the financial crisis. Through recognition of this fact, a new consensus has emerged in recent years: namely, that the inflation targeting of that period was not suitable for creating long-term macroeconomic stability. Apart from strategic mistakes, there were implementational errors – especially regulatory and supervisory errors – that led to the financial crisis. These included the use of inappropriate financial market stimuli or information problems,[3] along with certain special circumstances (such as the US mortgage market problem) (Svensson, 2010).

Matters of microprudential regulation, macro-level financial stability and monetary policy strategy tended to be treated separately prior to the crisis. The crisis has demonstrated that these branches of economic policy must be treated jointly, with due consideration of their mutual interactions at the theoretical and modelling level (see Box 1), as well as in practice (i.e. joint consideration of strategic and institutional matters) (Borio, 2014). All this has suggested that a reform of inflation targeting approaches and toolkits was imperative.

Box 1

Financial imbalances, financial cycles and estimation of potential output in light of the financial crisis

It follows from the above that a new approach in modelling is required in order to incorporate financial considerations in monetary strategy, which should explicitly include the relation between the cyclical movements of financial variables and cyclical shifts in the real sector.

The starting point for output-gap estimation accepted in the literature and in practice rested on a macroeconomic analytical framework in which financial variables (e.g. credit aggregates) and the financial sector in the wider sense did not play a substantial role. Accordingly, the empirical output-gap estimates were intended to capture the cyclical position of the real sector with the help of real variables. The simplest univariate approaches took the output time series as their basis to establish whether the output gap was

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3 For instance, the risks of complex investment vehicles were inappropriately gauged and the level of systemic risk was underestimated.

positive or negative, compared to its own trend. If the output gap is positive, then higher inflation pressures may be expected; if negative, then lower ones may be expected. Although the method is simple and transparent, it has a major disadvantage, as it is unable to provide a real-time estimate of the most important question concerning turning points: it is able to signal changes in output direction only with a delay, meaning that decision-makers may rely on a wrong assessment of the situation for extended periods. Subsequent estimates based on new data points then considerably revise the cyclical position of the economy and potential output as well.

In order to address this problem, referred to as "endpoint uncertainty", further variables were added to the univariate estimations, which carry information about, and are indeed in a causal or functional relation with, the cyclical position of output (structural estimates). Underlying this was the desire for facilitating the timely forecasting of turning points and a more accurate real-time estimation of the economy's cyclical position. One of these widely used relationships is the Phillips curve. It reflects the idea that as the labour market tightens (i.e. unemployment falls) or, in a wider sense, as capacity utilisation increases, inflationary pressure will increase gradually and price stability will eventually be at risk.

Structural estimates that also capture other relationships are more suitable for monetary policy assessments than univariate ones. The crisis has, however, thrown light on other related problems, as the Phillips curve has also proven to be an unstable relation, creating difficulties in estimating NAIRU (non-accelerating inflation rate of unemployment). The instability of these additional structural relationships highlights fundamental issues rather than mere technical or measurement problems. This suggests that modern economies have gone through structural changes to the extent that in a boom period, the main issue is not merely inflation, but financial instability and the sustainability of financing. Accordingly, changes in inflation no longer provide sufficient information regarding the sustainable rate of output growth: a path of growth may prove unsustainable from a financial equilibrium perspective, even if inflation is stable.

BIS economists (Borio et al., 2013a, 2013b and 2014) have therefore introduced the concept of a "finance-neutral" output gap, as opposed to the traditional ("inflation-neutral") output gap. In conventional estimation practice, the output gap closes when the requirement for price stability is reached (i.e. forward-looking inflation is in line with the inflation target). The new gap indicator is analogous with this in the sense that it compares the actual situation in the economy to a sustainable output path, but it also adds that indebtedness and property price changes should not lead to overheating and then suddenly to a dangerous degree of overcooling. Observable variables are used to gauge the condition of the real economy, such as unemployment and other capacity utilisation indicators, which detect overheating not only when they measure an upward pressure on prices. In other words, the estimation is not reliant on the Phillips curve, which has proven unstable. There is a key difference between the inflation-neutral and the finance-neutral output gap. If inflation-neutral output-gap estimation is used, financial imbalances may build up, even if there is price stability. The finance-neutral output gap seeks to control for this factor as well, as it relies both on inflation processes and financial variables to estimate the output gap and overheating in the economy. The new output gap is estimated in a single step, resulting in a more transparent and smaller model, which requires less revision in light of new data. This provides economic policy decision-makers with more reliable and current information.

The real economic and deflation risks of the protracted recession caused by the crisis have made it necessary to use new instruments. Consumption and investment demand has contracted in the wake of the crisis, and inflation has retrenched (with deflationary risks appearing in certain cases); production has also fallen. All of this has justified cutting interest rates quickly. In advanced economies, central banks swiftly cut interest rates close to zero, but even so they were unable to prevent recession and an undershooting of the inflation target. Eventually there remained no additional scope for further cutting of real rates of interest. As long as an instrument like cash is present, which provides at least zero nominal return, nominal interest rates would not fall below zero significantly and for extended periods. This zero lower bound (ZLB) of nominal interest rates thus became an obstacle to continued use of the conventional toolkit to provide the monetary easing still needed by the economy. In response to these challenges, the central banks of advanced economies started on a course of intense unconventional monetary easing.
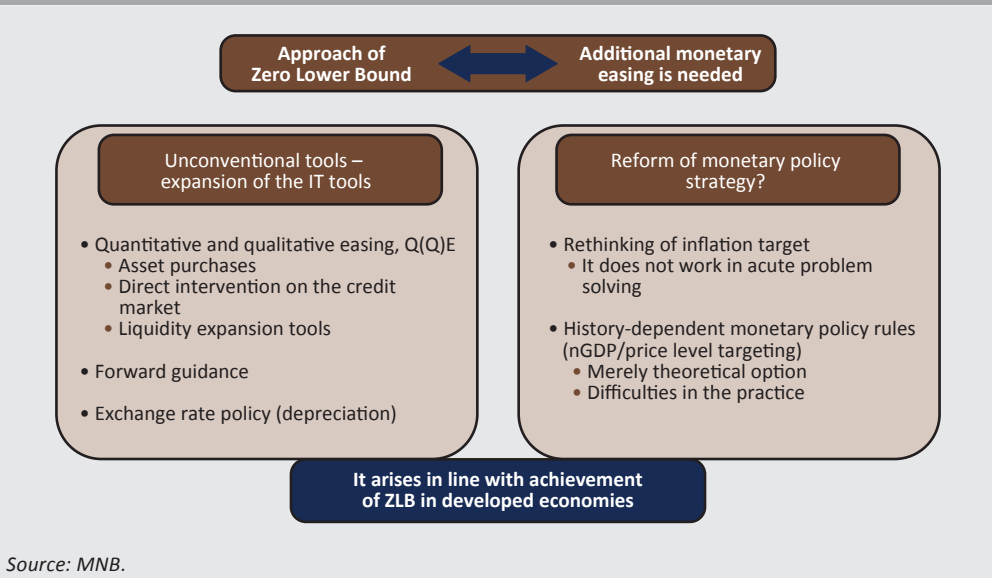
Reaching the ZLB thus represents a challenge for monetary policy, as its conventional toolkit is exhausted and it is forced to turn to new, unconventional methods to boost the economy. The liquidity trap, a problem closely tied with the zero lower bound, entails risks additional to the central bank's inability to prevent recessions and avoid undershooting the inflation target. A liquidity trap occurs typically at the zero nominal interest rate, when the markets do not expect further rate cuts (or when further nominal rate cuts are no longer even possible) and, consequently, demand for cash increases and demand for long-term bonds disappears. Economic agents may incorporate the inflation rate into their expectations and, in the event of sufficiently great shocks, deflation expectations may also develop. As soon as inflation expectations decouple from the central bank's inflation target, the real rate of interest starts to rise and move yet further from the level that the economy would need in order to stabilise, which further aggravates the crisis. This exerts further downward pressure on prices and then feeds through into an ever-deepening deflationary spiral,[4] where conventional monetary policy instruments are ineffective to facilitate recovery.[5] The following chart outlines the options for tackling the challenges posed by the zero lower bound; the main points are discussed in detail in later sections.

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4 Ábel, Lehmann, Motyovszki, and Szalai (2014)

5 In such a case, unconventional instruments practically replace and substitute for the conventional tools that have proven inefficient. If, however, low liquidity on the financial markets or unjustifiably high spreads jeopardise monetary transmission, the unconventional instruments may involve restoring transmission to supplement monetary policy, so that their use may prove justified even when the rate of interest is above zero (Krekó et al., 2012).

Chart 1
Possible solutions for challenges represented by the zero lower bound and acute problems caused by the crisis

Approach of Zero Lower Bound ⟷ Additional monetary easing is needed

Unconventional tools – expansion of the IT tools

- Quantitative and qualitative easing, Q(Q)E
  - Asset purchases
  - Direct intervention on the credit market
  - Liquidity expansion tools
- Forward guidance
- Exchange rate policy (depreciation)

Reform of monetary policy strategy?

- Rethinking of inflation target
  - It does not work in acute problem solving
- History-dependent monetary policy rules (nGDP/price level targeting)
  - Merely theoretical option
  - Difficulties in the practice

It arises in line with achievement of ZLB in developed economies

Source: MNB.

3.1 Quantitative and qualitative easing (QQE), credit market interventions and liquidity expansion

By entering the securities market in longer maturities, the central bank is able to shape long-term returns by *direct intervention*. In **quantitative easing**, the central bank boosts its balance sheet and buys the right instruments to influence market yields directly. It is important to emphasise that the growth of the central bank's balance sheet – and thus of the monetary base –would not provide further monetary easing in this case.[6] The result of asset purchases is a decline in the market yields of the instruments in question. In a liquidity trap, the increase in liquidity via asset purchases does not represent further easing that would lead to credit expansion. The surplus liquidity is added to the reserves placed with the central banks. In such a case, banks accumulate a surplus quantity of money, which resembles the characteristic scenario of a liquidity trap in which money ends up with various private economic agents without generating demand or supply.

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6 In the traditional theory of money, money and credit expansion results from the increase of the central bank's balance sheet (i.e. the monetary base), and this is how easing boosts the economy, assuming that the money multiplier does not collapse. In contrast to this, quantitative easing does not necessarily lead to money creation, since it translates into deposits (reserves) at the central bank, while the money multiplier shrinks. For details, see McLeay, Radla and Thomas (2014).

Direct intervention on the credit markets operates on a principle similar to quantitative easing, but is more specifically targeted on lending. It involves the central banks purchasing corporate securities and mortgage bonds, or lending directly to financial institutions. The central bank thus establishes a direct link to the non-financial private sector and assumes some of its credit risk. The objective of these interventions is to support the credit markets, to reduce the risk and liquidity spreads on the credit markets, and ultimately to improve the credit conditions for the private sector. In a recessionary environment, the small- and medium-sized enterprise (SME) sector faces major financing difficulties, which cannot be managed substantively by relying only on direct purchases of corporate securities; the solution lies either in supporting asset-backed securities (ABS) incorporating SME loans or by acting directly via government agencies.

Central banks are able to supply liquidity to the financial system in normal periods as well, but after the outbreak of the crisis the **provision of liquidity** was required in considerably higher volumes and different structures. The purpose of the new liquidity-providing instruments is to help refinance banks when their funding costs are much higher than the policy rate, if a large proportion of assets in banks' balance sheets becomes illiquid, or perhaps if the availability of foreign currency liquidity is limited on the market. For this reason, these instruments will be effective only if the banks are grappling primarily with liquidity issues rather than the constraints imposed by their capital positions, or if bank lending contracts due to liquidity reasons rather than increased risk aversion.

3.2 Forward guidance[7]

While transparent central bank operations and clear communication (regarding monetary policy target variables, the background of decisions, underlying argumentations, and expected macroeconomic trends) became increasingly widespread even before the onset of the crisis at the central banks using IT best practices, the role of forward guidance gained prominence after the zero lower bound was reached. In normal times, central bank communication allows economic agents to deduce from the previous decisions and systematic behaviour of the central bank how it would respond to various economic processes and shocks in the future. However, if uncertainties surrounding the economic outlook intensify, the importance of communicating the future direction of monetary policy increases as the economic situation becomes more unpredictable and the zero lower bound restricts the manoeuvrability for monetary policy.

Several central banks turned to forward guidance to shape the long end of the yield curve during the crisis. Managing expectations is an important transmission channel, since

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7 Csortos, Lehmann and Szalai (2014) discuss the theoretical considerations underlying forward guidance (e.g. forecast-based versus commitment-based guidance), its transmission mechanism and practical experiences.

consumption and capital investment decisions tend to depend on longer-term (real) interest rates. It is less the current level of the base rate, but rather expectations for the path of the base rate and the medium-term inflation outlook that play a dominant role in determining longer-term yields.

Most analysts and economic policy-makers have welcomed forward guidance as a new communication instrument of central banks. The interpretations discussed above hold that the main objective for a central bank that has reached the zero nominal lower interest rate bound is to reduce expected real interest rates by raising inflation expectations to near the target and thus to stimulate the economy through the expectations channel. Another view holds that the expected real interest rate cannot be lowered and current expenditure thereby stimulated by raising inflation expectations. Forward guidance can, however, keep increases in long-term nominal yields under control and prevent real interest rates from suddenly rising, which would lead to an overreaction in bond markets. This approach highlights the role of forward guidance in mitigating bond market uncertainties linked to the beginning of the tightening cycle and in preventing the panic-driven selling of bonds (for further details, see Csortos, Lehmann and Szalai, 2014).

Csortos, Lehmann and Szalai (2014) demonstrate that forward guidance was widely adopted as a communication tool during the crisis and has become an integral part of the monetary policy toolkit. Although the strategic importance of this communication tool may decrease following the crisis and as the zero lower bound loses its relevance, the experience of recent years shows that this tool has improved the efficiency of monetary policy.

3.3 Rethinking (raising) the inflation target

The crisis has revealed that the economy may be subject to major disinflationary shocks. This raises the prospect of monetary policy setting a higher inflation target to allow it more room for manoeuvrability in the event of a future round of new shocks and to reduce the likelihood and costs of a liquidity trap occurring. There are, however, numerous arguments against raising the inflation target. While inflating real debt away may appear attractive, it entails a decrease in real interest rates, real wages and real property prices, which would necessitate another costly macroeconomic adjustment.

In the long run, it would incur considerable costs as a result of a permanently higher and more volatile inflation. One of the most important problems is that higher inflation may change the structure of the economy, magnify inflationary shocks and reduce the efficiency of monetary policy. Furthermore, even if the central bank considers raising the inflation target only temporarily, there is great risk in that the credibility of the central bank and its role as a long-term anchor will be questioned, with potential repercussions for central

bank decision-making going forward. Thus, this type of solution does not appear suitable for managing an acute problem; none of the central banks have changed their frameworks in this way.

3.4 History-dependent strategies[8]

In theory, history-dependent monetary policy strategies going beyond the framework of inflation targeting may be suitable for managing a liquidity trap (although this is a subject of lively debate), but its practical implementation would certainly be difficult and costly. It should be noted that rather than their differences in considering real economic criteria, the main divergence between inflation targeting and nominal GDP-targeting systems lies in the fact that nominal GDP targeting shoots at a level variable; therefore, so-called "history dependence"[9] applies to it.

In a theoretical model framework, temporarily increasing inflation expectations may be desirable if the zero lower bound is near, as it would offer a feasible means for reducing the real interest rate. Shaping expectations is possible, in theory, by using a history-dependent monetary policy target framework (price-level targeting, nominal GDP targeting) that may imply temporarily higher inflation. These approaches may guarantee long-term price stability even as another nominal variable (nominal GDP, price level) than inflation acts as nominal anchor. Thus, in this sense these solutions go beyond the framework of inflation targeting.

Nevertheless, these history-dependent political strategies raise countless practical problems that raise questions about the benefits of their implementation. Most of their advantages apply only if forward-looking expectations are assumed, and they also represent a concept that is hard to communicate and understand. And if the targets are not understood well, the inflation expectations may become entrenched instead of rising temporarily. Selecting the starting point for the target path also causes a problem, and wrong estimates of potential output level may result in permanently higher inflation if nominal GDP targeting is followed. A further disadvantage of another history-dependent strategy, price-level targeting, is that one-off price shocks cannot be disregarded, which would make the monetary policy more expansionary in the case of disinflationary or deflationary shocks and tighter in the case of inflationary shocks than under inflation

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8   See Csermely and Tóth (2013) for details.

9   In contrast to inflation targeting, history-dependent monetary policy rules are not forward-looking; instead, historic changes in the target variable also influence interest rate policy, which may have an influence on shaping inflation expectations. History dependence is achieved normally by selecting the level, rather than the rate of growth, of a nominal variable as the intermediary target (nominal anchor) of monetary policy; in this sense, these solutions point beyond the framework of inflation targeting (Felcser et al., 2014).

targeting. In the context of all of the above, history-dependent strategies have been raised merely as theoretical options.

4 Changes in the IT frameworks of advanced and emerging economies after the crisis

Although the financial crisis posed countless challenges for the various inflation targeting regimes, some studies have pointed out that the consequences of a crisis are less harsh in countries operating under an IT framework. For example, Mollick, Cabral and Carnerio (2011), who analysed figures only prior to the global financial crisis, incorporated in their sample a number of regional and national crises. They found that countries that followed inflation targeting recovered faster after a crisis. This result is presumably related to the fact that inflation targeting can be implemented only if the institutions safeguarding economic stability are present and the financial markets are sufficiently developed, which, by itself, increases the resilience of an economy against external shocks.

4.1 Advanced economies

During the crisis, the central banks of advanced economies actively used the unconventional instruments described in the previous section. Every central bank of global importance or with a reputation for best practice used schemes of liquidity provision against collateral, often for long maturities or in foreign currency. Fewer central banks used quantitative easing and credit-market interventions. Yet none of the central banks of advanced economies considered raising the inflation target or stopping inflation targeting and opting for a different variable as their target (e.g. targeting the price level or nominal GDP) (Table 1).

Table 1

Monetary policy instruments used in advanced economies after the crisis

Country	Forward guidance	Unconventional tools			Raising inflation target	Other target
		Quantitative easing	Direct intervention on the credit market	Liquidity expansion		
EZ	X	X	X	X		
J	X	X	X	X		
US	X	X	X	X		
AU	X			X		
CA	X			X		
NO	X			X		
NZ	X			X		
SE	X			X		
UK	X	X	X	X		

Note: EZ: Eurozone, J: Japan, US: United States, AU: Australia, CA: Canada, NO: Norway, NZ: New Zealand, SE: Sweden, UK: United Kingdom

In January 2012, the Federal Reserve announced an explicit inflation target of 2 per cent, whereas the Bank of Japan, albeit with weaker commitment, also took a step towards IT by setting a medium- or long-term objective of 2 per cent or below. In spite of having an explicit inflation target, the European Central Bank does not follow an inflation targeting monetary policy, but its instruments and the way they are employed – as well as its strategy and the way it is communicated – make the ECB one of the globally important central banks most committed to price stability. The bottom half of the table contains the countries with inflation targeting central banks using best practices.

To summarise, the toolkit of central banks has changed, the objectives have shifted as a result of the crisis, and focus has been redirected on financial stability and certain real economic indicators. It should be remembered that increased emphasis on certain real economic variables has been suggested merely as a supplementary component of forward guidance and did not involve changing the target variable. Experience from the advanced economies has demonstrated the ability of flexible inflation targeting frameworks to rise to the challenges posed by the zero lower bound; therefore, flexible inflation targeting should continue to be considered as a monetary policy best practice. This is also evidenced by the fact that globally important central banks (such as the Federal Reserve) have tended to shift towards using the inflation targeting framework. Accordingly, instead of a more flexible target system, the renewal of the earlier framework of inflation targeting means having an expanded toolkit to help respond to challenges.

Given the large number and complex scope of the monetary policy instruments employed by the advanced economies in the crisis, they have been summarised in a table and the factors motivating their use have not been described in detail. It should be noted that these instruments have predominantly been responses to the challenges posed by the zero lower bound in the advanced economies, whereas different factors have led to the need for reforming the inflation targeting toolkit and employing further monetary policy instruments in emerging countries such as Hungary.

4.2 Emerging economies

4.2.1 Impact of the financial crisis on monetary policy in the emerging economies

The unprecedented monetary easing by the central banks of advanced economies significantly reduced the yields available on advanced markets, which also had a considerable impact on the emerging markets. The search for yields resulted in considerable capital inflows into these countries, as investors shifted their savings from the advanced countries to these markets in the hope of higher returns. This buoyed the currencies of the emerging economies and reduced their financing costs. In some countries, the high capital inflows even raised certain financial stability concerns regarding potential macroeconomic imbalances, overheating banking systems or a financial bubble, which some attempted to offset with capital constraints. Elsewhere, increased global liquidity and risk appetite, as well as resulting lower risk premiums, allowed for a more expansionist monetary policy in support of recovery from the crisis than would have been possible otherwise.

Emerging countries typically chose to satisfy some of their financing demand from foreign currency (this is referred to as the "original sin" problem). Whereas currency exposure may not be high on the macroeconomic level (as currency liabilities are coupled with some economic agents' currency assets), it may be high at the level of the individual economic agent. If households and the corporate sector both have high currency exposures, this will have an impact on monetary transmission.[10] Furthermore, the increased focus on financial stability criteria may constrain the central bank's manoeuvrability.

Since the crisis, several emerging central banks have reviewed their assumptions regarding the role that financial stability plays in addition to price stability, and thus the role that

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10 Foreign currency debt diminishes the effectiveness of the exchange rate channel of monetary transmission, which is the most important channel of emerging, typically small, open economies, since a positive and a negative impact occur simultaneously. See the previous section.

macroprudential policy has in addition to monetary policy. As a result, the view is becoming more prevalent that maintaining financial stability is essential for long-term price stability and the effectiveness of monetary policy actions (Billi and Vredin, 2014). Several central banks have added macroprudential regulation to their responsibility and toolkit, and financial stability was set as the second important objective of monetary policy besides the primary goal of achieving and maintaining price stability.

The following describes the extent of the various responses to the crisis discussed in the previous section, as well as the forms in which they have appeared in the practice of central banks in certain emerging countries that use, or are shifting to, inflation targeting.

4.2.2 Practices of central banks in emerging countries after the crisis

The emerging countries analysed also applied certain unconventional instruments, but they did so under conditions and in ways different from the advanced economies (Table 2).

Table 2							
Monetary policy instruments used by emerging economies after the crisis							
		Unconventional tools					
Country	**Forward guidance**	**Quanti-tative easing**	**Direct in-tervention on the cre-dit market**	**Liquidity expansion**	**Raising inflation target**	**Other target**	**Other measures**
CL	X			X			
CZ	X			X			X
HU	X	X		X			X
PL	X			X			
RO				X	↓		
RU	X			X	↓		X
TU	X			X	X		
Note: CL: Chile, CZ: Czech Republic, HU: Hungary, PL: Poland, RO: Romania, RU: Russia, TU: Turkey.							

All the countries analysed except Romania used some sort of **forward guidance**, but less of an Odyssean type than the central banks in advanced countries. The Czech central bank committed itself to a low interest rate and declared that it would stay at that level as long as inflationary pressures do not rise considerably. Their guidance is made all the more credible by the fact that they also publish their interest path forecast as a fan chart in their inflation report. In Poland, it was communicated that the interest rate level after the cycle of interest rate cuts in 2012–2013 ended (2.5 per cent) would be held unchanged;

the time horizon kept being extended.[11] The Magyar Nemzeti Bank employed forward guidance already in the easing cycle (August 2012 – July 2014) by providing more and more information about the extent of the interest rate cuts and the end of the easing cycle. In its forward guidance message after the end of the easing cycle, the MNB emphasised that, pending certain conditions stated in the forecast, reaching the medium-term inflation target requires maintaining expansionary monetary conditions. In Chile, the policy rate decreased to 0.5 per cent by the end of 2009 and the central bank declared its commitment to maintain this low interest rate until the second quarter of 2010. In contrast to these countries, Turkey has communicated that it will maintain tight monetary conditions until the inflation outlook has substantively improved. Russia has also used forward guidance, declaring that they would not cut the rate of interest in the second quarter of 2014.

The MNB was the only emerging economy central bank to carry out **quantitative easing**: it purchased government bonds for HUF 250 billion on the secondary markets in the last quarter of 2008. This was necessary, as market liquidity had contracted considerably. In parallel with the MNB's quantitative easing, the banks also boosted their government bond holdings pursuant to an agreement, so that excess liquidity grew from the tight level prevailing in the autumn of 2008.

A variety of **liquidity-providing measures** were used widely in the emerging countries as well; the details of these, however, go beyond the scope of this paper. (For details on the unconventional instruments used in Hungary during the crisis, see Krekó et al., 2012, Box 3, pp. 32–34.) Of the emerging economies analysed here, only the Czech Republic reached the zero lower bound of the nominal interest rate (the policy rate has stood at 0.05 per cent from November 2012 to the present day), but instead of the instruments employed by the central banks of the advanced economies, the Czech central bank opted for currency market interventions. At the end of 2009, Chile had a policy rate (0.5 per cent) that was near but not yet at the zero lower bound.

Only the Turkish central bank decided to **raise the inflation target**.[12] The inflation targets were reduced in Romania as the credibility of its inflation targeting grew and in Russia as it phased in inflation targeting.[13] In the case of Romania, this may be seen as a measure necessary for introducing the euro, for which it set an official target date after the inflation target was cut.

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11 One year after closing the easing cycle, they abandoned the guidance they had employed until then, as the likelihood of long-term low external and internal inflation grew.

12 The Turkish central bank raised the inflation target from 4% to 7.5% in 2009.

13 Romania set an inflation target of 7.5% with a band of ± 1 percentage point in 2005. The year-end targets were reduced gradually: they were set at 3.5% in 2009–2010, then 3% from 2011 onwards and finally at 2.5% with a ± 1 percentage point tolerance band from 2013.
Russia set a 5–6% target band in 2013, and then set a 5% target in 2014, with 4.5% for 2015 and 4% for 2016. In each case, a ± 1.5 percentage point tolerance band was set around the points target.

Other measures include the Czech central bank's use of the koruna exchange rate as a monetary policy tool to ease monetary conditions. This involved the central bank using the exchange rate as a temporary and alternative monetary policy instrument in the inflation targeting framework. It is an asymmetrical intervention that involves, in essence, not allowing the exchange rate to strengthen beyond the EUR/CZK 27 level, but letting market processes determine the exchange rate at its weaker side. The Funding for Growth Scheme launched by the MNB in 2013 is a country-specific and unconventional instrument in the "other" category, which specifically targets the SME sector to remedy the damage done to monetary transmission in the crisis and thus to support corporate lending. Another new measure is the MNB's strategy of self-financing to increase the proportion of domestic sources in financing government debt, in order to reduce gross foreign debt and thereby the country's vulnerability to external shocks. All this is consistent with the MNB's overall strategy of supporting the maintenance and strengthening of financial stability without jeopardising its primary objectives.

In discussing other measures above, it was noted that the Russian central bank is currently at the stage of introducing the IT framework; the central bank intends to complete this transition in 2015. Another strategic change is seen in the new monetary policy strategy employed by the central bank of Turkey since late-2010: reaching and maintaining price stability will remain its primary objective, but financial stability is now a supplementary objective that will underpin it.[14]

This shows that none of the emerging economies analysed have switched from inflation targeting to any different framework; on the contrary, these countries have tended to reaffirm their commitment to IT by making a shift towards the framework. Furthermore, the option of raising the inflation target tended not to apply in the emerging countries, as most of them did not face the challenges of the zero lower bound; in fact, there were some examples of reducing the inflation target as per nominal convergence. It is clear, however, that these countries were also forced to resort to unconventional monetary policy instruments or to introduce new measures to manage the problems caused by the financial crisis. In summary, the changes in the framework did not mean much change in the goals, but rather a significant change in toolkit and institutional arrangement in response to the challenges posed by the crisis. The spirit of the inflation targeting frameworks has remained intact. In light of experience gained from the crisis, these new instruments may remain integral to monetary policy and central bank practices in the future, especially as part of the unified monetary policy strategy and macro- and microprudential policy framework.

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14 The Turkish central bank has introduced a large number of new instruments (e.g. asymmetric interest rate corridor, reserve-option mechanism), but the motives for employing these instruments are often vague and the transmission they facilitate is not transparent. The use of such instruments and their inadequate communication is weakening the predictability of Turkish monetary policy and the credibility of its central bank.

5 Summary

Supplemented with certain unconventional instruments, flexible inflation targeting frameworks have been able to rise to the challenges posed by the crisis. Since the financial crisis broke out, criticisms have been directed towards the inflation targeting framework, yet international experience demonstrates that none of the central banks renounced their inflation targeting regimes; on the contrary, there are numerous instances of shifts towards such a regime, indicating that it should continue to be considered as one of the best monetary policy practices. **Upgrading the existing framework of flexible inflation targeting does not imply making goals elastic, but extending the toolkit in a way that can help identify responses to the challenges of the zero lower bound and other acute structural problems caused by the financial crisis**. As a result, the shift in flexible inflation targeting strategies during the crisis offers a framework that, besides the primary objective of price stability, allows central banks to take certain other factors (real economy, financial stability etc.) into consideration in order to meet the inflation target or to avoid deflation risks. Experience from the financial crisis has revealed, however, that working towards meeting the inflation target may, by itself, prove insufficient for maintaining long-term macroeconomic stability if financial instability is at risk. The augmented central bank toolkit offers a solution for this conflict, as it aims to reduce imbalances, vulnerabilities and risks appearing in certain segments of the financial system. In this context, the new instruments of flexible inflation targeting may remain integral parts of monetary policy and central bank practice looking forward.

References

Abo-Zaid, S. and Tuzemen, D. (2012): "Inflation Targeting: A three-decade perspective", *Journal of Policy Modeling*, Elsevier, Vol. 34 (5), pp. 621–645.

Ábel, I., Lehmann, K., Motyovszki, G., and Szalai, Z. (2014): "Deflation fears in developed economies", *MNB Bulletin*, July 2014, pp. 7–17.

Baksa, D., Felcser, D., Horváth, A., Kiss, N. M., Köber, C., Krusper, B., Soós, G. D. and Szilágyi, K.: "Neutral interest rate in Hungary", *MNB Bulletin Special Issue*, October 2013, pp. 7–13.

Ball, L. (2013): "The Case for 4% Inflation", *Central Bank Review* (Central Bank of the Republic of Turkey), May 2013. http://www.voxeu.org/article/case-4-inflation

BILLI, R. M. AND VREDIN, A. (2014): "Monetary policy and financial stability – a simple story", *Sveriges Riksbank Economic Review*, 2014:2.

BLANCHARD, O., DELL'ARICCIA, G. AND MAURO, P. (2010): "Rethinking Macroeconomic Policy", *IMF Staff Position Note*, SPN/10/03. 12 February 2010. https://www.imf.org/external/pubs/ft/spn/2010/spn1003.pdf

BORIO, C., DISYATAT, P., AND JUSELIUS, M. (2013a): "Rethinking potential output: Embedded information about the financial cycle", *BIS Working Papers* No. 404. www.bis.org/publ/work404.htm

BORIO, C., DISYATAT, P., AND JUSELIUS, M. (2013b): "Measuring potential output: Eye on the financial cycle". http://www.voxeu.org/article/measuring-potential-output-eye-financial-cycle

BORIO, C., DISYATAT, P., AND JUSELIUS, M. (2014): "A parsimonious approach to incorporating economic information in measures of potential output", *BIS Working Paper* No. 442. http://www.bis.org/publ/work442.pdf

BORIO, C. (2014): "Monetary policy and financial stability: what role in prevention and recovery?", *BIS Working Paper* No. 440. http://www.bis.org/publ/work440.pdf

BROADBENT, B. (2013): "Forecast errors", Speech given by External Member of the Monetary Policy Committee, Bank of England at the Mile End Group of Queen Mary, University of London, 1 May, 2013. http://www.bankofengland.co.uk/publications/Documents/speeches/2013/speech653.pdf

CSERMELY, Á. AND TÓTH, M. B. (2013): "Nominal GDP targeting: what are central bankers talking about?", *MNB Bulletin*, May 2013, pp. 7–11.

CSORTOS, O., LEHMANN, K. AND SZALAI, Z. (2014): "The theoretical considerations and practical experiences of forward guidance", *MNB Bulletin*, July 2014, pp. 45–55.

CSORTOS, O. AND SZALAI, Z. (2013): "Assessment of macroeconomic imbalance indicators", *MNB Bulletin*, October 2013, pp. 14–24.

FELCSER, D., KOMLÓSSY, L., VADKERTI, A., AND VÁRADI, B. (2014): "Inflation Targeting", *Methodological Manual*, Magyar Nemzeti Bank, forthcoming.

FELCSER, D. AND LEHMANN, K. (2012): "The Fed's inflation target and the background of its announcement", *MNB Bulletin*, October 2012, pp. 28–37.

FISHER, R. W. (2014): "Monetary Policy and the Maginot Line (with reference to Jonathan Swift, Neil Irwin, Shakespeare's Portia, Duck Hunting, the Virtues of Nuisance and Paul Volcker)", University of Southern California at Los Angeles, 16 July 2014. http://dallasfed.org/news/speeches/fisher/2014/fs140716.cfm

Hammond, G. (2012): "State of the art of inflation targeting", *Handbook* No. 29, Centre for Central Banking Studies, Bank of England.

Hilscher, J., Raviv, A., and Reis, R. (2014): "Inflating away the public debt? An empirical assessment", *CEPR Discussion Paper* 10078.

Krekó, J., Balogh, C., Lehmann, K., Mátrai, R., Pulai, G., and Vonnák, B. (2012): "International experiences and domestic opportunities of applying unconventional monetary policy tools", *MNB Occasional Papers* 100.

Krusper, B. and Szilágyi, K. (2013): "How can an interest rate rule reflect real economic considerations?", *MNB Bulletin*, May 2013, pp. 43–50.

Krzak, M. And Ettl, H. (1999): "Is direct inflation targeting an alternative for Central Europe?" *Focus on Transition* 1/1999, Oesterreichische Nationalbank. http://www.oenb.at/en/Publications/Economics/Focus-on-Transition/1999/Focus-on-Transition-1-1999.html

Lehmann, K., Mátrai, R. and Pulai, G. (2013): "Measures taken by the Federal Reserve System and the European Central Bank during the crisis", *MNB Bulletin Special Issue*, October 2013, pp. 100–109.

Lehmann, K. (2012): "International experiences with unconventional central bank instruments", *MNB Bulletin*, June 2012, pp. 24–30.

Leigh, D. (2010): "A 4% inflation target?" http://www.voxeu.org/article/4-inflation-target

Mcleay, M., Radia, A. And Thomas, R. (2014): "Money in the modern economy: an introduction", *Bank of England Quarterly Bulletin* 2014 Q1. http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q101.pdf

Mollick, A. V., Cabral, R. And Carneiro, F. G. (2011): "Does inflation targeting matter for output growth? Evidence from industrial and emerging economies", *Journal of Policy Modeling* 33 (2011), pp. 537–551.

Negro, M., Del Giannoni, M. P., and Schorfheide, F. (2014): "Inflation in the Great Recession and New Keynesian Models", *American Economic Journal*, forthcoming. http://www.nber.org/papers/w20055

Shirai, S. (2014): "Recent Monetary Policy Trends in Advanced Economies and the Asia-Pacific Region". https://www.boj.or.jp/en/announcements/press/koen_2014/data/ko140724a1.pdf

Svensson, L. E. O. (2008): "Inflation Targeting", in: *The New Palgrave Dictionary of Economics*, 2nd edition, Palgrave McMillan.

Svensson, L. E. O. (2010): "Inflation targeting after the financial crisis", Speech at the International Research Conference "Challenges to Central Banking in the Context of Financial Crisis", Mumbai, India, 12 February 2010. http://www.bis.org/review/r100216d.pdf

Taylor, J. B. (2008): "The Impact of Globalization on Monetary Policy", International Symposium: "Globalization, Inflation and Monetary Policy", Banque de France, March 2008, pp. 257–263.