

Pál Péter Kolozsi – Mihály Hoffmann

# *Reduction of External Vulnerability with Monetary Policy Tools*

## *Renewal of the monetary policy instruments of the National Bank of Hungary (2014–2016)*

**SUMMARY:** The outbreak of the economic crisis in 2007–2008 changed the views about economic policy worldwide, in particular, the role, tasks and responsibility of monetary policy. Hungary was hit by the crisis in a particularly vulnerable state; therefore the aim of reducing external vulnerability was a central element of the transformation of economic policy. The Self-Financing Programme announced in 2014 by the National Bank of Hungary (MNB) served this particular objective by facilitating the reform of the central bank toolkit – in accordance with the authorisation received and the provisions set out in the MNB Act – the strengthening of financial stability and the reduction of external vulnerability. This study presents the transformation of the central bank toolkit and the benefits of the different measures, using the Mandl–Dierx–Ilzkovitz conceptual model. The conclusion drawn from the analysis is that the programme proved efficient in the technical and operative sense: indeed, starting from the spring of 2014, the debt management agency refinanced foreign currency debts borrowed from the market with forint issues, while banks' portfolio of collateral securities increased and the central bank's sterilisation portfolio diminished. The programme achieved its macroeconomic goals as well, as the foreign currency ratio of external funding and public debt has decreased and monetary conditions have eased, while the monetary transmission remained intact. In accordance with the announced actions of the MNB and the effective financing plan, self-financing will continue in 2016 as well.

**KEYWORDS:** monetary policy, monetary policy instruments, external vulnerability

**JEL CODES:** E52, E58, H63, G21

The purpose of the monetary policy instruments used by central banks is to ensure the efficiency and effectiveness of monetary policy decisions. In the period preceding the outbreak of the economic crisis in 2007–2008 this meant that monetary policy implementation primarily focused on ensuring the transmission of monetary policy, i.e. that money market yields are adjusted to and aligned with

the key policy rate. Financial markets operated adequately with sufficient liquidity, which meant that the monetary policy toolkit essentially performed a technical function.<sup>1</sup>

The crisis and the management of the crisis, however, shed new light both on monetary policy as a whole and on monetary implementation.<sup>2</sup> The crisis overrode the previous consensus of monetary policy.<sup>3</sup> It demonstrated that price stability and financial stability are not synonymous, that flexible inflation target-

*E-mail address:* kolozsip@mbn.hu

ing does not necessarily create a solid monetary framework, that zero lower bound (ZLB) can be an important monetary policy problem, and that monetary and fiscal policy need to be managed in a coordinated manner even in the short and medium term. Apart from the prevention of excessive risk taking and ensuring transparency, it is also in the interest of the national economy – and at the same time, a public duty – to ensure that the banking system fulfils its fundamental social role, i.e. it transfers savings to investors and manages the risks arising, while keeping transaction costs low. As a result, central bank strategies after the crisis often broke away from the “one objective – one instrument” approach, and recommend the application of a variety of potential tools in a complementary manner or even jointly.<sup>4</sup>

As regards central bank implementation, it was an important recognition that the relationship between the operative goal and the different money market yields that determine monetary conditions and the relevant financial volumes is not stable, which logically led to the dismissal of the previous “monetary macroeconomy versus monetary policy implementation” dichotomy.<sup>5</sup> As markets are inefficient with opportunities for arbitrage and transmission is ineffective, while markets tend to face persistent liquidity problems, short-term yields – influenced by monetary policy primarily through classic tools – are not necessarily reflected in other market segments. All this means that the operation of monetary policy instruments is no longer a technical task, as the efficiency and effectiveness of monetary policy as a whole are determined by the tools applied by the central bank to achieve the pre-defined objectives. According to *Bindseil* (2014), in such turbulent periods monetary policy implementation becomes an “art”.

The design and application of central bank instruments are determined – apart from

the theoretical foundations outlined above – primarily by the objectives laid down in the MNB Act; accordingly, the main contours of the monetary policy toolkit of the MNB are determined by the Hungarian legal environment<sup>6</sup>. Although the objectives set out in the MNB Act are stable, economic and institutional features may change; hence the monetary policy toolkit also needs to be continuously adapted to the changing environment. The global financial crisis opened a new era in this regard as well, as central banks should increasingly focus on various other objectives without jeopardising the price stability target, and due to the deteriorating efficiency of the previously applied transmission channels they should do all – or at least a part – of this with non-conventional (or non-traditional) central bank instruments.

The Self-Financing Programme announced by the MNB in 2014 – which constitutes the focus of this study – is also adjusted to this framework. Concentrating on one of the major structural weaknesses of the Hungarian economy, the programme is intended to eliminate the reliance of the Hungarian economy on external resources and to improve the structure of the economy in general and the financing structure of public debt in particular, thereby contributing to maintaining and strengthening the stability of the financial intermediary system, while achieving and maintaining price stability remain the primary objective of the central bank.

This study discusses the MNB’s Self-Financing Programme and the transformation of central bank instruments in the context of the programme.<sup>7</sup> The declared objective of this article is to examine the macroeconomic effects of the programme, specifically, its effect on financial stability and monetary policy and therefore, it is not intended to present the potential effects of the instruments adopted on the central bank’s result or the relevant risks.

As the effects are diverse and complex and they may materialise separated in time, and the expenses and benefits may not necessarily affect the same economic agent or the same macroeconomic sector, any in-depth analysis and evaluation of potential costs and risks would exceed the limits of this study. These issues may constitute the subject of separate research.<sup>8</sup> This study accepts the conclusions of *Nagy* (2015), according to which the risk-benefit analysis of the different steps should be carried out in a complex manner, taking into account their contribution to the programme as a whole, and that the benefits of the Self-Financing Programme prevail at the macroeconomic level and exceed the quantifiable costs incurred by the central bank, while the risks showing at the central bank level are also offset by the contraction of the MNB's balance sheet.

The structure of the study is as follows. Chapter 1 describes why the reduction of external vulnerability is a relevant economic policy goal, and how this is adjusted to the central bank's mandate and the possibilities offered by the central bank toolkit. Chapter 2 describes the decisions related to the reform of central bank instruments in the period of 2014–2016. Chapter 3 summarises the effects of the programme using the Mandl–Dierx–Ilzkovitz conceptual model. Finally, conclusions are drawn.

## CENTRAL BANK INSTRUMENTS AND EXTERNAL VULNERABILITY

### The significance of external vulnerability<sup>9</sup>

External vulnerability (external exposure) may be defined as excessive reliance on savings denominated in currencies other than the national currency, which poses a real and relevant economic policy problem primarily

when the share of foreign investors persistently dominates the funding structure of the economy, and reliance on external liabilities becomes excessive. It is the main drawback of external exposure that in times of crisis it poses a severe rollover risk, and – as external debt is often denominated in currencies other than the national currency – the reliance of the economy on foreign currency liquidity may increase significantly. Reliance on external savings and foreign exchange markets intensifies the volatility of exchange rates and interest rate spreads, which may undermine the opportunities of the economy to raise funds when a crisis materialises.

In crisis periods with severe market turbulences, the risks arising from the reliance on foreign markets may exacerbate as a result of adverse changes in exchange rates and interest rate spreads, or even due to the deterioration of market perception. As regards indebtedness to foreign markets, short-term liabilities carry special risks, as in periods of crisis the refinancing of such debt poses the first difficulty. Economies with capital shortfall often experience a natural need to raise foreign funds when domestic savings are insufficient, especially when they can be obtained on more favourable terms than domestic funds denominated in the national currency. Cheaper funds, however, entail a greater potential outflow of revenues which, when coupled with extreme exchange rate fluctuations and volatile interest rate spreads, may lead to a downturn in economic performance.

There is no one single indicator of external vulnerability in the literature: it is typically measured by the different indebtedness ratios relative to GDP or to the foreign exchange reserves, by index numbers showing the currency structure of debt, by the size of export revenues serving as the source of the repayment of the debt, by the trade balance, or by indicators calculated from foreign direct investment in-

flows (IMF, 2012; Supriyadi, 2014). There are three important factors identified in the literature as safeguards against external vulnerability: the export-led economic growth potential inherent in the private economy, the size and liquidity of the domestic bond markets, and the foreign exchange reserves (Dyson, 2014). Of these factors, the central banks relevant for this study are traditionally able to directly influence the size of the foreign exchange reserves, but indirectly they may exert influence over bond markets as well, partly by determining the range of eligible securities required as collateral in the case of traditional credit tenders, partly and potentially by participating directly or indirectly as a player in these markets, or by applying other non-conventional instruments.<sup>10</sup>

As in most countries, the management of international reserves is a central bank task, and the primary safeguard for central banks against external economic shocks is the adequacy of the foreign exchange reserves backing short-term external debts. One can measure this using the Guidotti–Greenspan ratio, which relates short-term external debt to the size of the foreign exchange reserves, and regards the reserves as adequate if the ratio reaches the 100 per cent level (Palotai, 2014; Csávás, 2015). In accordance with international trends, the foreign exchange reserve strategy of the National Bank of Hungary also features the Guidotti–Greenspan ratio as the primary indicator (Nagy and Palotai, 2014).

### External vulnerability and the central bank mandate

Act CXXXIX of 2013 on the Magyar Nemzeti Bank provides that:

*Article 3 (1) The primary objective of the MNB shall be to achieve and maintain price stability.*

*(2) Without prejudice to its primary objective, the MNB shall support the maintenance of the stability of the system of financial intermediation, the enhancement of its resilience, its sustainable contribution to economic growth; furthermore, the MNB shall support the economic policy of the government using the instruments at its disposal.*

In accordance with the central bank mandate and the inflation targeting system applied by the MNB, the primary objective of the MNB is to achieve the inflation target embodying price stability. This, however, is supplemented by additional objectives. These additional objectives are also statutory obligations, which means that the central bank should also bear these objectives in mind and use the instruments at its disposal to facilitate their achievement, provided that they are not contrary to the primary objective.

As regards the other objectives laid down in the MNB Act, specifically, financial stability, and the support of the economic policy of the Government, upon the announcement of the Self-Financing Programme in April 2014, the National Bank of Hungary defined the reduction of external vulnerability as the objective to be achieved (MNB, 2014). Accordingly, below we examine:

- (a) whether the reduction of external vulnerability defined as the objective of the programme promotes financial stability,
- (b) whether such an objective is consistent with the economic policy goals of the Government,
- (c) whether external vulnerability may be reduced by central bank instruments, and
- (d) how all this relates to the primary objective of the central bank.

### ***Relevance of the external vulnerability problem for Hungary***

Relatively developed countries have significant net and gross external debt in interna-

tional comparison, and there is a particularly sharp boundary in Europe as well between new (or prospective) and the old EU Member States in this regard. The gross external debt-to-GDP ratio of old EU Member States is typically 100–400 per cent, whereas that of the emerging economies of the CEE region is around 100 per cent. Nevertheless, this does not mean that risks are distributed accordingly; in the case of stable states holding reserve currencies (for example euro area Member States, the United Kingdom) the high value does not imply a substantial risk, while in the case of small and open emerging (developing) economies even a lower value impairs market perception.

The CEE region is of primary relevance for Hungary, and in the years following the crisis, Hungary found itself in a worse situation than most of its peers: in 2013 – before the announcement of the Self-Financing Programme

–, both its net and gross external debt exceeded the corresponding values of most countries in the region, and took similar values than those recorded in explicitly high-risk Southern European countries (see Figure 1). Prior to the commencement of the Self-Financing Programme, i.e. the renewal of central bank instruments, Hungary was counted among vulnerable countries in terms of external vulnerability even by international standards<sup>11</sup>.

In Hungary, the significant growth of indebtedness to foreign countries was partly driven – beside the proliferation of foreign currency lending to households<sup>12</sup> – by sovereign borrowing starting from the mid-2000s. While less than 50 per cent of gross public debt was financed by foreign creditors at the beginning of 2008, by 2012 this value rose to almost 70 per cent. It also indicates substantial external vulnerability that, according to *Moody's* (2015)<sup>13</sup>, in 2014 only Peru and Indo-

Figure 1

**NET AND GROSS EXTERNAL DEBT IN EUROPEAN UNION MEMBER STATES (2013)**



Source: European Central Bank

nesia recorded a higher share of non-residents in total debt than Hungary.

The funding structure was also unhealthy from the aspect that the Hungarian economy excessively relied on foreign currency funds. In 2013, the last year before the Self-Financing Programme, the ratio of foreign currency debt to total Hungarian public debt exceeded 40 per cent, whereas in the European Union only four countries recorded higher corresponding values. Importantly, of these four countries Bulgaria maintains a currency board system, which means that, for practical purposes, it does not face any exchange rate risk, and Lithuania's subsequent accession to the euro area practically eliminated its exposure to exchange rate risk.

The relevance of the problem is demonstrated by the fact that numerous investor analyses and country reports on Hungary

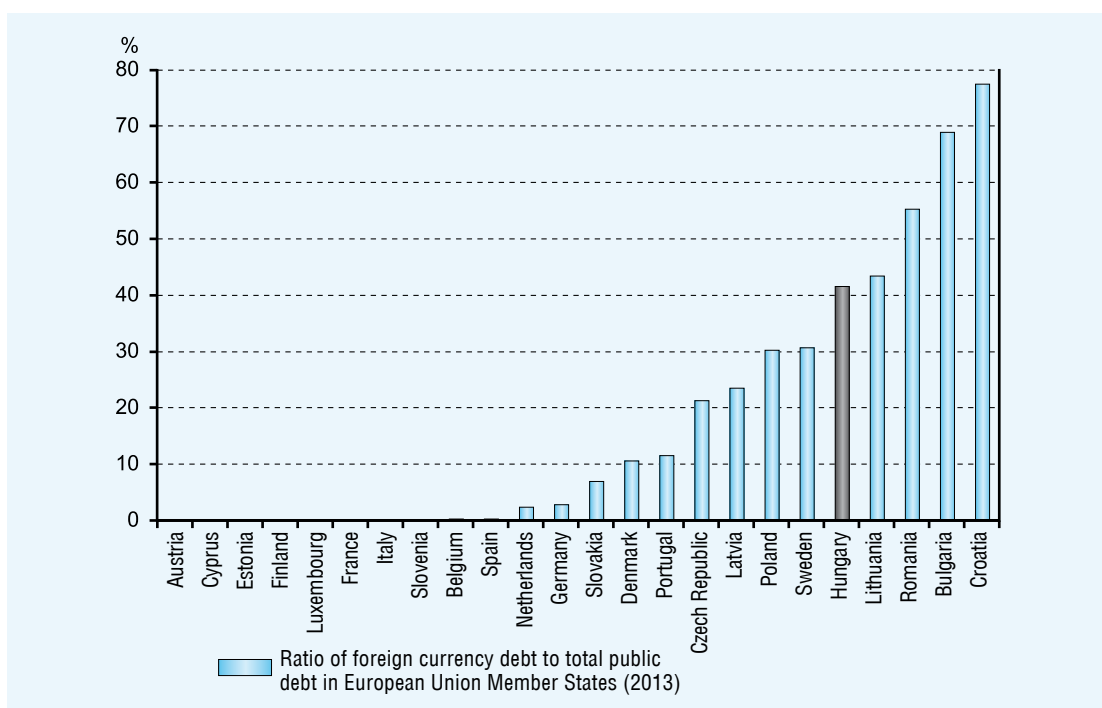
identified high exposure to foreign investors as a key risk and a problem to be addressed.<sup>14</sup> External vulnerability became an acute economic policy problem of Hungary after the crisis, the reduction of which was regarded as a relevant economic policy objective.

High external vulnerability poses a risk per definitionem to financial stability; therefore, its reduction is consistent with this central bank mandate. The reduction of vulnerability is a justifiable economic policy objective of the Government also because Hungary's convergence programme for 2013 declares that the reduction of high external debt – which was one of the major factors behind the financial vulnerability of Hungary – is one of the four key economic policy objectives.<sup>15</sup>

The question may arise, however, how all this suits the primary objective of the central

Figure 2

**RATIO OF FOREIGN CURRENCY DEBT TO TOTAL PUBLIC DEBT IN EUROPEAN UNION MEMBER STATES (2013)**



Source: EUROSTAT, Government finance and EDP statistics database

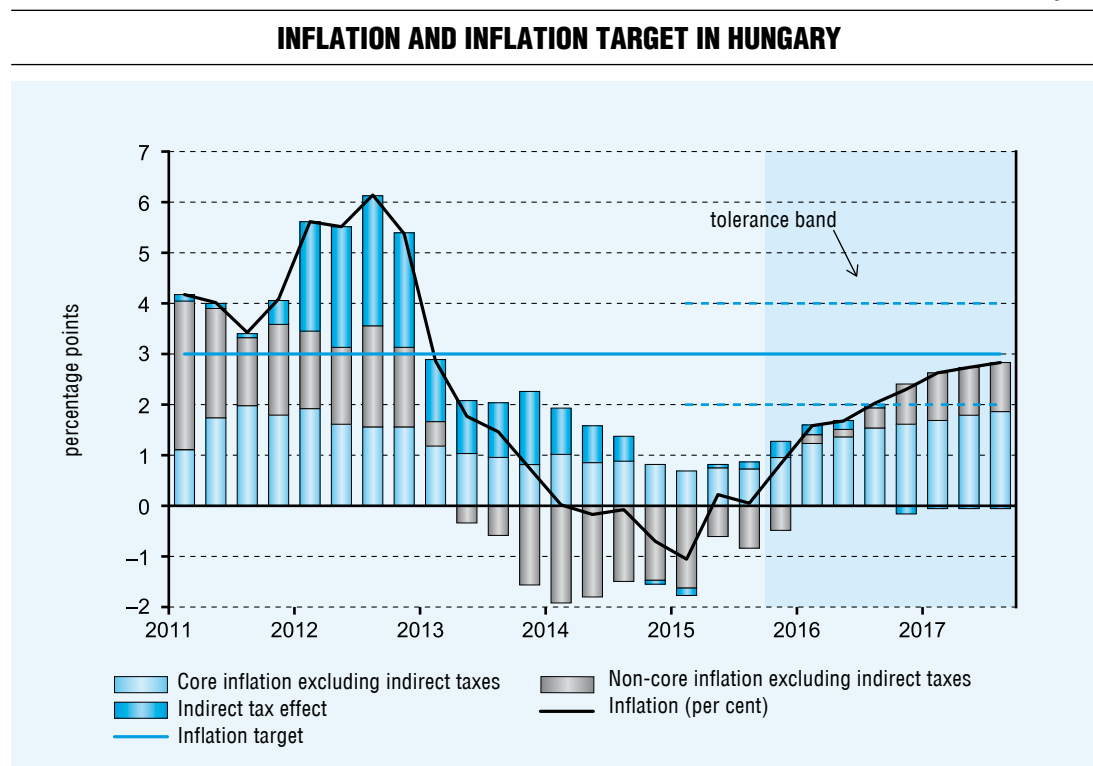
bank. As there is no logical connection offering itself automatically here, the specific period and programme need to be evaluated. It is an important circumstance that in the years of crisis management – following 2010, but particularly after 2013 – the Hungarian central bank faced a persistently low inflation environment (see Figure 2), as a result of which, and with a view for achieving its inflation target, it commenced a policy of monetary easing. This materialised primarily in the central bank’s easing cycles (compared to 7 per cent in mid-2012, by end-2015 the central bank base rate fell to 1.35 per cent),<sup>16</sup> but non-traditional central bank instruments also had a pronounced role in the easing of monetary conditions.<sup>17</sup> Accordingly, any non-conventional steps that implied a reduction of yields, i.e. monetary easing, also supported the achievement of the price stability objec-

tive amid the subdued inflation environment. As will be shown later, the Self-Financing Programme in the centre of this study may be regarded as such a step (see Figure 3).

**Correlations between external vulnerability and monetary policy instruments**

Among the aforementioned indicators of external vulnerability, external debt ratios have key importance for Hungary. External exposure is best captured by net external debt; however, its changes depend on the country’s current account and capital account;<sup>18</sup> in other words, they arise from macroeconomic developments, and thus they can only be shaped at substantial real economy costs. Lowering the gross elements of net external debt, however, may also reduce external vulnerability, as the rollover risk stemming from gross debt is lower, whereas due to the fact that the level of

Figure 3



Source: MNB, Inflation Report, December 2015



net debt remains the same, there is no need to expect real economy adjustment or costs. As regards a government economic policy programme, in terms of gross external debt it is changes in gross external public debt that have special significance, given that a government programme can exert the greatest and most direct impact on this factor.

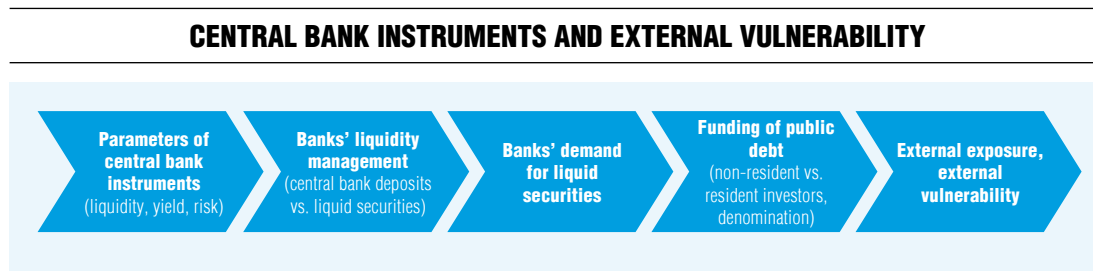
This is the reason why, according to the “self-financing concept”, external vulnerability should be mitigated by the reduction of gross external debt,<sup>19</sup> which should be carried out by moving in the direction of government forint financing. The reduction of gross external debt will result from the funding of public debt from internal resources – which can be achieved by restraining foreign currency issuance by the state, refinancing maturing foreign currency debt with forint issues, and by shifting toward the issuance of forint-denominated government securities (negative net foreign currency issuance). Although self-financing does not directly influence external debt, as the majority of foreign currency debt is owed to foreign investors, the reduction of foreign currency financing eventually lowers external debt. Shifting toward HUF financing will improve the currency composition of public debt and reduce the sensitivity of debt to foreign exchange rate changes, which means, as an added benefit, that the exchange rate fluctuations of the forint will be reflected in debt ratios to a lesser degree.

Although the Self-Financing Programme – launched by the MNB with a view to facilitating the success of self-financing – is closely connected to the self-financing concept in that it assumes cooperation between banks, the manager of public debt and the central bank, it is separated from it at a conceptual level. The central bank’s programme is an integral part of the concept, and is based on the assumption that the above-described goals of self-financing may be achieved if the conditions of central bank instruments are modified. This assumes the existence of a relationship between central bank instruments and external vulnerability (*see Figure 4*).

The diagram below shows the logical connections through which the terms and conditions of deposit and credit transactions between the central bank and commercial banks (central bank counterparties) influence banks’ liquidity management and ultimately, indebtedness and external vulnerability in economies characterised by structural liquidity surplus, such as Hungary<sup>20</sup>.

In accordance with the schematic and simplified correlations of Figure 4, banks may manage their liquidity in two ways: using either the central bank’s deposit facility or central bank loans backed by liquid securities. The relative features of the central bank’s deposit and credit products will determine the extent to which the banks will choose one or the other option. Assuming that the yield on the cen-

Figure 4



Source: authors' own editing



tral bank's main sterilisation instrument is the base rate – which is reflected in money market yields – and that central bank deposits in the national currency practically imply risk-free investment, liquidity remains the only variable that influences the banks' decisions. Therefore, to simplify matters, if the central bank's deposit facilities are of high liquidity, banks will consider them preferable to liquid securities; in other words, banks will keep their liquidity surplus in central bank deposits. This is consistent with foreign investors having a dominant role in the financing of the public debt (relative to a situation where the liquidity of central bank instruments is worse), and this may raise the level of the foreign currency ratio. Thus, overall, central bank deposit products with favourable liquidity features might distort banks' liquidity management with insufficient reliance on liquid securities<sup>21</sup>, and *ceteris paribus* may, albeit implicitly, increase external vulnerability. It is also important to note that if exposure to foreign investors entails increased foreign currency issuance, the balance sheet of the central bank may also expand which, due to the costs of central bank sterilisation, would also imply costs at the level of the national economy.

### TRANSFORMATION OF THE MNB'S MONETARY POLICY INSTRUMENTS IN 2014–2016

Based on the above we may conclude that external vulnerability posed a relevant economic policy challenge at the beginning of the decade in Hungary; its reduction was consistent with the central bank's mandate and the MNB Act and, due to the correlations between central bank instruments and external vulnerability, the central bank indeed was in the position to facilitate the reduction of external exposure.

Consequently, through the transformation of its monetary policy instruments the MNB

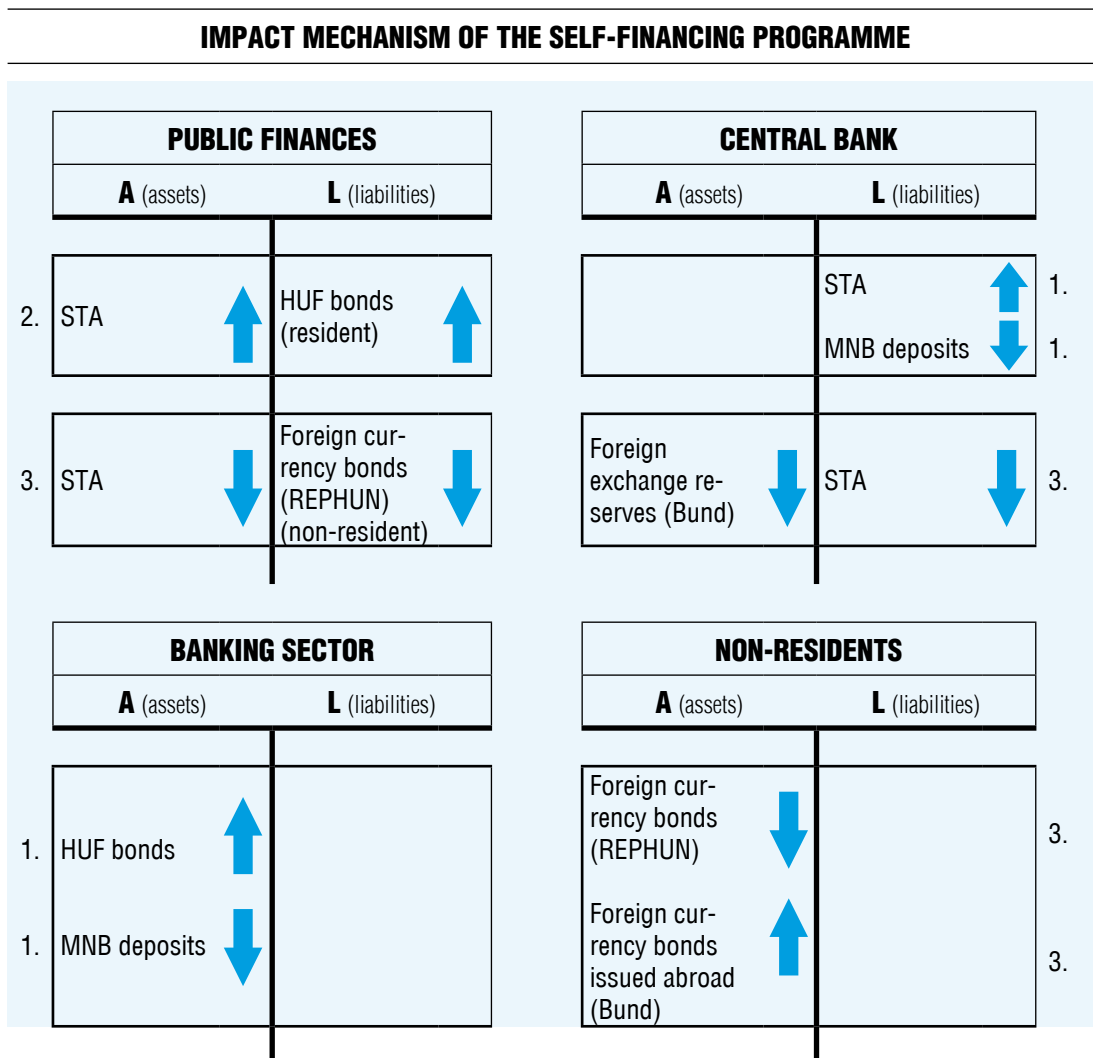
could reasonably expect to achieve the objective of increasing – from a bank and liquidity management perspective – the appeal of eligible non-central-bank securities by making central bank instruments less attractive.<sup>22</sup> The Self-Financing Programme of the MNB is built on the following impact mechanism (*see Figure 5*).

① The modification (impairment) of the liquidity profile of central bank instruments prompts banks to shift toward liquid securities that are more favourable from the aspect of liquidity. As due to the peculiarities of the Hungarian securities market Hungarian government securities dominate the range of liquid securities eligible as collateral for the purposes of central bank operations, the restructuring primarily affects the government securities market (*see Figure 5*: a rise in HUF bonds generates a decline in MNB deposits on the asset side of the balance sheet of the banking system, a decline in the MNB deposits comprising the sterilisation portfolio on the liability side of the central bank<sup>23</sup>, and an increase in the Single Treasury Account [STA]).

② Taking advantage of the surplus demand generated by the impact mechanism described above, the Hungarian state will refinance maturing foreign currency debt in forint, i.e. it will issue additional forint-denominated bonds in a quantity corresponding to the maturing debt (which generates an increase in bonds on the liability side of the balance sheet of public finances, and a simultaneous increase in the balance of the Single Treasury Account on the asset side).

③ Upon the maturity of foreign currency assets, the government will convert the additional forint issue of the central bank into foreign currency, then repay the foreign currency to non-resident investors (with the conversion generating a decline in STA and the foreign exchange reserves on the central bank's balance sheet, the repayment generating a decline

Figure 5



Source: authors' own editing

in STA and the foreign currency bond debt of public finances, and as regards non-residents, Hungarian foreign currency bonds will be replaced by foreign currency instruments issued by non-residents).

Through the effect mechanisms described above, the changes implemented under the Self-Financing Programme contributed to the mitigation of external vulnerability as the modification of the liquidity profile of central bank deposit instruments ultimately lead to the reduction of foreign currency debt and external debt<sup>24,25</sup>.

### Steps of the Self-Financing Programme

The Self-Financing Programme may be divided into three phases. Commenced in the summer of 2014, in the first phase<sup>26</sup> of the programme the two-week MNB bill (main policy instrument) was replaced by a deposit, and the MNB announced the introduction of an interest rate swap instrument (IRS). The second phase of the programme was announced by the MNB on 2 June 2015, when the maturity of the main policy instrument was extended to September 2015 and the available volume

of the two-week deposit instrument was gradually reduced.<sup>27</sup> Subsequently, the conditions of the central bank's interest rate swaps were made more flexible, and the terms applicable to the interest rate corridor and collateralised credit instruments were modified. It is also related indirectly to the Self-Financing Programme that in the context of the European Union harmonisation, the MNB brought the minimum reserve system more in line with the practice of the European Central Bank, which had an impact on banks' liquidity management, the appeal of central bank instruments and hence, the demand for non-central bank issued, eligible collateral, including, in particular, government securities. The third and closing phase of the programme involves the complete phase-out of the two-week deposit product, which is to be implemented in April 2016 (see Table 1).

## EFFECT OF THE SELF-FINANCING PROGRAMME

Integrating the steps of the Self-Financing Programme into the conceptual model of Mandl–Dierx–Ilzkovitz (2008), the following structure will arise (see Figure 6).

The model distinguishes between effects that are more technical in nature and materialise in the short term (*output*), and effects manifested in the longer term that can be also interpreted at the macroeconomic level (*outcome*). Based on the conceptual pattern outlined above, it is possible to evaluate the operative and technical efficiency, as well as the benefits achieved by the changes implemented in the central bank's instruments in the context of the Self-Financing Programme, ultimately facilitating the achievement of price stability, the stability of the financial system and sustainable economic growth.<sup>38</sup>

Table 1

### STEPS OF THE RENEWAL OF CENTRAL BANK INSTRUMENTS IN RELATION TO THE SELF-FINANCING PROGRAMME

Affected instrument	Change	Link to the Self-Financing Programme
Main policy instrument <sup>28</sup>	Two-week bill is replaced by three-month deposit	In August 2014, the two-week bills issued by the MNB were replaced by a two-week deposit facility, <sup>29</sup> and as of September 2015, the maturity of the main policy instrument was extended to three months. <sup>30</sup> The transformations were intended to reduce the appeal of the main central bank sterilisation instrument, which increases the demand for non-central bank, eligible securities.
Interest rate corridor <sup>31</sup>	Symmetric corridor is replaced by asymmetric corridor	The previous $\pm 100$ bps interest rate corridor around the base rate was rendered asymmetric by the MNB in September 2015. As a result, the interest rate on the overnight (O/N) deposit facility deviates by $-125$ bps, while the interest rate on the overnight (O/N) collateralised loan deviates by $+75$ bps from the central bank base rate. The purpose of the measure was to reduce the appeal of the O/N deposit instrument. <sup>32</sup>
Minimum reserve	Optional ratios replaced by a standardised reserve ratio <sup>33</sup>	As of December 2015, the minimum reserve ratio in Hungary is fixed at 2 per cent. Previously credit institutions were free to choose their own reserve ratio within a range of 2 to 5 per cent. By prescribing a fixed reserve ratio, the MNB prevented banks from adjusting to the transforming liquidity environment via the reserve system. <sup>34</sup>

Affected instrument	Change	Link to the Self-Financing Programme
Collateralised loans	Two-week and six-month maturities replaced by one-week and three-month maturities	Starting from September 2015, two-week loans were replaced by one-week loans, whose interest rate fell from base rate +50 bps to base rate +25 bps. The MNB replaced six-month loans with three-month loans, continued to be sold at floating rate tenders. The changes have made collateralised credit instruments more attractive for banks.
Supplementary instrument for the management of forint liquidity	Introduction of restricted two-week deposits	In parallel with the modification of the main policy instrument, between September 2015 and April 2016 the MNB also maintained the two-week deposit product as a tool to assist banks' liquidity management, subject to a quantity limit of HUF 1,000 billion. In the scope of the third phase of the Self-Financing Programme, in April 2016 the MNB is set to phase out the two-week deposit instrument altogether.
Instrument for the management of interest rate risk	Introduction of the conditional interest rate swap instrument	The MNB has held IRS tenders conditional upon securities purchases since June 2014. <sup>35</sup> If a bank shifts its funds from two-week and three-month central bank deposits into securities with maturities of 2 years or longer, its interest rate risk will increase due to the longer maturity. In order to prevent this from impeding banks' adjustment, the MNB added interest rate swaps suitable for the management of interest rate risks <sup>36</sup> to its set of instruments. In summer 2015, the MNB supplemented the initial 3- and 5-year maturities with a 10-year maturity, and in September 2015 it allowed banks to choose between 2014 Q1 and the period of March to May 2015 in respect of the base portfolio against which adequacy is to be checked. <sup>37</sup>

Based on a quantitative and qualitative analysis, below we examine the realisation of the assumed output and outcome effects of the schematic model depicting the Self-Financing Programme framework.

### Operative efficiency of the Self-Financing Programme (output effects)

Inputs of the Self-Financing Programme denote changes in the central bank instruments. For the purposes of this exercise, first-round, operative and technical efficiency indicates whether the steps concerned were capable of establishing the conditions indispensable for the intended social impact, i.e. in this case of restructuring the banks' funds, increasing col-

lateral holdings and contracting the balance sheet of the central bank. Ultimately, this leads back to two basic questions:

① Did the ÁKK succeed in refinancing maturing foreign currency debt by raising forint funds through self-financing?

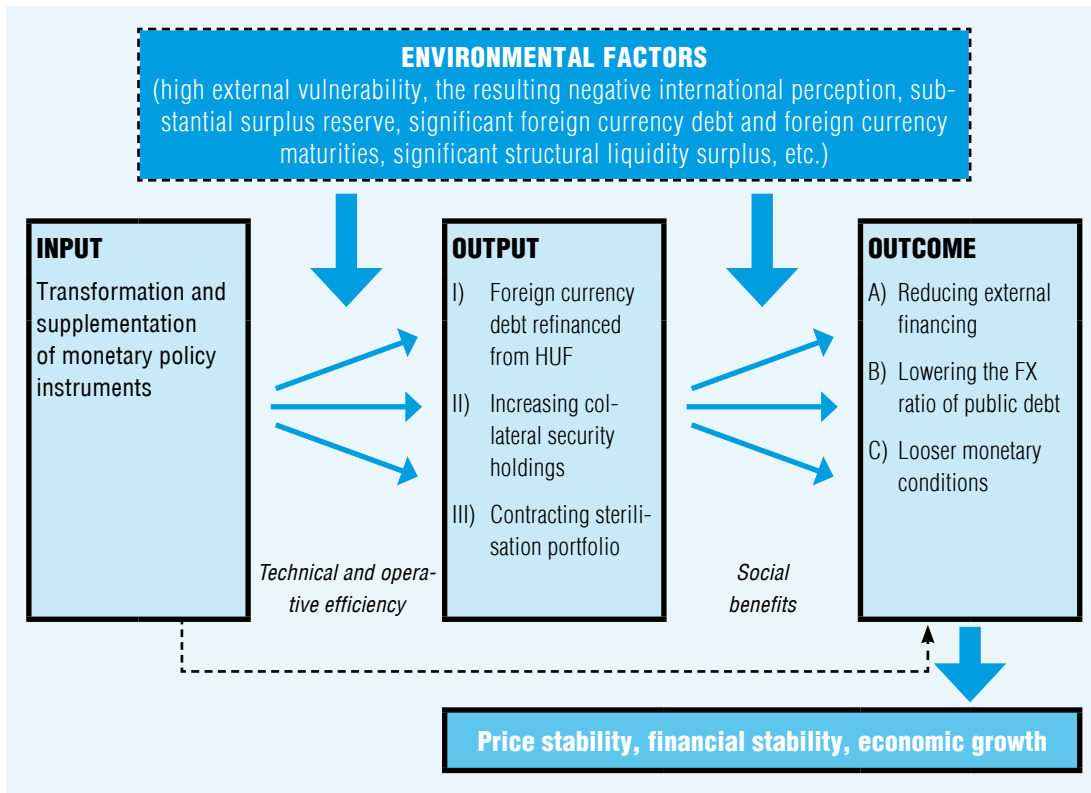
② Did the renewal of central bank instruments prove to be efficient in driving out a part of banks' funds from central bank instruments and channelling the same funds into the market of liquid securities, in particular, government securities?

### *Refinancing foreign currency debt with forint issues*

In respect of the refinancing effect of the self-financing concept, it is reasonable to start from the net foreign currency issuance of the Gov-

Figure 6

**THE SELF-FINANCING PROGRAMME FRAMEWORK**



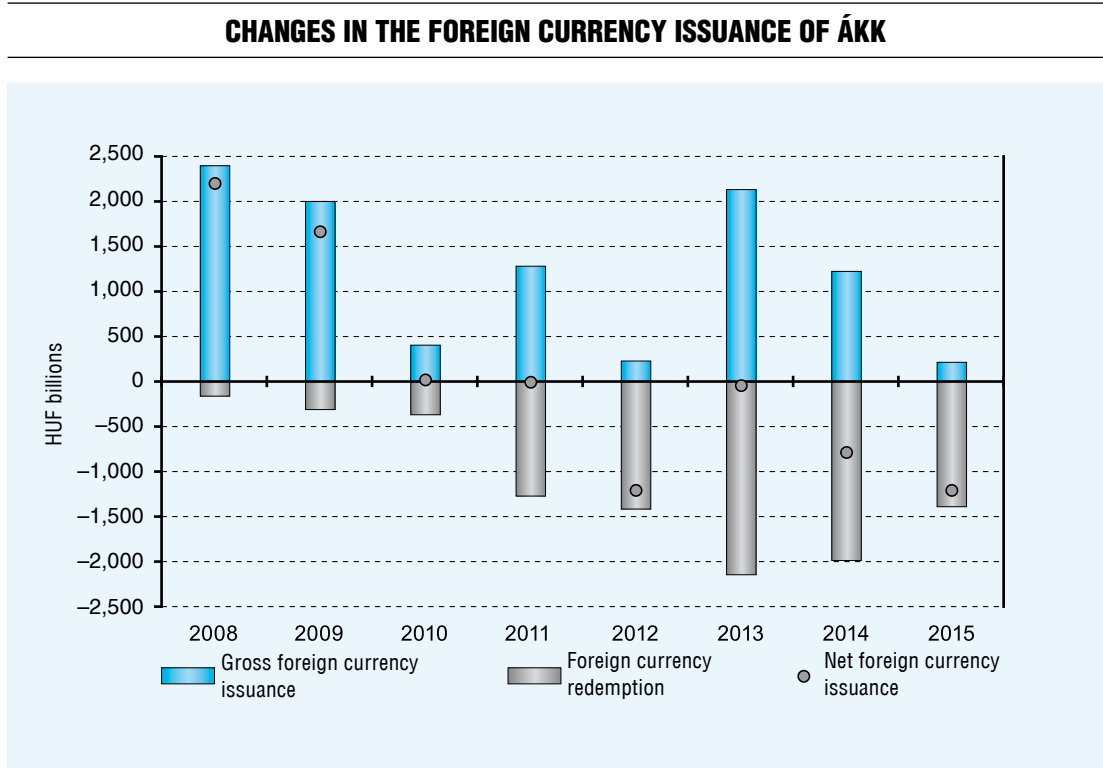
Source: authors' own editing, based on Mandl–Dierx–Ilzkovitz (2008)

ernment Debt Management Agency (ÁKK) (see Figure 7), as this item captures the amount by which foreign currency issuance in the given year exceeded maturing foreign currency debt. In 2014 and 2015 net foreign currency issuance amounted to HUF –766 billion<sup>39</sup> and HUF –1,186 billion, respectively.<sup>40</sup> The total refinancing effect in 2014–2015 is estimated to be HUF 1,952 billion, which means that the Hungarian Government repaid foreign currency debts equivalent to this forint value from the forint funds converted at the MNB (gross foreign currency issuance was not zero even after the spring of 2014 because the Self-Financing Programme did not affect the issue of foreign currency securities for households, i.e. those definitely purchased by resident income earners).

**Increasing collateral security holdings**

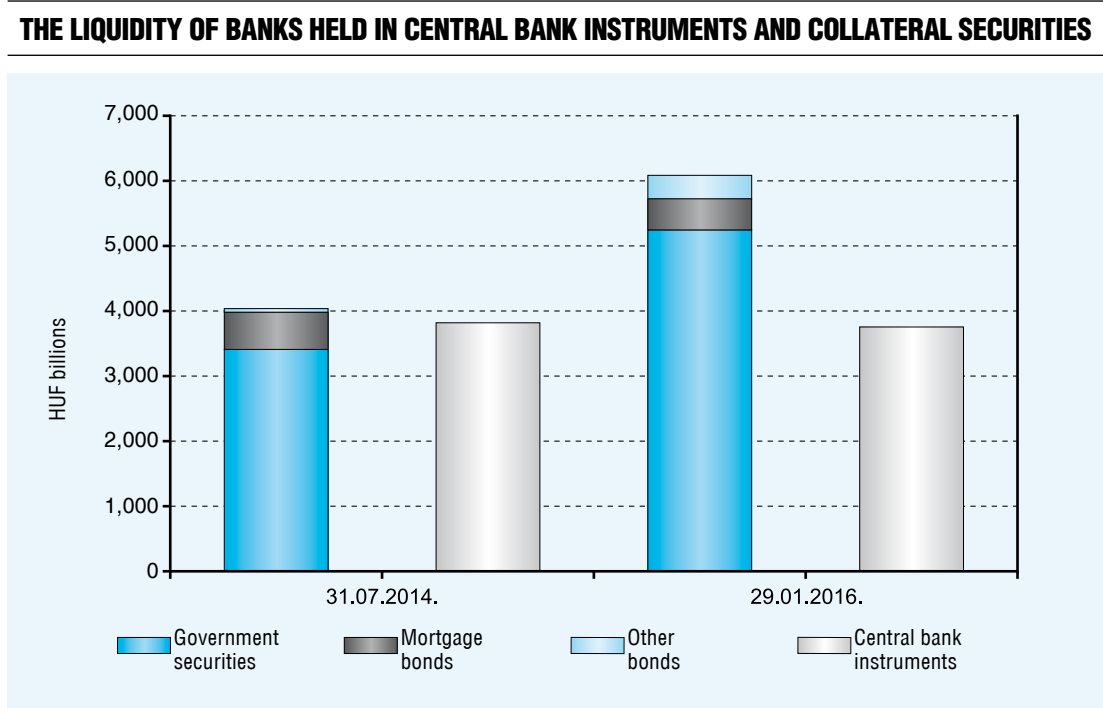
The refinancing of maturing foreign currency public debt with forint issues can only be linked clearly to the Self-Financing Programme if the necessary demand for forint-denominated government securities was provided by the banks. This may be confirmed if the liquidity management of banks is transformed, i.e. if the banks have shifted their liquidity to the government securities market in line with the volume of net foreign currency issuance. Figure 8 confirms this, as it clearly shows that between the summer of 2014 and February 2016 most of the surplus liquidity flowing into the banking system landed in the market of collateral securities, particularly, in the government securities market. Since

Figure 7



Source: MNB

Figure 8



Source: MNB

the impact mechanism of the Self-Financing Programme specifically points in this direction, actual data reconfirm that banks have restructured their liquidity management instruments.

It also shows the impact of the instruments of the Self-Financing Programme that the rise in the central bank's IRS portfolio and the rise in banks' government securities holdings show close co-movement (see Figure 9). It is particularly striking that after the announcement of the launch of the second phase of the programme both IRS use and the government securities portfolio reversed dynamics. The correlation coefficient between the increment of the IRS portfolio and the increment of the government securities portfolio of credit institutions is 0.9875, which means that the increase in the government securities portfolio is almost fully explained by the use of the central

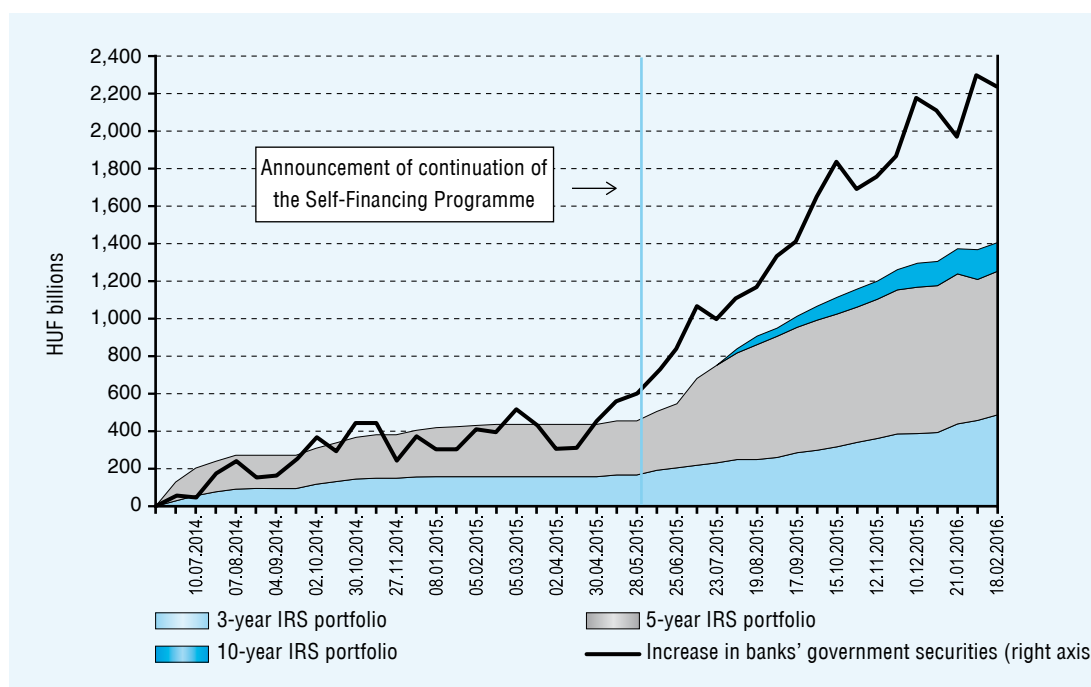
bank's interest rate swap instrument (the Pearson correlation coefficient is 0.9752, which is also outstandingly high). The slope of the linear function between the two variables in the case of a positive axis intercept is 1.756, which means that one unit of IRS allocation generated more than a 1.5 times increase in banks' government securities holdings.

**Contracting sterilisation portfolio**

If the ÁKK refinances maturing foreign currency debt with forints issues, the central bank's balance sheet will contract by definition. As the central bank's cost of funds is higher than the rate of return achieved on the foreign exchange reserves, the contraction of the central bank's balance sheet means interest saving for the MNB. Due to its very nature, the self-financing concept points in the direction of the contraction of the central bank's balance sheet; howev-

Figure 9

**CHANGES IN THE IRS AND GOVERNMENT SECURITIES PORTFOLIOS OF THE BANKING SYSTEM**



Source: MNB



er, since there are numerous factors influencing the balance sheet of the MNB,<sup>41</sup> self-financing alone will not be able to actually contract its balance sheet. Therefore, the balance sheet contraction is measured in this case in terms of the extent to which the ÁKK has redeemed maturing foreign currency debt from forint liabilities; thus, *ceteris paribus* – based on the processes shown of Figure 7 – as a result of self-financing, at the beginning of 2016 the banking portfolio on which the MNB pays sterilisation costs decreased by almost HUF 2,000 billion.<sup>42</sup>

Taken together, we may conclude that the steps affecting the central bank instruments resulted in operative consequences that are consistent with the impact mechanism of the Self-Financing Programme.

### Macroeconomic effect of the Self-Financing Programme (outcome effects)

The declared purpose of the Self-Financing Programme is to reduce the external vulnerability of the national economy; therefore, the success (benefits) of the programme primarily depends on whether the objective described above is achieved or not.

#### *Reducing external financing*

As it has been mentioned earlier, the Self-Financing Programme can only influence gross external debt, as net debt arises from savings developments in the different domestic sectors. Therefore, the benefits of the programme do not primarily mean that net external debt has decreased further since 2014, but that all this has taken place in parallel with a sustainable reduction of gross external debt with a recently unprecedented intensity (the reduction of net debt should be regarded as a consequence of the current account surplus).

As regards public finances, gross external debt relative to GDP (a key indicator for the

Self-Financing Programme) fell from over 53 per cent in 2014 Q2 to around 43 per cent by 2015 Q3 (see Figure 10). In addition to the negative net foreign currency issuance, it may be regarded as a kind of indirect effect of the Self-Financing Programme that the intensifying demand of banks for government securities might have motivated foreign investors to close their government securities positions, and if the government securities were taken over by domestic sectors (the banking sector), this also generated a decline in external debt. Apart from this, other factors might also have influenced the gross external debt of public finances (e.g. the movement of cross rates), but the Self-Financing Programme – due to the impact mechanism described above – was certainly one of the main causes of the decrease.

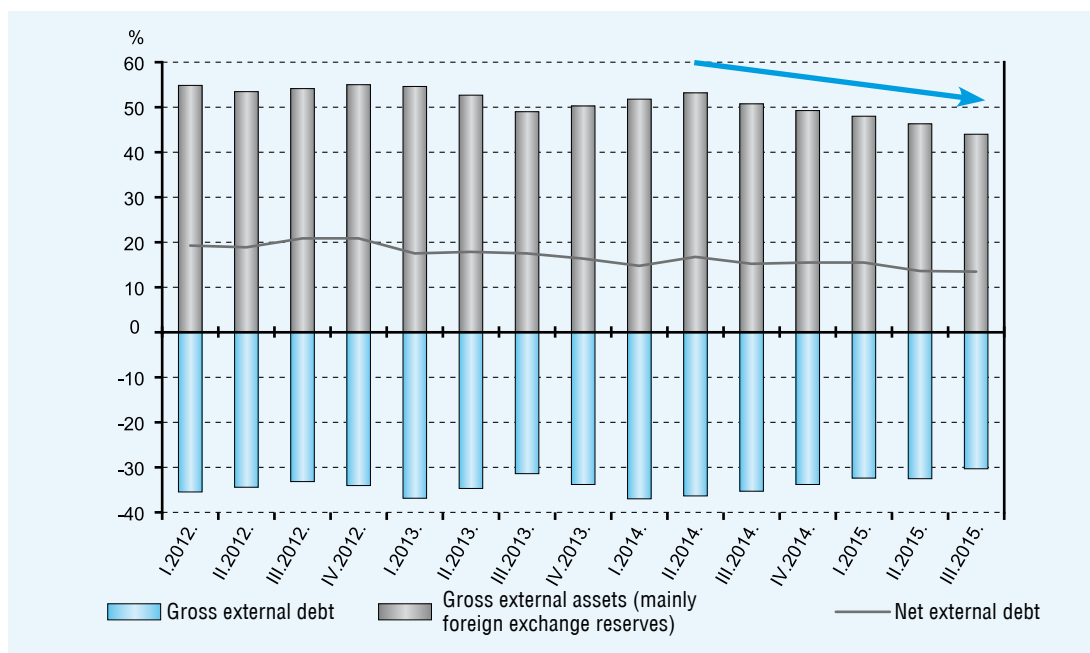
#### *Lowering the FX ratio of public debt*

According to the impact mechanism of the self-financing concept and programme, as a result of the programme, the ratio of foreign currency debt to total public debt should fall significantly, as self-financing means, first and foremost, that foreign currency debt typically held by foreign investors is replaced by forint-denominated debt held by residents (domestic banks). Changes in the foreign currency ratio of public debt confirm the preliminary assumption, as the FX ratio has decreased substantially since the announcement of the Self-Financing Programme. The foreign currency ratio in 2013 was over 40 per cent, and by end-2015 it fell below 33 per cent (see Figure 11).

The foreign currency ratio of public debt had fallen significantly during a short period (2012) even before the announcement of the Self-Financing Programme in 2014. According to Figure 7 that depicts changes in the foreign currency issuance of the ÁKK, 2012 saw an outstanding volume of negative net foreign currency issuance (over HUF 1,000 billion). This means that the ÁKK financed a

Figure 10

**GROSS EXTERNAL DEBT OF PUBLIC FINANCES (AS A PERCENTAGE OF GDP)**

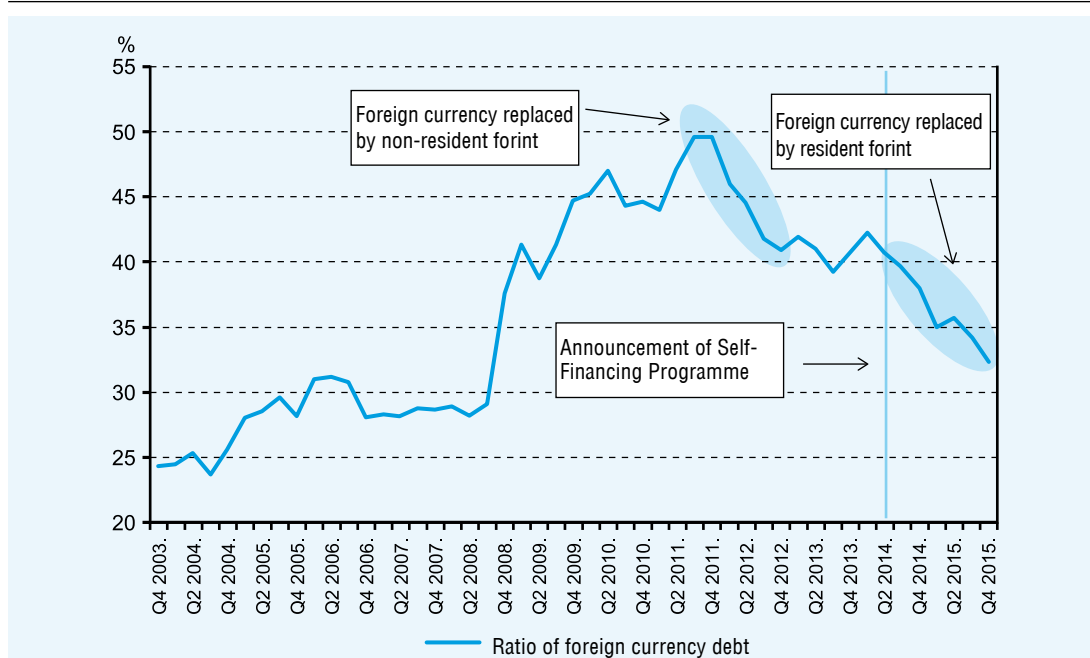


Note: gross external debt adjusted with the margin debts deposited by foreign swap partners, and gross external assets adjusted with margin debt and margin claims.

Source: MNB

Figure 11

**CHANGES IN THE FOREIGN CURRENCY RATIO OF PUBLIC DEBT**



Source: MNB

substantial amount of maturing foreign currency debt with forint issues in 2012. Differences between the two periods can be detected based on changes in the gross external debt of public finances and the foreign exchange reserves (Figure 10): in 2012 gross external debt rose significantly, which means that the stepped up forint issues were purchased by non-resident investors, i.e. foreign currency debt decreased, but external vulnerability declined only in part. On the other hand, in 2014–2015 the foreign currency ratio of public debt and the share of non-resident investors both decreased, which means that external vulnerability declined from the aspect of both key parameters. As a result – in addition to the increase seen in households’ holdings since 2012 –, by end-2015 the Hungarian banking sector became the number one player in the market of forint-denominated government securities, overtaking even non-resident investors that had been dominant since 2011 (see Figure 12).

#### ***Looser monetary conditions***

Due to the low inflation environment, the MNB has endeavoured to ease monetary conditions over the past two years. As the Self-Financing Programme channels banks’ liquidity to liquid securities markets and the resulting surplus demand exerts a downward pressure on yields, the programme may be regarded as an example of monetary easing. Based on the impact mechanism of the Self-Financing Programme, in all likelihood, the transformation of central bank instruments and the resulting boom in banks’ demand for government securities affected not only the size of banks’ government securities portfolio, but market yields as well. According to the regression estimate disclosed by the MNB (2015a), between April 2014 and March 2015, the rate of return on 3-year and 5-year maturities fell by 230 bps and 214 bps, respectively; and about

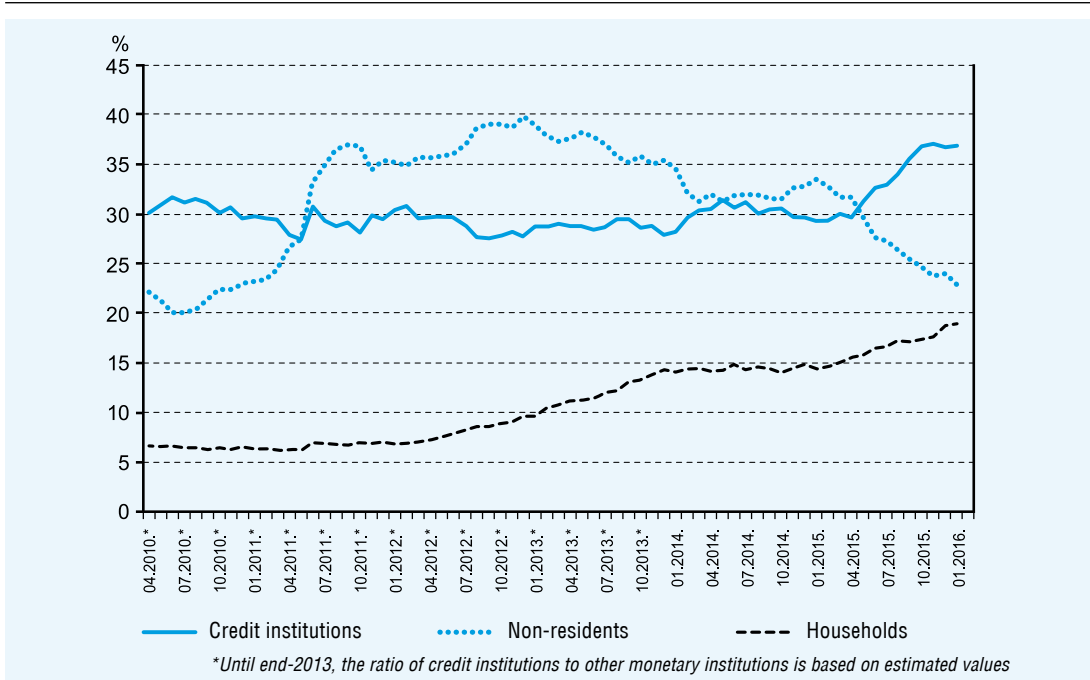
one-third of the total decline was associated, in one some form, with the Self-Financing Programme.

The qualitative analysis of the shifting of the yield curve, however, leads to the conclusion that the Self-Financing Programme reduced longer-term yields substantially (see Figure 13). Between the summer of 2014 and early 2016, the entire Hungarian yield curve shifted downwards, by 100–125 bps in magnitude. Dividing the programme into two parts reveals that in the first year (between June 2014 and June 2015) the reduction of short-term yields was more dynamic, but the longer end of the curve fell to a lesser degree. During this period the MNB’s easing cycle was in progress, which in itself may account for 80 bps of the reduction of short-term yields (the central bank base rate fell from 2.30 per cent to 1.50 per cent in this period). In the second phase, however – between end-June 2015, when the second phase of the Self-Financing Programme was announced, and end-January 2016 –, the decline in yields was limited almost exclusively to longer maturities, while the base rate fell by 15 bps only (from 1.50 per cent to 1.35 per cent). This indicates that the second phase of the Self-Financing Programme, announced in June 2015, had a greater easing effect, which is also supported by the fact that in this phase banks’ government securities purchases were far more intense than in the first year (Figure 9).

It also shows the effect of domestic factors – including the Self-Financing Programme in particular – that Polish yields (that may be regarded as a kind of reference from the Hungarian point of view) decreased much less than Hungarian yields, despite interest rate cuts of a similar order of magnitude (100 bps or 125 bps, respectively). As a result of the difference that can be seen in the dynamics of yield changes, the yield difference of 100–125 bps existing between the two countries in the early spring of 2014 – i.e. immediately before

Figure 12

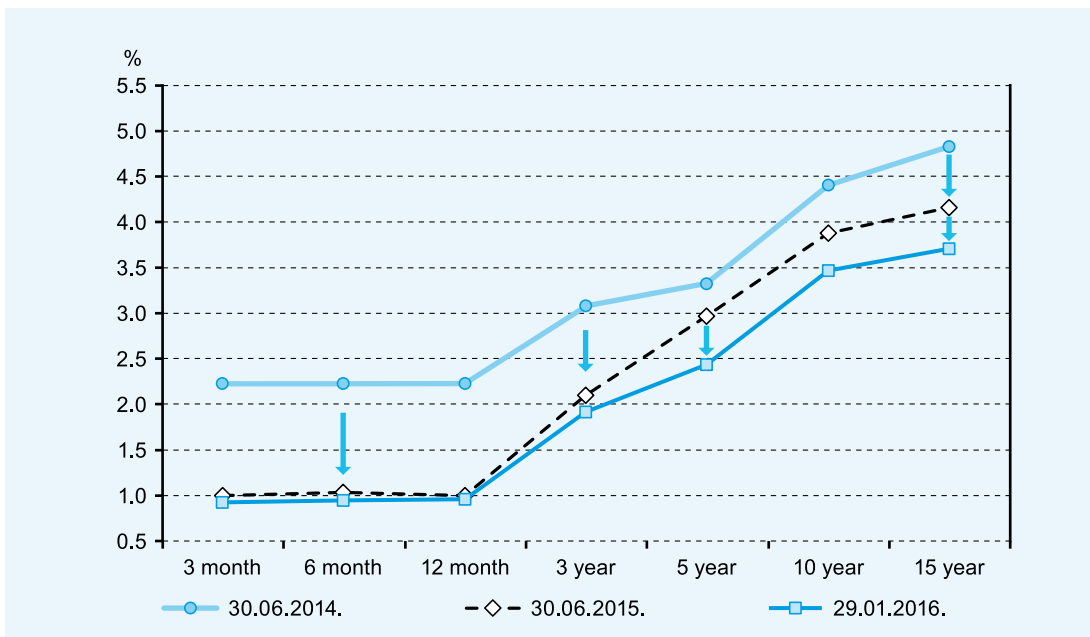
**RATIO OF HOLDER SECTORS TO THE TOTAL FORINT-DENOMINATED GOVERNMENT SECURITIES PORTFOLIO**



Source: MNB

Figure 13

**CHANGES IN THE YIELD CURVE OF GOVERNMENT SECURITIES**



Source: MNB

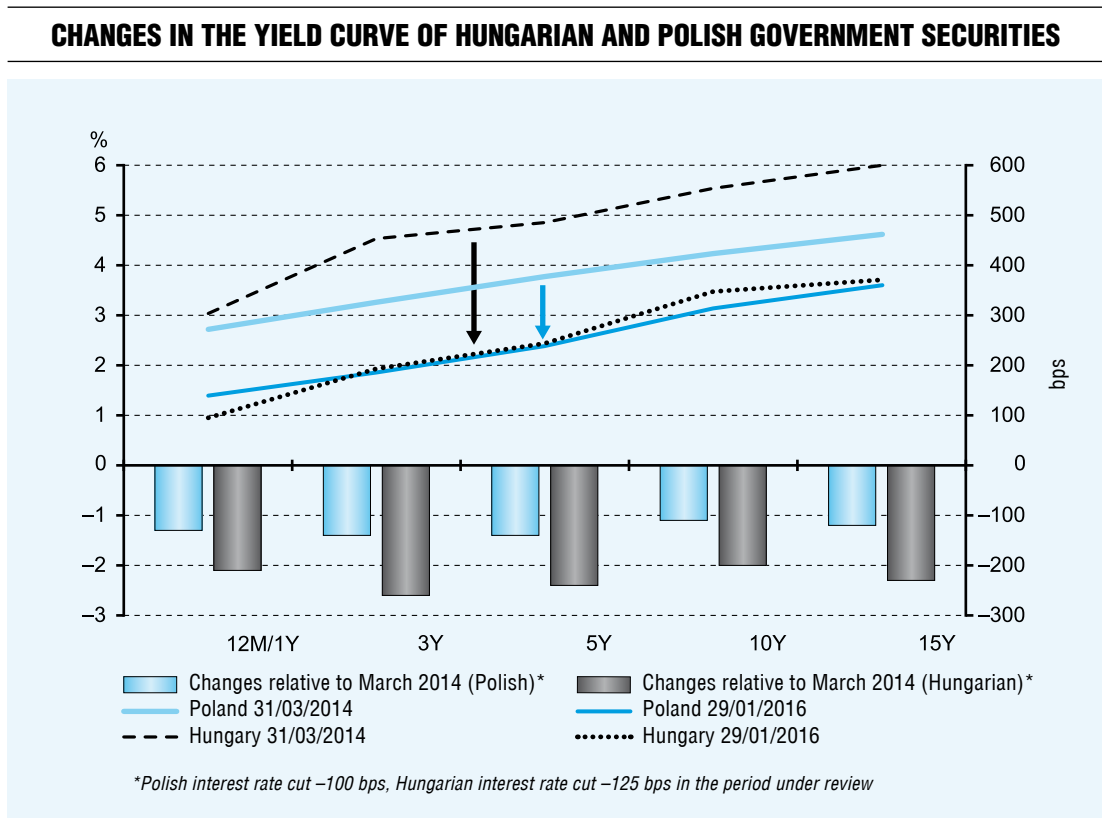
the announcement of the Self-Financing Programme – has practically vanished by early 2016 in the 3–5-year segment (see Figure 14).

As regards monetary policy effects, the impact of the transformation of central bank instruments on monetary policy transmission – one of the classic duties of central bank implementation and instruments – should also be examined. The monetary transmission mechanism means the process whereby monetary policy influences the ultimate objective of monetary policy, inflation (or economic output). The first step of the transmission mechanism is the attainment of the operative objective of monetary policy. The operative objective is attained when money market yields adequately reflect the level of the base rate or the expectations concerning the base rate. Monetary transmission may be regarded

as efficient when central bank instruments ensure that primarily short-term money market yields adjust to the (also typically short-term) key policy rate.<sup>43</sup> It is not obvious how this can be measured, but since the movement of overnight market interest rates is limited by the interest rate corridor between the central bank O/N deposit and lending rates, the movement of these interest rates should certainly be examined. In our analysis we started from the assumption (which is in fact a simplification, but capable of capturing processes) that in Hungary the movement of the overnight unsecured interest rate (HUFONIA) around the base rate may be regarded as a good approximation of monetary transmission.

In Hungary, monetary transmission is fundamentally determined by the structural liquidity surplus characterising the banking

Figure 14



Source: MNB

system, as a result of which interbank (market) interest rates typically hover around the base rate and the central bank O/N deposit interest rate (see Figure 15).

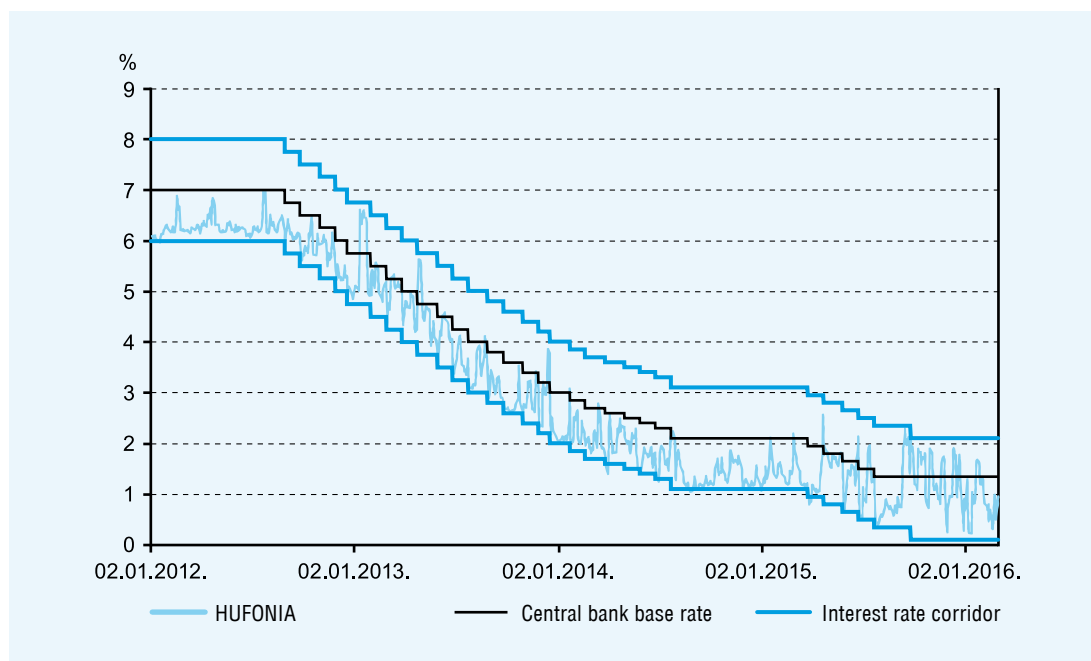
The Self-Financing Programme and the central bank's FX liquidity providing instruments related to the phasing out of households' foreign currency loans significantly reduced the central bank liquidity of the banking system in 2014 and 2015,<sup>44</sup> which means that, in addition to the contraction of the stock of liquid assets,<sup>45</sup> the measures of the MNB *ceteris paribus* lowered the level surplus liquidity (that structurally impairs monetary transmission), and as they overstretched banks' liquidity management, they exacerbated the volatility of yields.

In Hungary the transformation of central bank instruments did not affect permanently and substantially the departure of overnight

interbank yields from the base rate. The average difference of O/N unsecured interbank rates from the base rate was -0.67 per cent in 2012, -0.41 per cent in 2013, -0.65 per cent in 2014 and -0.51 per cent in 2015. The 2015 value corresponds to the average level of the two years preceding the announcement of the Self-Financing Programme. Based on MNB (2015a), the apparent increase in the difference in 2014 was due to the fact that in the August-September period the supply of liquid instruments declined in the wake of the phase-out (transformation into deposits) of the two-week bill, while demand for liquid instruments increased in the banking system, which exerted a downward pressure on money market yields. The frictions, however, proved temporary, which clearly demonstrates the improvement observed in monetary transmission in 2015. The increase in the volatility of

Figure 15

**CHANGES IN THE O/N INTERBANK RATE WITHIN THE CENTRAL BANK INTEREST RATE CORRIDOR**



Source: MNB

interest rates is also consistent with the reduction of liquidity and the transformation of the instruments at the MNB's disposal.

## CONCLUSION

External vulnerability posed a relevant challenge to the Hungarian banking system after Hungary was hit by the crisis, which provided justification for defining the reduction of exposure as one of the key objectives of Hungarian economic policy. To that end, and in accordance with its mandate laid down in the MNB Act, the MNB launched the Self-Financing Programme which, through the reform of central bank instruments, encouraged banks to transform their liquidity management, while routing banks' funds at the central bank towards liquid securities, primarily to the government securities market.

The Self-Financing Programme affected the MNB's entire set of monetary policy instruments. The asset side of banks' balance sheets has been transformed in line with the impact mechanism of the Self-Financing Programme. The actual processes were consistent both with the output effects arising on the basis of the Mandl–Dierx–Ilzkovitz model (refinancing of foreign currency debt with forint, increasing the collateral securities portfolio on banks' balance sheets, contracting the sterilisation

portfolio) and with the relevant outcome effects (reducing external financing, lowering the ratio of foreign currency debt to public debt, looser monetary conditions). In accordance with the original objectives of the programme, the external vulnerability of Hungary substantially decreased,<sup>46</sup> while monetary transmission did not deteriorate.

According to the Debt Management Outlook of the Government Debt Management Agency,<sup>47</sup> in 2016 the net issue of forint-denominated government securities may be around HUF 1,800 billion, a level comparable to previous years. In terms of magnitude, net foreign currency issuance is expected to be similar to 2015, around HUF –1,000 billion. If the issue plan of the ÁKK is implemented and banks' demand remains adequate, the foreign currency ratio of public debt may decrease further, allowing for the further moderation of external vulnerability. By the end of 2016, the share of foreign currencies in public debt – in case a large portion of maturing foreign currency debt is refinanced from forint funds – may also drop to 27 per cent. This would mean that in a matter of five years the 50 per cent ratio (a historic peak) would be almost halved. The MNB supports this process with the phase-out of the two-week deposit, as a conclusion of the reform of central bank instruments under the Self-Financing Programme.<sup>48</sup>

## NOTES

<sup>1</sup> Bindseil (2014)

<sup>2</sup> Kolozsi (2015)

<sup>3</sup> On this, see Blanchard et al. (2012) and Stiglitz (2012)

<sup>4</sup> For further details, see Akerlof et al. (2014)

<sup>5</sup> Bindseil (2014)

<sup>6</sup> Specifically, the Fundamental Law and Act CXXXIX of 2013 on the Magyar Nemzeti Bank

<sup>7</sup> After the crisis hit Hungary, changes in the central bank toolkit did not only arise in the context of the Self-Financing Programme. Between 2008 and



2012 numerous new tools were introduced by the MNB; in 2013 the Funding for Growth Scheme was announced, and starting from 2014, instruments related to the phasing out of households' foreign currency loans also appeared.

<sup>8</sup> In this regard, see MNB (2015a) and Nagy (2015)

<sup>9</sup> As regards the macroeconomic significance of external vulnerability, see Kóczyán et al. (2016)

<sup>10</sup> The central bank may not assume the debt of the economy if the securities market of the private economy is not sufficiently developed; it has a limited ability to buy corporate securities; and its government securities market interventions are constrained by the prohibition of monetary financing (see Article 123 and Article 125 of the Maastricht Treaty). It has opportunities, however, to improve the liquidity of the bond market using non-traditional central bank instruments, and support economic policy in the channelling of internal savings. Through their credit stimulating instruments, central banks may indirectly encourage lending to the private economy, e.g. by providing funds, or by partially assuming credit risks or facilitating their management.

<sup>11</sup> For details, see *Matolcsy* (2015)

<sup>12</sup> See *Lentner* (2015)

<sup>13</sup> *Moody's* (2015)

<sup>14</sup> See for example, IMF (2014), European Commission (2014), *Moody's* (2013)

<sup>15</sup> The three other objectives are: (1) stop and reverse the ever increasing path of public debt, (2) attain a reversal in employment, and (3) reverse the trend of deteriorating competitiveness and that of the alarmingly decelerating growth rate of potential output. See: Government of Hungary (2013)

<sup>16</sup> On this, see *Felcser, Soós and Váradi* (2015)

<sup>17</sup> On non-conventional easing, see: MNB (2015b)

<sup>18</sup> See *Csávás and Koroknai* (2014)

<sup>19</sup> See MNB (2014)

<sup>20</sup> "Structural liquidity surplus" means that the aggregate net balance of the banking sector's deposit holdings with the central bank is positive.

<sup>21</sup> It cannot be seen as a "healthy" state if – for no particular liquidity management reason – the banking sector keeps its funds in preferential central bank instruments.

<sup>22</sup> As regards banks' adjustment, it is an important consideration that the enforcement of tighter liquidity requirements will reinforce this incentive. Indeed, after the introduction of the LCR ratio, credit institutions may only consider items maturing within 30 days as liquid assets; consequently, the three-month main policy instrument will improve the LCR ratio only in one-third of its term on average. The 100 per cent LCR compliance will enter into force in April 2016, which may prompt credit institutions with liquidity constraints even more to invest in government securities or other marketable instruments instead of the central bank deposit facilities. See *Nagy – Palotai* (2015)

<sup>23</sup> Assuming bank adjustment through the purchase of government securities.

<sup>24</sup> Assuming that the bulk of foreign currency debt is held by non-resident investors.

<sup>25</sup> The deduction as well as Figure 5 clearly show that self-financing pre-supposes a partial utilisation of the central bank's foreign exchange reserves. Before the announcement of the MNB's Self-Financing Programme, at the end of March 2014 the foreign exchange reserves amounted to EUR 36.2 billion, and by end-2014 they dropped to EUR 34.6 billion overall. Meanwhile, short-term external debt – the

key indicator of reserve adequacy – fell from EUR 28.3 billion at end-March 2014 to EUR 21 billion by end-2014. In 2014, the level of central bank reserves significantly exceeded the level of short-term external debt. As shown in MNB (2014) and in the analysis of *Csávás and Teremi* (2015), the volume of reserves was adequate looking ahead as well; thus it can be established that there was sufficient latitude to implement the measures based on actual as well as projected data.

<sup>26</sup> See Kolozsi (2014), Hoffmann and Kolozsi (2014)

<sup>27</sup> See Nagy and Palotai (2015)

<sup>28</sup> The Hungarian banking system is characterised by structural liquidity surplus; therefore, the main policy instrument of the central bank is on the liability side. The absorption of the liquidity surplus is indispensable for financial stability and efficient monetary transmission. The key policy rate is set by the Monetary Council.

<sup>29</sup> Central bank deposits are less liquid than central bank bonds, as they may not be broken before maturity, they are not accepted as collateral for central bank transactions, and they can be held only by counterparties of the central bank, excluding all other domestic and non-resident investors.

<sup>30</sup> A longer term means a worse liquidity profile.

<sup>31</sup> With a view to reducing the volatility of interbank rates and absorbing liquidity shocks, the MNB offers overnight standing facilities to commercial banks. The interest rate corridor is the gap between the O/N deposit rate and the O/N lending rate.

<sup>32</sup> The reason for the transformation of the interest rate corridor was that by autumn 2015 the yield on short-term government securities fell to the level of central bank O/N deposit rates. In such yield environment the liquidity and yield profile of central bank O/N deposits did not support the channelling

of banking funds outside of the central bank. The asymmetry of the interest rate corridor appreciated non-central-bank liquid securities.

<sup>33</sup> Integrated into the European Union harmonisation, this step was made possible by the significantly increased liquidity in the banking system and the improving liquidity position of money markets in the recent years.

<sup>34</sup> That is, by keeping their funds in central bank deposits instead of liquid securities.

<sup>35</sup> As a condition for using interest rate swaps, banks participating in IRS tenders pledge to raise the value of their security holdings eligible as collateral in line with the volume of the concluded interest rate swaps. the volume of the concluded interest rate swaps.

<sup>36</sup> In the central bank's IRS transactions banks may swap the typically fixed interest rates of securities (government securities) for floating rates.

<sup>37</sup> The last two changes provided a greater flexibility for banks, increasing the probability of banks' participation in the programme, hence the effectiveness of the programme.

<sup>38</sup> As regards the economic convergence potential, see Palotai and Virág (2016)

<sup>39</sup> Government Debt Management Agency (2014)

<sup>40</sup> Government Debt Management Agency (2015)

<sup>41</sup> Among balance-sheet-increasing factors, the inflow of EU transfers and the Funding for Growth Scheme stand out, while the repayment of foreign currency loans, the foreign currency expenditures of the government and foreign currency interest expenditures all point to the contraction of the balance sheet.

<sup>42</sup> Assuming a balance sheet contraction of HUF 1,952 billion, a Hungarian base rate of 1.35 per cent and

a near-zero international yield environment, this amounts to almost HUF 26.3 billion per year.

<sup>43</sup> See Introduction

<sup>44</sup> See MNB (2015a) and Hoffmann, Kolozsi and Nagy (2014).

<sup>45</sup> As a result of the transformation of central bank instruments, and in particular, the transformation of the two-week MNB bill into a deposit, the portfolio of liquid instruments available for banks substantially decreased.

<sup>46</sup> It may partly reflect the results of the Self-Financing Programme that international investor and analyst perceptions about the vulnerability of the Hungarian economy changed considerably over the past 2–3 years. While at the end of 2013 or early in 2014 country assessments repeatedly called attention to the key risk associated with the structure and the financ-

ing composition of public debt, as well as the high ratio of foreign currency funds and external finance, by end-2015 or early 2016 the tone of the assessments concerning Hungary changed fundamentally. This is aptly demonstrated by the example of the International Monetary Fund (IMF). In 2014 the IMF emphasised that in Hungary “still-high public and external financing needs, heavy reliance on non-resident funding, uncertainty regarding advanced economies’ monetary policies, and re-emergence of financial stress in emerging markets pose risks”. Its assessment of February 2016, however, added that “the Hungarian economy is performing very well and its vulnerability to shocks has declined substantially”, and that “the self-financing programme contributed to a significant reduction in the exposure of the economy to exchange rate risk”. See IMF (2014) and IMF (2016)

<sup>47</sup> ÁKK (2016)

<sup>48</sup> MNB (2016)

## LITERATURE

AKERLOF, G. – BLANCHARD, O. – ROMER, D. – STIGLITZ, J. (2014): *What Have We Learned? Macroeconomic Policy after the Crisis*. MIT Press. 2014

BINDSEIL, U. (2014): *Monetary Policy Operations and the Financial System*. September 2014. p. 336, ISBN: 9780198716907. *Bookseller Code* (AG)

BLANCHARD, O. et al. (2012): *In the Wake of the Crisis. Leading Economists Reassess Economic Policy*. The MIT Press. International Monetary Fund. 2012

CsÁVÁS, Cs. (2015): A devizatartalék-megfelelés értékelésének nemzetközi trendjei (International Trends in the Assessment of the Adequacy of Foreign Exchange Reserves). MNB article. July 2015 <https://www.mnb.hu/letoltes/csavas-csaba-a-devizatartalek-megfeleles-ertekelesenek-nemzetkozi-trendjei.pdf>

CsÁVÁS, Cs. – TEREMI, M. (2015): A devizatartalékok elvart szintje: jóból is megárt a sok? (Expected Level of Foreign Exchange Reserves: Too Much of a Good Thing?). MNB article. October 2015 <https://www.mnb.hu/letoltes/csavas-csaba-teremi-marton-a-devizatartalekok-elvart-szintje-jobol-is-megart-a-sok.pdf>

CsÁVÁS, Cs. – KOROKNAI, P. (2014): *Visszanyerni az egyensúlyt: Hol tartunk most? (Regaining the Balance: Where Are We Now?)*. MNB article. 2014 <https://www.mnb.hu/letoltes/visszanyerni-az-egyensulyt-cikk-teljes-csavas-koroknai.pdf>

DYSON, K. (2014): *States, Debt, and Power: ‘Saints’ and ‘Sinners’ in European History and Integration*. Oxford University Press. 2014

FELCSER, D. – SOÓS, G. D. – VÁRADI, B. (2015): *The Impact of The Easing Cycle on the Hungarian*

Macroeconomy and Financial Markets. *Financial and Economic Review*, 14 (3), September 2015, pp. 39–59. <https://www.mnb.hu/letoltes/fer-2015-3-en.pdf>

HOFFMANN, M. – KOLOZSI, P. P. (2014): Az önfintanszírozási program stabilabb állampapírpiacot eredményezett (The Self-Financing Programme Resulted in a More Stable Market). MNB article. 2014 <https://www.mnb.hu/letoltes/hoffmann-mihaly-kolozsi-pal-peter-az-onfinanszirozasi-program-stabilabb-allampapirpiacot-eredmenyezett.pdf>

HOFFMANN, M. – KOLOZSI, P. P. – NAGY, M. (2014): A forintosítás időben elnyújtva csökkenti a jegybank mérlegét és így a forintlikviditást (The Conversion to Forint Contracts the Balance Sheet of the Central Bank and thus, Forint Liquidity, Extended in Time). MNB article. 2014 <https://www.mnb.hu/letoltes/a-forintositas-idoben-elnyujtva-a-jegybank-merleget-es-igy-a-forintlikviditast.pdf>

KÓCZIÁN, B. – KOROKNAI, P. – LÉNÁRT-ODORÁN, R. – SISAK, B. (2016): Finanszírozási modellek makroszempontról (Funding Models from a Macro Perspective). In: Palotai Dániel and Virág Barnabás: *Versenyképesség és növekedés (Competitiveness and Growth)*. National Bank of Hungary. 2016

KOLOZSI, P. P. (2014): Stabilabb és olcsóbb finanszírozást hozhatnak az MNB új eszközei (New MNB Instruments Could Lead to More Stable and Cheaper Financing). MNB article. 2014 <https://www.mnb.hu/letoltes/kolozsi-pal-peter-jegybanki-eszkozok.pdf>

KOLOZSI, P. P. (2015): Útkeresés és megújulás a közgazdasági gondolkodásban (New Ways in Economic Thinking: Reflection and Renewal). *Polgári Szemle*. June 2015. Year 11, Vol. 1–3

LENTNER, Cs. (2015): *The Big Handbook of Foreign Currency Lending*. Nemzeti Közzolgálati és Tankönyvkiadó. Budapest, 2015.

MANDL, U. – DIERX, A. – ILZKOVITZ, F. (2008): The Effectiveness and Efficiency of Public Spending. European Economy. *Economic Papers*, 301. February 2008. Brussels. pdf. 36 pp. Online: [http://ec.europa.eu/economy\\_finance/publications/publication11902\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication11902_en.pdf)

MATOLCSY, Gy. (2015): *Egyensúly és növekedés – Konszolidáció és stabilizáció Magyarországon (Equilibrium and Growth – Consolidation and Stabilisation in Hungary)*. Kairosz kiadó. 2015

NAGY, M. – PALOTAI, D. (2015): Az MNB eszközeinek megújításával tovább csökkenti az ország sérülékenységét (The Renewal of MNB Instruments Will Reduce the Country's Vulnerability Further). MNB article. 2015 <https://www.mnb.hu/letoltes/150603-nagy-marton-palotai-daniel-az-mnb-eszkozeinek-megujitasaval-tovabb-csokkenti-az-orszag-serulekenyseget.pdf>

NAGY, M. (2015): Az önfintanszírozási program költségei eltörpülnek az előnyei mellett (The Benefits of The Self-Financing Programme Dwarf its Costs). MNB article. 2015 <https://www.mnb.hu/letoltes/nagy-marton-az-onfinanszirozasi-program-koltsegei-eltorpuznek-az-elonyei-mellett-1.pdf>

PALOTAI, D. – VIRÁG, B. (2016): Versenyképesség és növekedés (Competitiveness and Growth). Magyar Nemzeti Bank. 2016

STIGLITZ, J. (2012): Macroeconomics, Monetary Policy and the Crisis. In: Blanchard et al.: *In the Wake of the Crisis. Leading Economists Reassess Economic Policy*. The MIT Press. International Monetary Fund. 2012

SUPRIYADI, A. (2014): External Vulnerability Indicators: The Case of Indonesia. Bank Indonesia. Paper Submitted for the Seventh IFC Biennial Conference on 4–5 September 2014 [http://www.bis.org/ifc/events/7ifcconf\\_supriyadi.pdf](http://www.bis.org/ifc/events/7ifcconf_supriyadi.pdf)

European Commission (2014): Communication from the Commission to the European Parliament,

the Council and the Eurogroup. Results of in-depth reviews under Regulation (EU) No 1176/2011 on the prevention and correction of macroeconomic imbalances. Brussels, 5.3.2014 COM(2014)http://ec.europa.eu/economy\_finance/economic\_governance/documents/2014-03-05\_in-depth\_reviews\_communication\_en.pdf

Government Debt Management Agency (2014): Government Debt Management Report. 2014 <http://akk.hu/uploads/qwGY2g7B.pdf>

Government Debt Management Agency (2015): Government Securities Market. Monthly Report. December 2015 <http://akk.hu/uploads/lr4JmOn2.pdf>

Government Debt Management Agency (2016): Debt Management Outlook. 2016 <http://akk.hu/uploads/17bPO2wM.pdf>

Government of Hungary (2013): Convergence Programme of Hungary 2013–2016). [http://ec.europa.eu/europe2020/pdf/nd/cp2013\\_hungary\\_hu.pdf](http://ec.europa.eu/europe2020/pdf/nd/cp2013_hungary_hu.pdf)

IMF (2012): Pilot External Report. July 2, 2012 <http://www.imf.org/external/np/pp/eng/2012/070212.pdf>

IMF (2014): Statement at the Conclusion of the IMF's 2014 Article IV Consultation Mission to Hungary Press Release No. 14/115 March 20, 2014 <http://www.imf.org/external/np/sec/pr/2014/pr14115.htm>

IMF (2016) Hungary – 2016 Article IV Consultation Concluding Statement of the IMF Mission

February 15, 2016 <http://www.imf.org/external/np/ms/2016/021616.htm>

Magyar Nemzeti Bank (2014): Improving Hungary's Debt Profile. Banks can Contribute to Hungary's Self-Financing through Government Security Purchases. Background material. 2014 <https://www.mnb.hu/letoltes/mnb-hatteranyag-az-orszag-adossagszerkezetovabb-javithato.pdf>

Magyar Nemzeti Bank (2015a): The Magyar Nemzeti Bank's Self-Financing Programme – April 2014 – March 2015. 2015 <https://www.mnb.hu/letoltes/magyar-nemzeti-bank-onfinansirozasi-programja-1.pdf>

Magyar Nemzeti Bank (2015b): Press release on the Monetary Council meeting of 15 December 2015 <https://www.mnb.hu/monetaris-politika/a-monetaris-tanacs/kozlemenyek/2015/kozlemeny-a-monetaris-tanacs-2015-december-15-i-uleserol>

Magyar Nemzeti Bank (2016): Termination of the two-week deposit to complete the reform of the MNB's policy instruments. Press release. 12 January 2016 <https://www.mnb.hu/sajtoszoba/sajtokozlemenyek/2016-evi-sajtokozlemenyek/a-kethetes-jegybanki-betet-megszuntetesevel-kiteljesedik-az-mnb-eszkozatar-fordulata>

Moody's (2015): The Evolution of Emerging Market Sovereign Debt: Dramatic Growth in Local Currency Sovereign Debt Is Reducing Emerging Market Financial Vulnerabilities, Report, 2015