

The impact of the easing cycle on the Hungarian macroeconomy and financial markets*

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This paper examines the easing cycle initiated by the Magyar Nemzeti Bank in August 2012 and its macroeconomic and financial market impacts. It first presents the operation of the transmission mechanism under normal economic conditions and then addresses the main challenges of the post-crisis period. It gives an overview of the impact of the interest rate cycle on various financial markets and the macroeconomy. The paper concludes that based on the estimates provided by the Magyar Nemzeti Bank's forecasting model, the easing cycle has decreased the rate of the undershooting of the central bank inflation target and significantly contributed to increasing the level of economic output.

Journal of Economic Literature (JEL) Classification: E43, E52

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1. Introduction

The global financial and economic crisis which started in 2007–2008 sharply reduced global economic growth, due to the slump in investment activity and consumption demand. In addition, the protracted balance sheet deleveraging of economic agents indebted prior to the crisis and the tight lending conditions maintained by banks led to a downturn in lending activity, while the economic recession led to a material rise in unemployment, and the global drop in demand triggered decreasing inflation, followed by a sustained low-inflation environment in most economies. Following the onset of the crisis, advanced economies initially responded to adverse macroeconomic developments with both fiscal and monetary easing. Globally influential central banks (the European Central Bank, the Federal Reserve, the Bank of Japan and the Bank of England) first reacted to the economic recession by cutting their base rates, which relatively quickly reached or approached the nominal lower bound. In most cases, however, these steps proved to be insufficient monetary easing on their own to foster recovery, and thus other non-conventional monetary

* The views expressed in this paper are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

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policy tools (such as quantitative easing or forward guidance) were needed, besides traditional interest rate policy. The crisis also affected Hungary deeply, and thus the necessary economic policy and monetary policy responses were needed. The Magyar Nemzeti Bank (MNB) responded with several measures to the challenges of the persistently low inflation environment, restrained lending activity and Hungary's external vulnerability.

The Magyar Nemzeti Bank responded to the challenges stemming from the sustained low inflation environment that emerged in the wake of strong disinflationary impacts by initiating an easing cycle in August 2012, and has since cut the key policy rate by 565 basis points in total over the past three years. The easing cycle affects the economy and economic agents' expectations through numerous channels (*MNB 2012b*). Alongside gradual interest rate cuts, the MNB also applied other non-conventional tools to address the monetary policy transmission difficulties caused by the crisis, in order to achieve the 3 per cent inflation target, boost economic growth and decrease Hungary's external vulnerability. In April 2013, the central bank launched its Funding for Growth Scheme in an effort to alleviate the disruptions in the lending to small and medium-sized enterprises and thus foster quicker economic growth. In view of the robust demand exhibited by enterprises for the Scheme, in September 2013 the Monetary Council of the MNB decided to continue the FGS. The programme managed to halt the shrinking volume of corporate credit and created credit conditions which improved enterprises' investment appetite, thereby improving monetary policy transmission. In order to boost the positive impact of the Funding for Growth Scheme, in February 2015 the Monetary Council decided to launch the FGS+, a scheme similar to the FGS but independent of it (*MNB 2015a*).

Besides fostering lending activity and economic growth, several other programmes were launched to mitigate Hungary's external vulnerability. In April 2014, in an effort to increase the financing of government debt from internal funds and concurrently reduce its dependence on external funds, in other words to reduce Hungary's external vulnerability, the central bank launched its self-financing programme and began the associated transformation of its set of monetary policy instruments. In the context of the latter, in August 2014 two-week MNB bills were first converted to a two-week deposit facility, and since the end of September 2015, the three-month central bank deposit has served as the MNB's main policy instrument. The Magyar Nemzeti Bank's support for the forint conversion of foreign currency-based mortgage household loans also contributed to mitigating Hungary's external vulnerability, and enabled financial system participants to prepare for averting the adverse impacts from exchange rate risk (*MNB 2015b*).¹ Monetary policy

¹ On 15 January 2015, the Swiss central bank abandoned the exchange rate cap against the euro, resulting in the sudden and significant appreciation of the Swiss franc and causing significant money market turmoil worldwide. In Hungary, the conversion exchange rate for foreign currency-based mortgage household loans had already been fixed in November 2014, shielding the Hungarian banking system and households with Swiss franc-denominated loans from the strengthening Swiss franc.

transmission improved along with a material reduction in the volume of foreign currency loans: once forint loans became predominant, and the effectiveness of both the interest rate channel and the exchange rate channel improved.² This paper examines in more detail the rate cut cycle initiated by the Magyar Nemzeti Bank in August 2012 and its macroeconomic and financial market impacts.³

2. The monetary policy transmission mechanism in a traditional and non-traditional environment

Modern central banks engaged in inflation targeting attempt to shape prices and developments in inflation mostly taking into account fluctuations in economic output as well. The monetary transmission mechanism refers to a complex, multi-level process through which monetary policy can exert influence on macroeconomic developments. In this section, we first present the operation of the transmission mechanism under normal economic conditions and then address the main challenges of the post-crisis period.

In advanced economies, central banks primarily shape market developments using short-term financial instruments. These instruments are mainly loans or deposits with the maturity of one or two days or a few weeks, and are made available to commercial banks at an interest rate set by central bank decision-makers. In Hungary, this instrument has been the three-month MNB deposit since September 2015, which replaced the earlier two-week deposit, with a yield equal to the central bank base rate. The use of longer-maturity instrument is not without precedent; many countries have opted to introduce longer-maturity active or passive central bank instruments in recent years. Although there are fewer international examples of central bank policy instruments having maturities of three months or longer, some examples can nevertheless be found: the Swiss central bank's key policy rate is the 3-month reference rate for unsecured interbank loans (LIBOR).⁴

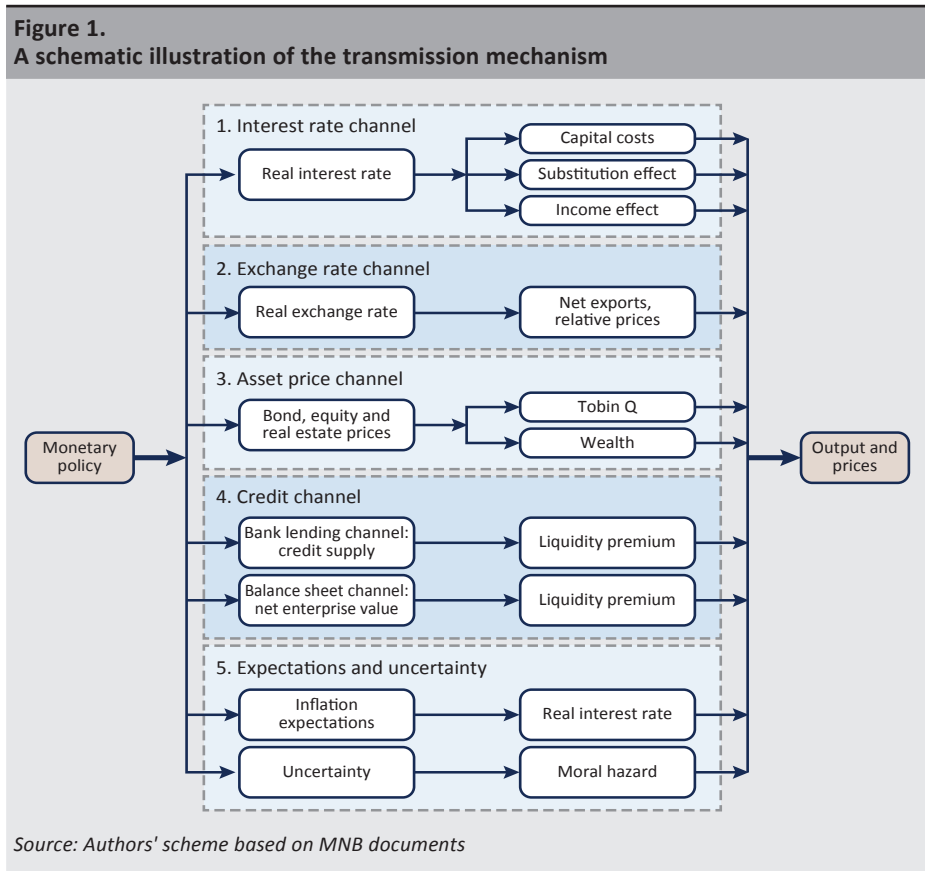
Typically, five different channels of monetary policy transmission can be distinguished (*Figure 1*): the interest rate channel, the exchange rate channel, the asset price channel, the credit channel and the expectations channel. Each of these channels represents a unique mechanism through which monetary policy actions reach market demand. Prices can only react to changed demand with some lag, resulting in output temporarily diverging from its long-term level. Monetary

² Due to the elevated ratio of foreign currency loans, an expansive monetary policy step taken earlier may have, contrary to the central bank's intentions, held back the consumption demand of households indebted in a foreign currency due to its impact in terms of exchange rate depreciation.

³ The results of the first one and a half years of the FGS are presented by *MNB (2014d)*.

⁴ In addition, the Czech central bank holds a 3-month repo tender when necessary as another sterilisation instrument, while the Bank of England and the Swedish and Israeli central banks also use sterilisation instruments with maturities of one month or longer.

policy also impacts the supply side through production costs. The following section presents in detail the functioning of three channels of transmission during normal times.



The simplest monetary policy channel which transmits impulses is the interest rate channel. For example, commercial banks can access loans from the central bank at a lower cost following a central bank interest rate cut (if the key policy rate is linked to a loan instrument), or banks receive a lower interest on their deposits placed at the central bank (if the key policy rate is linked to a deposit instrument), which results in commercial banks cutting interest rates on their loans extended to customers or on the deposits placed with banks. Lower interest rates spur households to borrow more and reduce their savings, in other words, to consume more. Corporations are mainly influenced by interest rates in terms of their investment decisions: a lower interest rate enables more projects to generate the return needed for companies to be profitable, which boosts investments.

The economic impact of central bank interest rate cuts fundamentally depends on the extent and speed at which the interest rate cut passes through to the interest rates relevant for corporations and households. *Horváth et al. (2004)* demonstrated that in Hungary, commercial bank interest rates substantially follow changes in the central bank interest rate within a few months, in other words banks effectively transmit monetary policy decisions. In case of the corporate segment, loans and deposits typically feature short-term maturities and are therefore repriced relatively quickly. On the household side, however, repricing takes longer and only appears in forint-denominated instruments.

At the same time, in addition to its direct impact, a declining policy rate can also impact price-setting and production decisions through the exchange rate channel. In the case of free international movement of capital, exchange rates may react sensitively to interest rate policy. Interest rates and exchange rates are linked by interest rate parity. As international portfolio investors can choose freely among currencies, the returns achieved on various currencies cannot diverge for long. Actual return is determined by changes in the interest rate and the exchange rate together. If the total of interest rate and exchange rate gains falls short of the return attainable elsewhere, investors will turn from the specific currency until either interest rates or the appreciation of the exchange rate once again render it competitive. The exchange rate channel plays a prominent role particularly in small, open economies (such as Hungary) due to the fact that the value of domestic currency directly impacts the price of imported goods and the competitiveness of exported goods. A depreciation of the exchange rate triggers higher external demand for export goods, but it may go hand-in-hand with a decline in the import of foreign goods, which become more expensive. Domestic output thus expands overall, while prices increase due to tradable goods becoming more expensive.

The expectations channel is an important component of the transmission mechanism both in itself and as a part of other channels. If the monetary policy target is credible, rational economic agents expect it to be attained. In an inflation targeting system, this means that the inflation expectations of economic agents are anchored by the central bank inflation target. If an inflation shock hits the economy, economic agents trust that monetary policy will do everything in its power to neutralise the shock (e.g. react with an interest rate cut to expectations of sustained low underlying inflation), and thus they will not expect inflation to diverge significantly from the target in the medium term. Expectations anchored to the central bank's inflation target make the central bank's work "easier" in this case, as pricing behaviour and wage demands will not exert extra inflationary pressure and the inflation target can be achieved with a minimal growth sacrifice. Expectations therefore have often key importance in terms of monetary policy.

It is important to stress that in some cases, the monetary policy transmission mechanism functions differently than the theoretical framework. This is because in practice, various transmission channels are often unable to work effectively enough in the expected manner based on theory. After the crisis, the transmission mechanism was hindered in many countries across the world (for the euro area, see for instance *ECB 2013*).⁵ The underlying reason was the excessive indebtedness of economic agents accumulated prior to the crisis and the protracted deleveraging that followed the onset of the crisis, in the context of which economic agents significantly increased their savings and restrained their consumption and investment expenditures (*Csortos–Szalai 2015*). As a result, the effectiveness of traditional monetary policy is decreased through deleveraging, and this prevails as long as the private sector engages in deleveraging and borrowing appetite does not begin to recover. In the wake of the reduction in the private sector's need for funding, the traditional instrument of monetary policy loses some of its effectiveness and thus the interest rate channel partly loses its ability to impact the economy. Nevertheless, deleveraging by economic agents may be fostered in different ways. For example, fiscal policy may be instrumental in encouraging the deleveraging of the private sector. The exchange rate cap scheme launched in spring of 2012 is an example of this applied in Hungary, which helped alleviate the exchange rate risk and interest burden of consumers with foreign currency loans. In addition, concurrently to cuts to the policy rate, state interest expenses and debt renewal costs decrease alongside government securities yields, leaving more leeway for fiscal policy to stimulate the economy. It also stimulates deleveraging if the depreciation of the real exchange rate contributes to economic recovery by improving competitiveness and thus contributing to export growth.

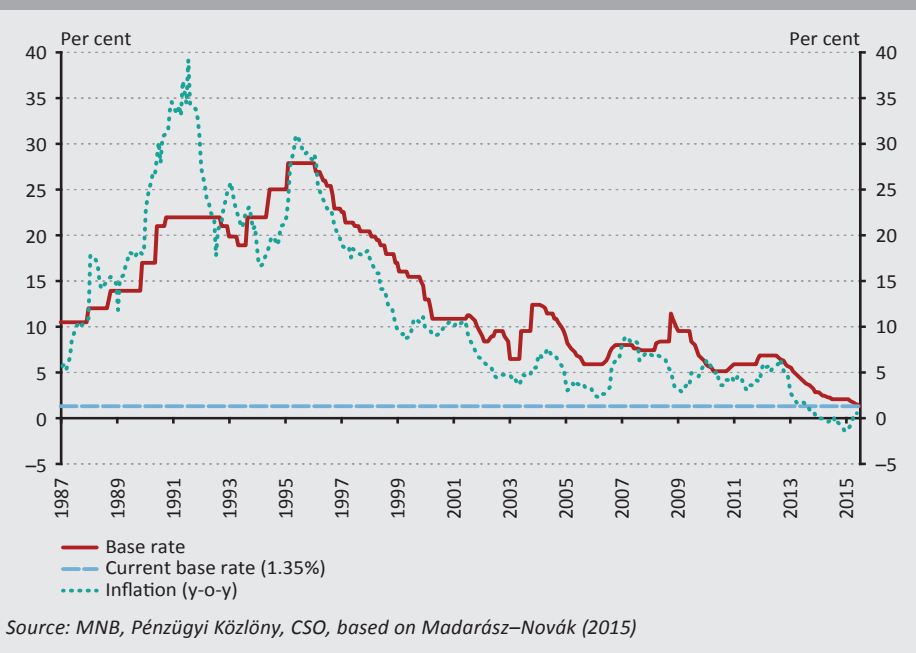
For Hungary, besides the interest rate channel of monetary policy, the smooth functioning of the exchange rate channel was also hindered due to the high ratio of foreign currency-denominated debt. Normally, a depreciating exchange rate alongside an accommodating monetary policy is able to contribute to the balance sheet deleveraging process by positively impacting output and income flow. In Hungary's case, however, given the high ratio of foreign currency debt held by economic agents prior to forint conversion, a potential exchange rate depreciation would have stimulated export, but adversely affected economic agents' net income position and resulted in weaker demand. This adverse correlation was somewhat offset by the early repayment scheme and the introduction of the exchange rate cap, while the forint conversion of foreign currency-based household mortgage loans in 2015 essentially put an end to households' high sensitivity to the exchange rate.

⁵ Conversely, according to the findings of *Borstel et al. (2015)*, the effectiveness of the euro-area interest rate channel did not change compared to the pre-crisis period, although traditional monetary policy lost some of its ability to shape premiums on bank loans. *Kucharčuková et al. (2013)*, examining several channels, also failed to identify any significant change in monetary policy transmission resulting from the crisis.

3. Phases of the Hungarian rate cut cycle

Starting from August 2012 the Magyar Nemzeti Bank deployed various tools to achieve its mandate defined in the Central Bank Act, first and foremost of achieving and maintaining price stability, and supporting — without jeopardising the primary objective — the maintenance of financial stability and the government’s economic policy with the available instruments. Gradual interest rate cuts implemented starting from the end of summer 2012 have brought the central bank’s key policy rate down by 565 basis points overall, to a historic low (Figure 2). The easing cycle was initially enabled by Hungary’s gradually improving risk perception and the permanently loose monetary policy stance adopted by globally influential central banks, and also supported by Hungarian fiscal policy actions. During the second phase of the easing cycle — while Hungary’s risk perception continued to improve — strong disinflation and supporting economic growth called for a continuation of monetary easing. The uncertainty in the international financial environment nonetheless warranted a cautious monetary policy, which was implemented with a smaller step than the earlier 25 basis points. The third phase of the easing cycle commenced in March 2015, when increasing downside risks to inflation pointed in the direction of further easing of the monetary stance.

Figure 2.
Developments in the policy rate and inflation in Hungary
 (1987–2015)



At the beginning of the easing cycle, the increase in international risk appetite and the gradual improvement in Hungary's risk perception supported rate cuts implemented in gradual steps. In addition, the sustained accommodative monetary policy conducted by globally influential central banks and the fiscal actions taken in Hungary both increased the room for manoeuvre in Hungarian monetary policy. At the beginning of the rate cut cycle, although inflation substantially exceeded the central bank's 3 per cent inflation target, the baseline projection assuming an endogenous interest rate trajectory predicted inflation decreasing to the central bank's target over the horizon relevant for monetary policy along with the opportunity for a material easing of monetary conditions, in the case of a sustained improvement in risk perception and the fading of shocks increasing the price level (*MNB 2012a*). This is because above-target inflation was mainly attributable to idiosyncratic factors, and once these transient factors had faded, a strong disinflationary period commenced from late 2012.

Prior to the start of the easing cycle, global investor sentiment was favourable. The material improvement in risk appetite was mainly linked to the positive events surrounding the euro area's stability. The still uncertain financial market environment in early 2012 had significantly improved in the wake of the Greek elections in June, the Spanish bank bailout package and governor of the ECB, Mario Draghi's statement issued in late July,⁶ and later by the announcement of the introduction of non-conventional tools (relaunch of the ECB's bond purchases⁷). As risk appetite increased, the expected premium on emerging market assets decreased tangibly. In parallel, the Hungarian risk spread also shrank significantly: from the beginning of June 2012 until the end of August, the Hungarian five-year CDS spread shrank by 200 basis points, and ten-year yields also fell strongly in line with these developments. With the improvement in risk perception, Hungary's required risk premium gradually declined to reach the emerging market average, which was also fundamentally driven by improving fiscal discipline (*MNB 2014a*). Following budgetary adjustments, Hungary's fiscal deficit according to the ESA methodology edged down to 2.3 per cent of GDP in 2012. In addition, government debt embarked on a downward path, which went hand-in-hand with a reduction in Hungary's external vulnerability. In the context of the supportive global monetary policy setting, the Monetary Council of the MNB first cut its key policy rate in

⁶ In his speech given on 26 July 2012, Mario Draghi alluded to the possibility of the ECB conducting a more flexible monetary policy in the future, firmly helping crisis management within the euro area. In his statement, the governor of the ECB stressed that increase in the size of sovereign premia, amongst other things, hampers the functioning of the monetary policy transmission channel, and that the central bank will use every tool within its mandate to address the issue and to maintain the stability of the euro (*ECB 2012a*).

⁷ The ECB announced on 2 August 2012 that, within the framework of the so called "Outright Monetary Transactions" (OMT) programme, the ECB if needed – and if the given euro-area member state fulfils criteria laid down by the ECB – will purchase sovereign government bonds on the secondary market to ensure the adequate functioning of the monetary transmission mechanism (*ECB 2012b*).

increments of 25 basis points from the initial 7 to 4 per cent between August 2012 and July 2013.

Hungary's risk perception continued to improve during the second phase of the easing cycle thanks to its more positive net lending capacity compared to vulnerable emerging countries, disciplined government policy and the lifting of the excessive deficit procedure in place since 2004. In addition, the monetary policy of globally influential central banks remained accommodative during this period, and thus in this broadly supportive international money market sentiment, Hungary's risk spread shrank to pre-crisis levels. Besides these supportive factors, subdued domestic demand, the negative output gap, the reduction of administered prices in a series of steps, moderate imported inflation and the gradual reduction in inflation expectations gave rise to a strongly disinflationary environment within the Hungarian economy, warranting a continuation of the easing cycle.

The disinflation observed from late 2012 was the combined result of several factors. The drop-out of former indirect tax rises from the base and the series of administered price cuts significantly reduced the direct inflationary impacts stemming from government measures. In addition, the slack that emerged during the crisis and continues to prevail in the economy, subdued domestic demand and waning global inflation also reinforced disinflation in Hungary. As a result of these factors, indicators reflecting developments in underlying inflation gradually declined in 2013 and continue to remain low.⁸ Falling inflation expectations also contributed to sustained low inflation environment alongside a decline in actual inflation. In addition, inflation expectations aligned with the central bank target also reduced inflationary pressure from the labour market through lower wage dynamics, further increasing the room for manoeuvre in monetary policy.

Overall, the lasting disinflationary environment, inflation falling below the central bank's 3 per cent target and, looking forward, the inflation outlook warranted a further easing of the monetary stance. Accordingly, the central bank cut the key policy rate by an additional 190 basis points to 2.1 per cent by July 2014, in increasingly smaller increments in light of potential adverse external shocks, and then ended its two-year continuous easing cycle. In its forward guidance, the Monetary Council stressed that "the macroeconomic outlook points in the direction of persistently loose monetary conditions" (*MNB 2014b*).

The central bank then maintained the base rate at 2.1 per cent until March 2015. In the Monetary Council's assessment, there continued to be a degree of slack in the economy and the real economy's disinflationary impact decreased looking forward, and maintaining the prevailing monetary conditions would be conducive

⁸ From January 2014, the Magyar Nemzeti Bank publishes its measures of underlying inflation with monthly frequency.

to inflation in line with the target over the medium term. Reacting to the further decline in inflation mainly due to falling energy prices, in its December 2014 Inflation Report the central bank signalled that downside risks to inflation had increased (*MNB 2014c*), but macroeconomic prospects at the time did not warrant further cuts to the key policy rate.

In March 2015, however, following a comprehensive assessment of the current Inflation Report, the Monetary Council decided to relaunch the easing cycle and carry out a 15-basis-point interest rate cut. Further monetary easing was warranted by increasing downside risks to inflation, as decision-makers deemed that “the probability of second-round effects taking hold in the wake of the change in inflation expectations has increased” (*MNB 2015c*). To achieve the inflation target over the monetary policy horizon, the central bank cut base rate in steps of 15 basis points to 1.35 per cent by July 2015, and then ended its interest rate-cutting cycle renewed in March. The Magyar Nemzeti Bank cut its key policy rate by an overall 565 basis points between August 2012 and July 2015, which was in line with the accommodative monetary policy conducted by globally influential and regional central banks in an international context.⁹ In its announcement closing the cycle, the central bank indicated that based on its forecast, macroeconomic prospects pointed in the direction of loose monetary conditions over a sustained period.

4. Impact of the easing cycle on Hungarian financial markets

The gradual decrease in the central bank base rate fed through to financial market interest rates as the first step of monetary policy transmission, while also exerting a positive impact on government securities yields. In addition to monetary policy easing, other international and domestic events and developments (such as changing risk perception) are also reflected in interest rate and yield levels, but over a longer time horizon spanning several years a close correlation can be identified between the key policy rate and market interest rates. Based on these similar tendencies, monetary policy may have contributed substantially to bringing interest rates and yield levels to a historical low. Meanwhile, the gradual, cautious interest rate moves and central bank’s forward guidance helped the easing cycle

⁹ During the period under review, the Federal Reserve maintained its 0–0.25 policy rate following the tapering of its asset purchase programme and continued to maintain a very loose monetary policy stance. After the base rate had reached the nominal lower bound, the ECB announced additional non-conventional instruments and began its government bond purchase programme in March 2015 in an effort to further ease monetary conditions. The Bank of Japan, with interest rate had been zero per cent for a sustained period, has also rolled out additional non-conventional tools: it announced its Quantitative and Qualitative Monetary Easing Programme in April 2013. The Bank of England was also incapable of implementing monetary easing using conventional tools once its key policy rate reached 0.5 per cent, and so it launched its Funding for Lending Scheme in July 2012. Central banks within the region also carried out substantial monetary easing during this period: the Romanian central bank cut its base rate by 350 basis points and the Polish central bank by 325 basis points between August 2012 and July 2015, while the Czech central bank, reaching its nominal lower bound, used the koruna’s exchange rate as a monetary policy instrument to further ease monetary conditions.

unfold without disrupting the market or jeopardising financial stability. The following section looks at the impact of the interest rate cycle on various financial markets and looking forward market analyst expectations.

Interest rate cuts gradually fed through to short-term money market yields (*Table 1*). During the easing cycle, short-term money market yields correlated strongly with the declining base rate while remaining within the interest rate corridor. Hungarian ex-ante real interest rates (over a one-year period) remained close to the emerging market average for a large part of the period in the low inflation environment coupled with the falling interest rate (*MNB 2014a*).

Although the narrowing of the Hungarian interest spread may have partly contributed to the depreciation of the forint against the euro, thanks to the gradual nature of interest rate cuts and the forward guidance, this impact was felt gradually, coupled with a trendlike decline in risk indicators and without triggering a rise in volatility. Most of the volatility in the exchange rate and risk perception stemmed from international and domestic factors independent of the MNB (primarily the tapering of the Federal Reserve's quantitative easing, geopolitical tensions and the uncertainty surrounding foreign currency loan contracts prior to forint conversion). Interest rate cuts broadly went hand-in-hand with a depreciation of the forint exchange rate consistent with the achievement of the inflation target and not giving rise to financial stability risks.

Table 1.
Developments in the central bank base rate and various interest rates and yields

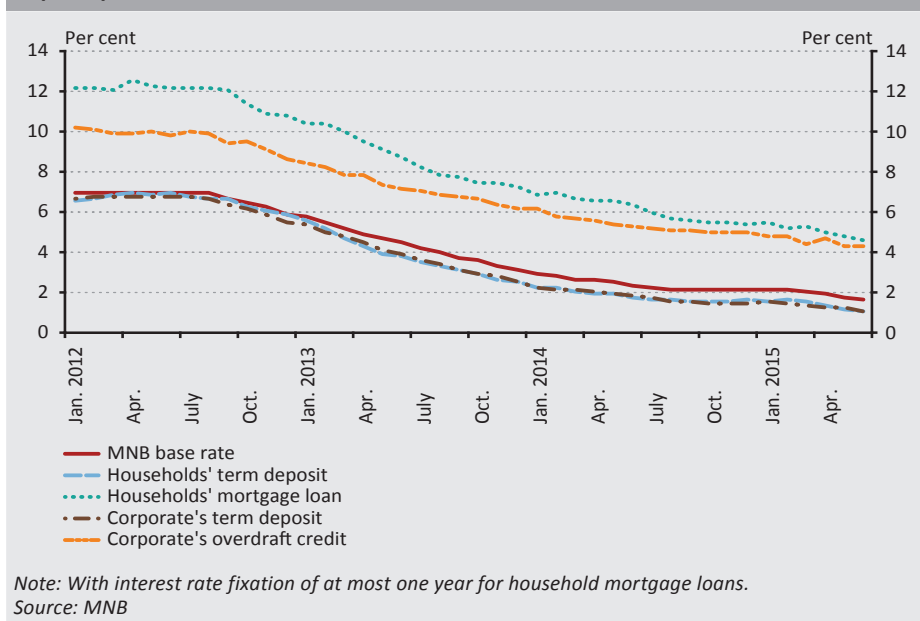
	Base rate	BUBOR 3M	Government securities' yields					Bank interest rates				CDS (5-year)
			3-month	12-month	3-year	5-year	10-year	Households' term deposit	Households' mortgage loan	Corporate's term deposit	Corporate's overdraft credit	
Start of interest rate cycle	7.0	7.15	6.8	6.8	6.8	7.1	7.4	6.7	12.1	6.6	9.9	425.0
End of 2-year cycle	2.1	2.14	1.8	1.9	3.0	3.3	4.2	1.7	5.9	1.7	5.2	169.9
Re-start of the cycle	2.1	1.97	1.5	1.7	2.1	2.5	3.2	1.6	5.3	1.4	4.4	131.5
Current	1.35	1.36	0.9	0.9	2.2	2.8	3.7	1.1	4.6	1.1	4.3	149.8

Note: Interest rates on bank products include averages weighted by the contractual amount (June). Dates: start of the interest rate cycle: 28 August 2012, end of the two-year interest rate cycle: 23 July 2014, relaunch of the interest rate cycle: 24 March 2015, current: 31 July 2015.

Source: Bloomberg, MNB, Government Debt Management Agency

Cuts to the central bank base rate also decreased bank interest rates. Due to reference pricing, the prudent reduction in the central bank base rate exerts a continuous impact on the interest rates on bank products. Since the launch of the interest rate cycle, an overall decline of 750 basis points was observed in household mortgage loans and a nearly 570 basis point decline was observed in corporate overdraft credit (Figure 3). The former also saw an additional decline of 50-60 basis points compared to February 2015 since the relaunch of the easing cycle. The easing cycle significantly reduced corporate and household interest burdens through lower bank interest rates on loans.

Figure 3.
Developments in the MNB base rate and the interest rates of certain forint loan and deposit products



Households' net savings remain elevated despite the interest rate cuts. The interest rate cuts therefore — unsurprisingly in the context of deleveraging — did not materially change households' consumption and savings decisions: households' borrowing appetite remained subdued despite falling interest rates on loans on the lending side, while the reduction in savings that should have theoretically occurred due to falling deposit rates was offset by several factors (MNB 2014a). Firstly, households taking part in the early repayment scheme saw a sharp reduction in their financial assets, which may have significantly increased their propensity to save, and secondly, GDP-proportionate savings increased further due to higher income growth. Finally, self-provision and pre-savings have also played a role,

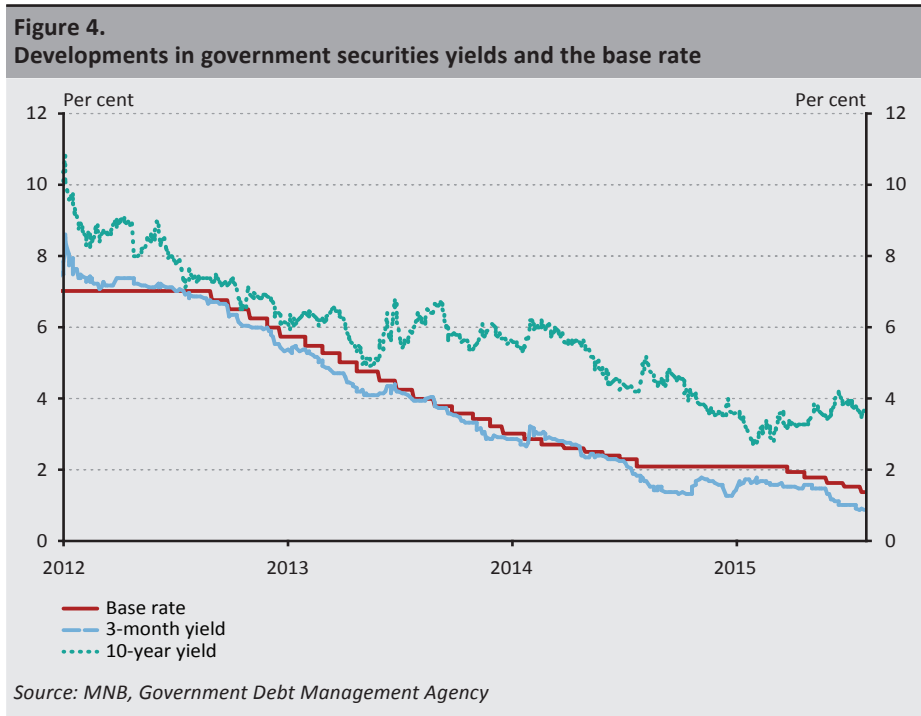
reinforced by the tax allowances on longer-term savings, uncertain growth prospects during the years of the crisis and demographic trends.

Despite the decreasing interest rate level, Hungary's external surplus has been elevated for a longer period now, which reduces the risk premium. The yield curve was pushed downward in the wake of central bank measures and fiscal consolidation, also decreasing the financing costs of forint debt. Lower forint interest expenditures may have also narrowed the income balance deficit and thus improved the external balance. Over the past period, certain debt ratios with significant relevance in terms of Hungary's vulnerability have also improved, which may have contributed to the decrease in the risk premium.

Government securities yields have also fallen substantially since the start of the easing cycle. Central bank programmes (the easing cycle, the self-financing programme, transformation of central bank instruments) also contributed markedly to falling yields and higher demand for government securities, along with the international environment, the favourable outlook for the Hungarian economy and disciplined Hungarian fiscal policy. The decline in yields varied across various maturities, standing at 585 basis points on average for maturities of one year or less, and 355 basis points on average for longer maturities (10 and 15 years) by the end of July 2015. The self-financing programme set the objective of changing the structure of government debt financing, and may have also contributed to declining yields. The fall in yields translated to a 420 basis point and 170 basis point decline until the announcement of the self-financing programme (April 2014), while the central bank cut the key policy rate by 440 basis points. The decline in yields since August 2012 has been of 480 basis points on average over the past period. From March 2015, the average impact of the relaunch of the interest rate cycle and the second phase of the self-financing programme on shorter maturities was in line with the cut to the key policy rate, however in case of longer maturities, international trends resulting in rising yields prevailed.

During the easing cycle, yields on short and medium (3–5 years) maturities closely moved with the falling base rate, and after the announcement of the self-financing programme, they are materially lower than the Hungarian key policy rate due to rising demand. Long-term yields did not follow the decline in the base rate as closely, but did nonetheless exhibit a broad trend-like decrease. This is no surprise, as monetary policy is able to influence short-term yields more effectively, but the central bank is also able to impact longer maturity yields through a predictable interest rate cycle and forward guidance. The decline in longer maturity yields was supported by falling inflation expectations, disciplined fiscal policy and significantly improving external balance, while developments in international risk appetite also supported the process throughout the majority of the period. At the same time, long-term yields (10 years or more) began rising in mid-2015 mainly due to the

heightened probability of Greek sovereign default, rising inflation expectations for the euro area and expectations regarding the Fed's interest rate hike (Figure 4).



In the wake of the significant decline in Hungarian government securities yields, general government interest savings may be over 1.7 per cent of GDP in the long run (Kicsák 2015). The degree of interest rate savings will increase in parallel with the gradual repricing of debt. Compared to the initial 2012 trajectory — assuming an unchanged base rate and government securities yields — interest expenses had decreased by nearly 0.6 per cent of GDP by 2014, while estimated interest expenses may shrink by an annual 1.7 per cent of GDP in the long run, assuming a sustained low interest environment, a reduction in the ratio of foreign currency debt parallel to a rise in forint financing and a stable forint exchange rate (Table 2). Based on the estimate, 0.2 per cent of the decline in the long run is linked to the transformation of the set of instruments announced in June and implemented in September 2015.

The interest rate cuts also materially improved the MNB's net interest income. The key policy rate cut directly reduces the central bank's interest expense on one hand, while exerting indirect impacts on the other hand: demand for cash, representing an interest-free source of funding for the central bank, increases due to its lower opportunity cost, and falling deposit rates lead to substantial portfolio restructuring

among households (Kékesi *et al.* 2015). The MNB's cumulative interest savings since the start of the easing cycle by mid-2015 is nearly 2 per cent of GDP, despite the rise in the volume of sterilisation instruments. At the same time, the financing costs and risks of the consolidated general government are also shrinking.

Table 2.
An estimate of cumulative interest savings by the state and the MNB

		2012	2013	2014	2015	2016	2017	2018	2019	After 2020
Government's interest saving	– percentage of GDP	0.04	0.3	0.6	0.9	1.1	1.3	1.4	1.5	1.7
	– billion forint	12	93	192	291	400	496	542	592	721
MNB's interest saving	– percentage of GDP	0.01	0.5	1.4	1.8					
	– billion forint	4	143	452	620					

Note: The MNB's interest savings based on the forint interest expenses on the stock of sterilisation instruments, reserve requirements and government deposits. The 2015 value factors in the MNB's interest savings until the middle of H1.
Source: Kicsák (2015), MNB calculation

The gradual feed-through of prudent interest rate cuts into market yields, the flat interbank forward yield curve and analysts' inflation expectations signal that market participants regard the low inflation environment as being in line with the central bank's inflation target. The median interest rate expectations of market participants for end of 2015 and 2016 fell in parallel with the easing cycle, while inflation expectations are gradually approaching the 3 per cent inflation target following a temporary negative inflation environment (MNB 2014a). Looking forward, when one-off price level reducing items have a smaller impact on forecasts, inflation expectations remained firmly anchored.

5. Domestic macroeconomic impacts of the easing cycle

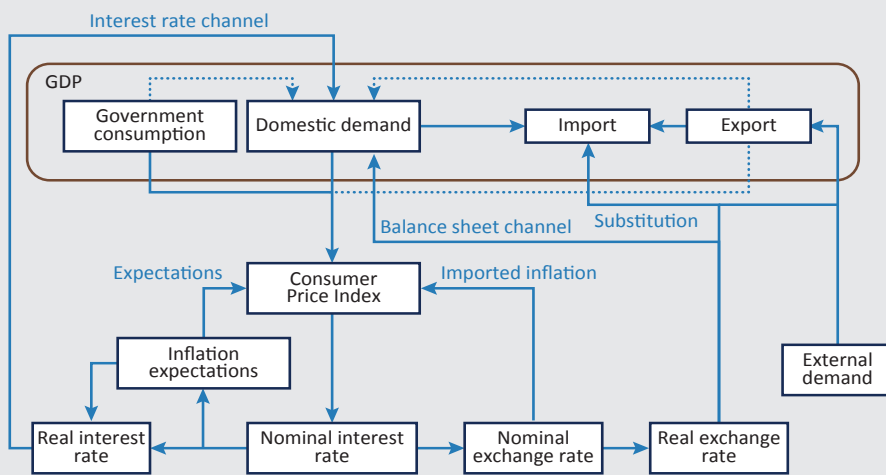
5.1. Brief summary of the forecasting model

The MNB's macroeconomic forecasts are prepared based on numerous expert and partial models in addition to the main Monetary Policy Model (MPM). At the same time, the central model incorporates and compresses the different expert inputs and illustrates the main channels of monetary policy transmission. These characteristics make it suitable for estimating the macroeconomic impacts of the easing cycle on the Hungarian economy. Before presenting the estimates, we briefly present the main features of the model.¹⁰

¹⁰ For a more in-depth description of the model, see Szilágyi *et al.* (2013).

The MPM is a quarterly macroeconomic model containing the main macroeconomic indicators and relationships, calibrated based on theoretical and empirical relations, and describing a small, open economy. The members of this family of models share the common trait of describing key mechanisms through four relations. (i) Domestic demand depends on disposable income and the real interest rate. (ii) The exchange rate depends on current and future interest rate spreads and the risk premium. (iii) Inflation depends on demand and production costs. (iv) The interest rate path implied by the model is described by the Taylor rule, according to which the interest rate path is shaped by the expected indirect tax-adjusted rate of inflation and the current cyclical position of the real economy.

Figure 5.
Flowchart of the MPM



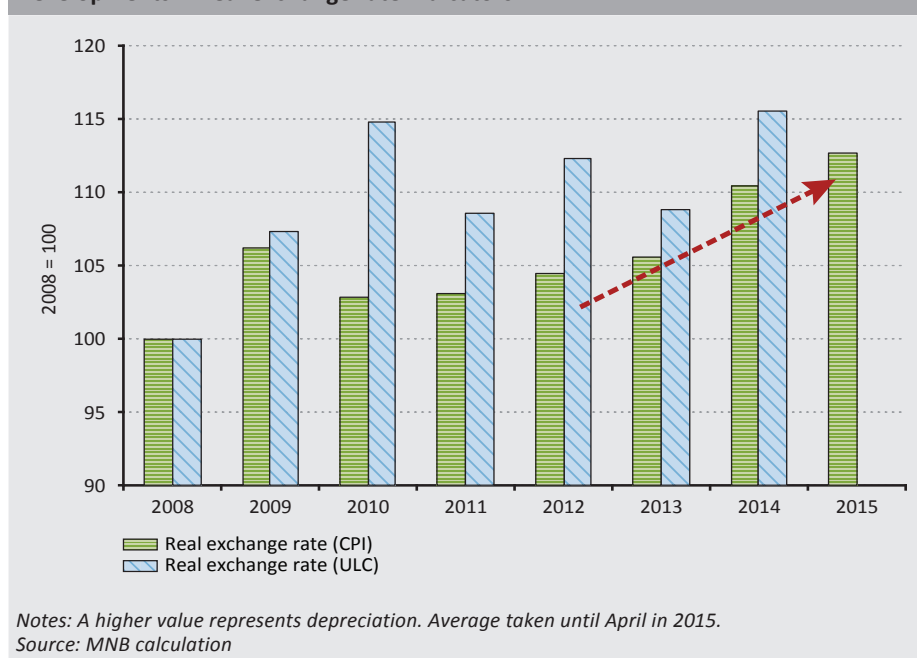
Source: Szilágyi et al. (2013)

5.2. Macroeconomic impacts of the easing cycle

In small, open economies such as Hungary, interest rate cuts bolster the economy's price and cost-based competitiveness through depreciation of the real exchange rate, thereby fostering more dynamic export growth. Hungary has seen both its so-called unit labour cost-based and consumer price-based real exchange rate depreciate over the past period (Figure 6). In the first part of the review period, the direct interest rate channel may have been less effective on households' consumption and savings decisions due to the high outstanding foreign currency debt burden accumulated prior to the crisis, and thus the stimulating effect of interest rate cuts on the economy may have been tied to the pick-up in exports,

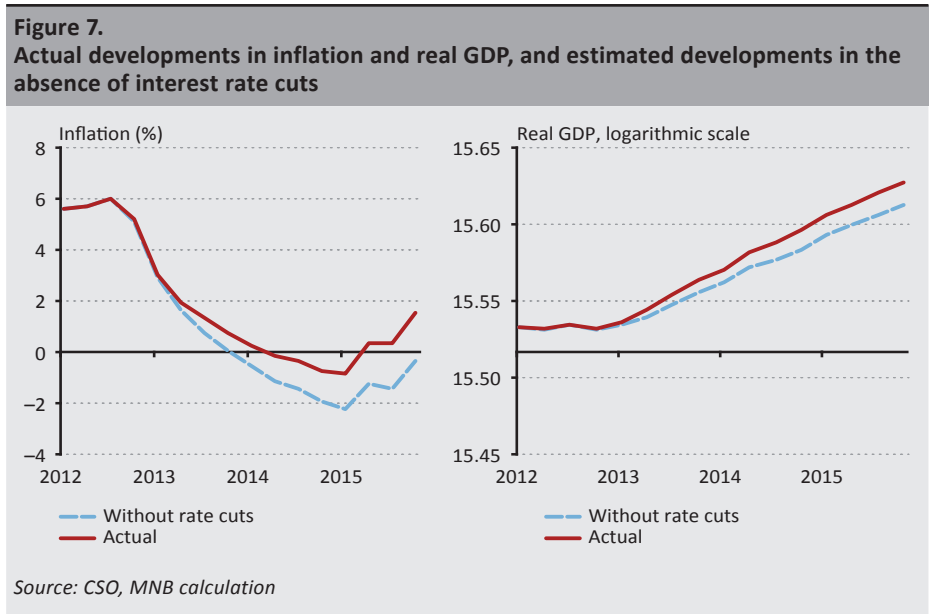
rather than to rising consumption. At the same time, the forint conversion undertaken this year removed a large portion of the high-risk item that was foreign currency credit from household balance sheets, and therefore looking forward, the stimulating effect of the interest rate channel may increase, and thus interest rate cuts may contribute to a greater extent to stimulating consumption this year and next year, helping boost domestic demand. In summary, interest rate cuts may have thus boosted the Hungarian economy through exports stimulated through the depreciating real exchange rate prior to forint conversion, and rising consumption may contribute increasingly to Hungarian economic growth going forward after forint conversion.

Figure 6.
Developments in real exchange rate indicators



Since August 2012, the key policy rate has gradually declined to its current level, which – while decreasing the rate of undershooting the central bank inflation target – also contributed substantially to elevating the level of economic output. The central bank’s changes in the interest rate feed through to prices with a certain lag (typically from one year), so the interest rate cuts of the past period will exert their impact this year and next year. The overall easing cycle may have increased average inflation by 1.1 percentage point last year and may increase average inflation by 1.6

percentage point this year. Without interest rate cuts, inflation would have possibly dipped significantly into the negative range (below –1 percent) both last year and this year, creating the risk of a period of persistent deflation (*Figure 7*).



Since the beginning of the easing cycle, the Hungarian economy’s price and cost-based competitiveness has improved in regional terms, which may have contributed to economic growth through the pick-up in exports. In addition, the falling key policy rate also gradually boosted consumption and investments. In 2013 and 2014, the stimulating effect of interest rate cuts may have been felt primarily through improving export performance thanks to the gradually depreciating real exchange rate. At the same time, from 2015 — in the wake of the forint conversion of the majority of households’ foreign currency loans — the interest rate channel of monetary policy transmission will increase in efficiency, so a far lower interest environment will exert a much more direct impact on households’ consumption and savings decisions, thereby increasing the contribution of domestic demand to growth. Overall, due to the above impacts, interest rate cuts have in and of themselves boosted the performance of the Hungarian economy in the last three years (*Table 3*).

Table 3.
Impact of the easing cycle on inflation and GDP level¹¹

Period	Inflation (percentage point)	GDP level (per cent)	Contribution of domestic demand to GDP	Contribution of net export to GDP
2013	0.4	0.5	0.1	0.4
2014	1.1	1.1	0.5	0.6
2015	1.6	1.4	0.9	0.5

Source: MNB calculation

6. Conclusion

The Magyar Nemzeti Bank's three-year easing cycle has decreased the rate of undershooting the central bank inflation target and contributed materially to elevating the level of economic output, primarily through the interest rate channel and exchange rate channel of the monetary policy transmission mechanism. Of these two channels, the relative role of the interest rate channel may have grown after the forint conversion of foreign currency household mortgage loans, and thus the conversion may have reinforced the impact of monetary policy looking forward.

Interest rate cuts fed through gradually to short-term money market yields, which moved closely with the declining base rate during the cycle. The base rate cuts significantly reduced corporate and household interest burdens through lower bank interest rates on loans, while lower government securities yields allowed substantial interest savings for the general government.

According to the Magyar Nemzeti Bank's most recent forecast (June 2015), price stability can be achieved in the medium term with persistently loose monetary conditions. A degree of slack continues to prevail in the economy and the inflationary environment is likely to remain low for a sustained period. Based on the expected measures to be taken by the central banks of advanced economies (USA, euro area, Japan) and the region, a low interest rate environment is expected to persist at the international level, which promotes maintaining the low interest rate level currently prevailing in Hungary. A potential future deterioration in global

¹¹ Average impact calculated for each period. We quantified the macroeconomic impacts of the easing cycle using our current forecasting model (the Monetary Policy Model). This model incorporates and compresses the different expert inputs and illustrates the main channels of monetary policy transmission. At the same time, the model, like any economic model alone, only capable of illustrating a simplified form of reality and can only be interpreted with a certain degree of parameter uncertainty. Parameter uncertainty in this case is primarily linked to the key parameters of the transmission channels shown in the model, the values of which we set using a 90 per cent confidence interval based on the model's past data to obtain the uncertainty stemming from point estimates. Based on this, by the end of the estimation horizon (2015), the model's parameter uncertainty gives rise to a ± 0.3 – 0.4 percentage point range for the impact applying to inflation and output levels compared to the point estimate included in the table.

money market sentiment could also affect Hungary's risk perception adversely, but if the country's risk perception does not deteriorate markedly, it could maintain the low level of interest rates for a sustained period.

The Funding for Growth Scheme and the FGS+ managed to halt the shrinking volume of corporate credit and created credit conditions improving enterprises' investment appetite in the recent period. Looking forward, these programmes may provide further incentive for economic agents to reduce their risk aversion, which increased significantly during the financial crisis, and for the easing of credit terms, thereby restoring lending activity and allowing it to continue with healthier dynamics. The forint conversion of foreign currency-based household mortgages and the lower dependency on external funding thanks to the central bank's self-financing programme have decreased Hungary's external vulnerability. In addition, these credit schemes, forint conversion and the transformation of the set of monetary policy instruments are also expected to improve monetary policy transmission.

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