MNB Bulletin

July 2014

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The aim of the Magyar Nemzeti Bank with this publication is to inform professionals and the wider public in an easy-to-understand form about basic processes taking place in the Hungarian economy and the effect of these developments on economic players and households. This publication is recommended to members of the business community, university lecturers and students, analysts and, last but not least, to the staff of other central banks and international institutions.

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Summary

DEAR READER,

The Magyar Nemzeti Bank attaches great importance to making central bank analyses on various current economic and financial trends of general interest available to the wider public. Issue 2 of 2014 of the MNB Bulletin contains altogether six articles, encompassing a diversity of Bank thinking on central banking issues.

In their article, István Ábel, Kristóf Lehmann, Gergő Motyovszki and Zoltán Szalai discuss fears of deflation in developed countries. The authors explain that a decline in prices does not in itself constitute deflation. However, if the decrease in prices is extensive and sustained and if it is incorporated into expectations, and if a liquidity trap constrains the scope of monetary policy and there is a risk of a debt spiral, then there is a danger of deflation.

Ádám Banai, Zsuzsanna Hosszú, Gyöngyi Körmendi and Bence Mérő examine how base rate cuts influence bank profitability. Central bank interest rate cuts affect the profitability of the Hungarian banking sector through numerous channels. In their article, the authors provide an overview of the impact mechanisms relevant to the relationship between the central bank base rate and banks' profitability. They then proceed to quantify the impact of an interest rate reduction of 100 basis points on the profitability of the banking sector. According to their findings, while the profitability effect over a two-year horizon is not negligible, it does not influence monetary policy transmission materially. Since the authors' calculations depend on the initial status of the macroeconomic environment, their results should not be applied automatically at any interest rate level.

The article by József Banyár, Koppány Nagy, Ferenc Szebelédi, László Windisch and Zoltán Zubor presents the background to the pension insurance recommendation. On 26 May 2014, the Magyar Nemzeti Bank issued a recommendation with a view to ensuring that the insurance products available on the market contribute to financial self-reliance, serve customer needs and requirements and comply with the objectives of the legislator. The article summarises the theoretical and practical considerations underlying the recommendation.

László Bodnár, Miklós Luspay and Annamária Madarász wrote an article titled 'The effect on payments of the conversion of MNB bills into deposits'. The authors examine the possible adjustments by banking sector participants in response to the conversion of the two-week MNB bill into deposits in terms of liquidity and then analyse the impact on credit institutions resulting from the removal of the MNB bill from the pool of eligible collateral using historical data.

In their article, Orsolya Csortos, Kristóf Lehmann and Zoltán Szalai analyse the theoretical considerations and practical experiences of central bank forward guidance. They take a look at the practice of, and experiences from, forward guidance during the crisis through the example of the US Federal Reserve and the European Central Bank. Based on the authors' findings, although the strategic importance of this type of communication instrument may wane after the crisis, there has been an undeniable shift towards communicating monetary policy assessments of, and responses to, the prevailing conditions, and thus towards greater transparency in the operation of central banks.

Gábor P. Kiss wrote an article on the fiscal rules for the pension balance. The fiscal rules of the European Union include the annual balance of pension payments and contributions; consequently, they fail to provide a suitable incentive for reducing longer-term imbalances. It may be justified to exclude the pension balance from the coverage of these fiscal rules and to regulate the balance in such a way to ensure that it is maintained over the long term. In this case, the bias for measures with immediate effects would be eliminated, which, given that the current regulations are focussed on the short term, may overshadow other measures with long-term effects. Circumvention of this flexible rule can be avoided if the projection of the pension balance in a reliable and controlled manner and the measures required to reduce longer-term imbalances cannot be postponed. It is also necessary to harmonise national regulations with the EU's fiscal framework.

The Editorial Board

István Ábel, Kristóf Lehmann, Gergő Motyovszki, Zoltán Szalai: Deflation fears in developed economies

Fears of deflation in the euro area intensified in early 2014. Low or negative inflation in several euro-area countries has increased the risk of deflation. The European Central Bank's communication suggests that the Bank considers deflation a genuine risk. In Japan, economic policy has been struggling with deflation for over a decade now and has recently introduced a number of quantitative and qualitative easing measures. While Hungary is not directly threatened by deflation risks, persistent deflation in the euro area and the associated stagnation would have an adverse effect on this country as well. In this article, we explain that a decrease in price levels does not in itself constitute deflation. By contrast, if the decrease in prices is extensive and sustained and if it is incorporated into expectations, and if a liquidity trap constrains the scope of monetary policy and there is a genuine risk of a debt spiral, then there is a danger of deflation.

PRICE DECREASE AND DEFLATION

A mere decrease in prices (negative inflation) does not in itself constitute deflation. Several factors must apply simultaneously in order for deflation to occur. If there is a lasting decline in prices and a weak demand environment (with a negative output gap) and if this is built into the expectations of future changes in prices, then the economy will experience deflation. Deflation intensifies if the central bank is in a liquidity trap[1] and unable to sustain a sufficiently low real interest rate. A decline in prices due to temporary, one-off shocks (e.g. reductions in indirect taxes, base effects) does not constitute deflation. Nor does a price decrease represent deflation if it has become entrenched due to technological progress, an increase in productivity or the intensification of international competition. Such price decreases tend to only affect specific sectors and generally do not result in a decline in prices across the economy as a whole. Deflation tends to be coupled with a reduction in activity, whereas technological progress, productivity increases and price decreases resulting from intensified competition have a favourable impact on economic growth.

Rising productivity and international competition have the natural outcome of driving down prices. This may occur as a sudden shock: we call this a positive supply shock, which may result, for instance, from a sudden and lasting decrease in raw material and energy prices or a leap in technical progress. In today's global economy, the improvement in certain services is referred to as just such a factor, driving prices down in telecommunications and financial services for instance. The downward trend in certain prices observed today in the United States is mostly attributable to such factors. Price decreases of this type do not represent a deflationary risk. Although they may trigger decreases in the prices of other products, they will not generate an unstoppable spiral of declining production and increasing unemployment, since they represent a change only in the relative prices within the economy rather than a fall in the overall price level. And if some products become cheaper, consumers will use the income they are thus able to save to buy other products or to buy more of the cheaper ones. They may also put this income into savings, which other participants may then borrow and spend. A decrease in aggregate demand may also be shock-

[1] Keynes discussed the liquidity trap in detail, but admitted that he had not witnessed such a situation in practice. Burdekin–Siklós (2004) cite Keynes' findings in detail. An 'absolute' and a 'relative' interpretation of the term has developed in the literature on the subject. An example of the former is found in Krugman (1998): this influential study discusses the reasons for the deflation in Japan and the possible way out by means of economic policy. In this understanding, a liquidity trap develops once the central bank reaches the zero lower bound with its nominal interest rates and becomes unable to provide economic stimulus any further. It was Jan A. Kregel who, in dispute with Krugman, expounded the relative interpretation. According to Kregel, a liquidity trap may develop even before the zero lower bound is reached if the markets become one-sided as all the players only consider probable a rise rather than any further decrease in interest rates. Rather than hold bonds, the participants seek to avoid the risk of capital loss due to rising interest rates by choosing to hold non-interest bearing instruments (cash, liquid cash on account, etc.). Both arguments, however, share the observation that the interest rate as a monetary policy tool becomes ineffective once interest rates have fallen very low. For a more detailed discussion see Csortos et al. (2014).

like (one-off negative demand shock), for instance as a result of a sudden fall in the value of consumers' wealth (e.g. if share prices tumble). It should be clear, however, that this in itself does not represent deflation either. Although significant declines on the stock markets may be an indicator of increased deflationary risks, a threat of deflation will apply only if the negative demand shock causes the price decrease to last, which is then built into expectations, and monetary policy has limited scope for offsetting these trends. Accompanying such a situation is the liquidity trap, a phenomenon in which even an almost unlimited supply of liquidity is unable to halt the contraction in prices and production.

ADVERSE EFFECTS OF DEFLATION

Deflation can curb economic activity through three channels. In one channel, the increase of the real interest rate triggers a vicious cycle of recession and permanent price level decreases resulting from the disappearance or postponement of private sector demand, consumption and capital investment.[2] Limited labour flexibility arising from labour market rigidities and from the forces acting against the nominal decrease of wages represents the second channel. The reduction of real wages in the event of a fall in price levels would necessitate an especially high degree of nominal wage reductions. Although workers would be happy to accept work for lower wages when money is tight, this kind of flexibility is hampered by labour market rigidities and the rules and contracts binding employers, which may lead to increasing unemployment and falling production.[3] Recovery from recession may be rather lengthy without more flexible adaptation on the labour market. The third channel increasing the costs of deflation is represented by the debt spiral and the losses incurred in the debt deflation it engenders. In order to reduce their debts, which are unsustainable in part due to the rise in the real costs of debt service, economic agents will be frequently forced to sell their assets at depressed prices. Forced liquidation and a devaluation of financial assets and real estate is inevitable when everyone is forced to dispose of these assets to reduce their indebtedness.

Real interest rate channel

Most of the costs of deflation do not depend on the negative value of inflation in the strict sense; instead, adverse impacts appear even while inflation is still positive, but remains below expectations (which may eventually lead to genuine deflation). The emphasis is on the deviation from the expectations, which may trigger pressure to adjust. One effect of inflation below the expected level (or deflation) will be a rise in real interest rates, which in turn influences the decisions of corporations as well as households. If the real interest rate is higher, delayed consumption may reduce demand and increase unemployment. Higher real interest rates also increase the cost of capital for investment projects, and thus the fall in the net present value of expected yields may cause a contraction in investment activity. A decrease in demand pushes prices downwards, which may increase the real interest rate further, potentially triggering a negative spiral. In this mechanism, the *stock* of participants' debts is disregarded and we speak about the connections between the categories of production, capital investment and consumption *(flow)* within the framework of the traditional business cycles.

It should be noted that, beyond the nominal rate of interest, the real rate of interest also depends on the inflation expectations of economic agents. Whereas negative expectations may destabilise the economy through self-reinforcing processes, properly anchored positive inflation expectations may prevent such a spiral. There are a number of other stabilisation mechanisms that may prevent a deflationary spiral from developing. Overall, the practical relevance of deflation developing via these channels of the business cycle is low, as long as expectations are properly anchored by the fiscal and monetary policy. In these circumstances, applying the conventional instruments of stabilisation will achieve recovery from recession sooner or later.

A problem may arise when the fiscal and monetary policies also have limited scope for action. For instance, as a liquidity trap approaches a central bank may be unable to provide sufficient stimulus to neutralise deflation, since it is unable to reduce the nominal interest rate sufficiently to offset the rise in the real interest rate. In such a situation, even an almost unlimited supply of liquidity would be unable to reverse the fall in prices and production. In such instances, the forward guidance of monetary policy may help shift inflation expectations towards the longer-term inflation target. The inflation target can fulfil its role as anchor if monetary policy is credible; this is a precondition for the success of forward guidance. It works if the central bank is able to commit to continuing to keep the base rate low once the macroeconomic

[2] Reviewing deflationary episodes throughout history until the end of the 19th century, Burdekin–Siklos (2004) describe in detail these episodes, most of which reflected the mechanism of the real interest rate channel. The deflationary debt spiral, which the authors call Fisher's debt deflation, is referred to merely as a serious threat in this overview, even though it was at the very heart of the crisis of 1929–33. The authors emphasise the international nature of the Great Depression which differs from other episodes in that it occurred simultaneously in the United States and numerous other countries of the world.

[3] Keynes was sceptical about wage cuts as an adjustment mechanism in situations when aggregate demand is otherwise insufficient. In his characterisation, wages are an important component of aggregate demand, and further reducing them may reinforce a negative spiral.

situation no longer demands this. It is important the central bank is also able to prevent long-term yields from rising too soon to prevent the risks of increased capital loss triggered by rising inflation expectations. The central bank may choose to achieve this by purchasing longer-term securities.[4] A promise of a path of low real interest rates combined with well anchored inflation expectations will have a stimulating effect on the economy.

Labour market rigidities

Another channel through which deflation costs emerge is the limited ability of real wages to adjust. In the event of moderate positive inflation, a minor decrease in wages may be achieved when nominal wages do not rise with the rate of inflation. If the economy experiences productivity growth, then a slow adjustment of real wages may be achieved even if the rate of real wage growth remains below the rate of productivity improvement (see box below). However, if the rate of inflation is low or negative, cutting nominal wages is the only way left to reduce real wages. A number of studies have looked into the downward rigidity of wages, i.e. the fact that employees tend to refuse quantifiable nominal decreases to their wages (see Ackerlof et al., 1996; Altonji–Devereux, 2000; Benigno–Ricci, 2011; Daly–Hobijn, 2014 and Kahn, 1997). As a result, companies are less able to cut the labour cost component of their production by reducing real wages after a negative shock, and tend to do the same by laying off the labour force, which leads to higher unemployment and deeper recession. In the event of deflation, real wages are not only less able to adjust: in fact, they will rise, which may increase unemployment independently of the initial shock.

Box 1
On the adjustment of unit labour costs (ULC)

The ratio of unit labour costs (ULC) to those of foreign competitors (the ULC-based real exchange rate) is a key factor in determining price and wage competitiveness. It has the following three determinants: the nominal exchange rate, nominal wages and the productivity of labour. A depreciation of the real exchange rate will improve competitiveness and can be achieved via a weaker nominal exchange rate, lower nominal wages or higher productivity. The most favourable of the above scenarios is achieving improvement via faster growth in productivity, since this will not lead to an economic downturn or unemployment. In contrast, the other means for achieving real depreciation may cause problems.

Due to rigidities, a major decrease in nominal wages can only normally be achieved in an environment of high unemployment, which would, via the drop in demand, lead to recession and intensified deflation, and may also trigger a debt spiral, if there are significant debts outstanding. All of this may override the ability of a weaker real exchange rate to improve competitiveness. This kind of adjustment may be facilitated by high wage inflation in the foreign trade partner countries, since it allows improving relative wages easily, without effectively reducing domestic nominal wages.

The depreciation of the nominal exchange rate will have a mostly inflationary impact, directly via import prices and indirectly via the foreign demand that may be expected to increase in response to the improved competitiveness; however, the direct and indirect import content of exports and the extent of the economy's debts denominated in foreign currency must be taken into account in this regard. A depreciation of the exchange rate increases the value of foreign debt in domestic currency, which means a higher real debt burden. The resulting forced deleveraging may counteract the favourable impact of the weaker exchange rate on export competitiveness and may, in an extreme case, trigger a deflationary spiral and in turn a worsening recession.

[4] For more detail, see Csortos et al. (2014) and Aglietta (2013), pp. 19–24 The Federal Reserve, the Bank of England and the Bank of Japan have all combined forward guidance with securities purchases in order to keep longer-term yields low. Central banks tend to focus on the short-term interest rate segment and will intervene in longer maturities of the yield curve only when necessary. There is much greater uncertainty in this segment as to whether the intended objective can be achieved.

Deflationary debt spiral

The third channel represents an even greater problem. Measures taken to curb debts that have grown unsustainably high cause a decline in consumption and capital investment. An inflation path below what was expected at the time of borrowing increases the real debt burden. If all debtors were able to avoid default, then income would be reallocated to creditors in a period of deflation. And since creditors tend to be characterised by a higher rate of savings, this type of income reallocation reduces consumption demand. Tax revenues fall as a combined effect of a loss of demand and price decreases, while the costs of financing the government debt fail to decline, and thus the deficit may increase. Even this may not necessarily be a problem, since the increase in household and corporate savings due to the delay in consumption and the decrease in capital investment may finance the deficit, and therefore a deterioration of the balance of payments is not inevitable. Bigger problems may arise due to private sector debts. The increase of the debt burden of households and corporations in an economy in a deflationary spiral will be similar to the impact of the depreciation of the exchange rate on foreign currency debt. Debt is fixed nominally and is generally subject to high rates of interest, even as the value of the assets underlying the loans (real estate or other collateral) falls with deflation. In order to avoid having to reduce their outstanding lines of credit, corporations must offer additional collateral to supplement their existing collateral which has devalued in the meantime. This forces the private sector to cut its debts and deleverage. The consequences of the pursuit of debt deflation are self-reinforcing. The money spent on this will not boost demand; instead, it tends to reduce capital investment directly as well as indirectly.

The fall in demand due to delayed consumption (if it is not yet a permanent fall caused by debt deflation) tends to trigger a temporary under-utilisation of capacities, rather than a contraction in capacities. By contrast, debt deflation tends to constrict capacities. Moreover, it may occur even without prices actually falling: it is sufficient if the rate of price increase remains steadily below the rate expected at the time of borrowing. In such a case, debt service (real interest rate) will be much higher than originally calculated. This shock forces a reconsideration of the calculations, leading to a sort of deleveraging that may trigger deflation via spillover and self-reinforcing channels.

Even though the interaction between production, capital investment and consumption (*flows*) triggers stabilisation mechanisms, the correlations concerning debt (*stock*) change the situation fundamentally. Banks play a pivotal role in this process. As soon as they realise that their clients are in trouble, they cut back their lending. Since banks lend not only to corporations but to other banks as well, the spillover effect of this tightening of credit will force other banks to cut back their lending as well. This in turn puts even more clients in a difficult situation and the adverse trend continues. In a normal business cycle, the banking system is able to halt the debt spiral and thus stabilise the economy. When the central bank notices tensions in economic activity and lending, it lowers the interest rate and injects liquidity into the banking system. As a result, the banking system is not forced to cut back its lending and is able to assist in the recovery. The private sector reduces savings, and consumer and capital investment demand increases. In a debt spiral, by contrast, the private sector will continue to try to cut its debts and increase its savings, even as liquidity is provided to the banking sector and interest rates are kept low. Higher savings will, in turn, result in lower consumption and a decline in capital investment, which deepens the recession and leads to a vicious circle of failure. Household incomes fall, and savings sufficient to reduce indebtedness to the desired level are not reached; on the contrary, the burden of the now reduced debt is even higher in comparison to incomes, prompting households to try to save even more. Deleveraging in the corporate sector is a similarly self-fulfilling failure that exerts pressure to continue debt deflation.

The central bank can help by cutting interest rates and providing liquidity, but the outcomes will be limited. Interest cannot fall below a certain level, since liquidity would wind up in cash beyond this level (absolute or relative liquidity trap) and would not generate demand. Once it has started, a deflationary debt spiral is difficult to stop. Left on its own and without intervention, the recession may become entrenched (stagnation). A debt spiral represents a greater threat than the deflationary episodes discussed above: without debt, the pressure to save would soon ease and the system would stabilise. In a debt spiral, however, the real appreciation of the debt continues to propel this pressure and thus feeds into a self-reinforcing deflationary mechanism.

WHAT CAN A CENTRAL BANK DO IF A LIQUIDITY TRAP IS REACHED?

As long as there is no liquidity trap constraining its room for manoeuvre, monetary policy can rely on its conventional instruments to achieve a decline in the real rate of interest, which boosts activity and may thus offset the deflationary pressure.[5] However, the situation changes at around an

[5] Bernanke (2002) and Svensson (2003) discuss the wide range of instruments available to central banks to combat deflation. A study by Borio–Filardo (2003) is a good example of an evaluation of the deflationary threat from the perspective of monetary policy.

interest rate level that is close to zero. At this level, the real rate of interest may be higher than is necessary for stabilising the economy, but the central bank is unable to reduce it further by cutting the base rate, as a result of which a permanently weak economic environment may cause deflation.

In such a case, the central bank may try to credibly anchor inflation expectations to a positive inflation target in order to achieve its objective, since this may limit the increase in the forward-looking real interest rate even in a liquidity trap and may prevent deflation from becoming embedded in expectations and thus triggering self-reinforcing processes. Even in this scenario, the resulting real interest rate may be higher than necessary for stabilising the economy. In addition to cutting short-term interest rates to zero, the reduction of long-term yields may also help. This may necessitate non-conventional monetary policy instruments, and quantitative and qualitative easing as well. Quantitative easing involves asset purchases, by way of which the central bank actively intervenes in the market of certain financial instruments and thus reduces the yields there, and potentially even the longer-term yields. The Fed, the Bank of England, the Bank of Japan and, to a certain extent, even the European Central Bank have taken such steps since the start of this crisis. The effectiveness of these measures depends on the state of the financial system as well. The other method, the one most frequently used today, is that of forward guidance, i.e. actively influencing expectations of the future changes in monetary policy in order to influence the present-day macroeconomic outcomes. Promises of accommodative monetary conditions and a low interest rate environment sustained over the long term in order to drive long-term nominal interest rates down as well, may create in the present a lower expected interest rate path looking forward and thereby stimulate the real economy.[6]

Nevertheless, once deflation has occurred and has been incorporated in the expectations, such measures are likely to have only a limited impact. Accordingly, if the risk of deflation is sufficiently high, proactivity and preventive action may be preferable to fighting it.

The Taylor rule and the Fisher equation

Benhabib et al. (2001) describe one of the most widely known models for the possibility of a deflation trap. Their analysis has attracted considerable response, and although the assumptions of the DSGE model analysed are rather restrictive, the simple framework used for illustration has proven useful in subsequent analyses as well (Antolin-Diaz, 2014; Bullard, 2010). In the following, we adopt Antolin-Diaz's (2014) depiction to illustrate deflation risk using Japanese, European and American data.

Chart 1 is a schematic representation of two relationships. One is the relationship describing the interest rate decision of the monetary policy-makers as an increasing function of the inflation rate: $r_{nominal} = f(\pi)$. This is the so-called Taylor rule representation, indicating that the central bank responds to rising inflation by raising the interest rate progressively, with an inclination for more aggressive interest rate increases the higher the inflation. Inflation reflects the difference between demand and supply conditions. The market response to excess demand is a price increase, whereas the response to excess supply is a price decrease. The negative output gap also captures the imbalance of supply and demand (in addition to the inflation rate) and also represents a component of the Taylor rule (although we did not make this explicit in the diagram). If the output gap is negative and if the economy is characterised by insufficient demand in a recession, then the central bank will cut the interest rate to boost demand. However, interest rate cuts have an absolute lower bound at zero per cent, as is demonstrated by the flattening of the Taylor rule curve as it nears the horizontal axis.[7]

Another relationship pictured in Chart 1 with a dotted line, is the Fisher equation (Fisher, 1933). According to this, economic agents make their decisions by taking the real interest rate (r_{real}) into account. The nominal interest rate $(r_{nominal})$ is calculated as the real interest rate plus inflation expectations (π^e):

$$r_{nominal} = r_{real} + \pi^e$$

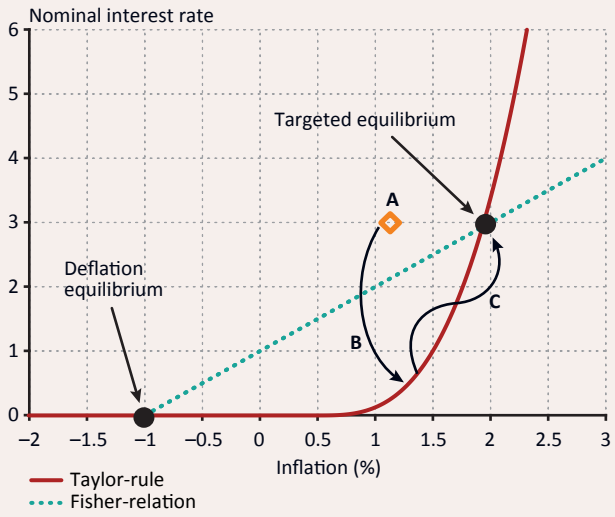
The Fisher equation plotted in the diagram shows the special case when expected inflation equals the actual rate of inflation and the real interest rate stands at 1 per cent. If this value is equal to the *equilibrium real interest rate* (a constant 1 per cent), then inflation at this level will be unchanged, whereas there is inflationary pressure below it and disinflationary/deflationary pressure above it. The equilibrium real interest rate is given by the intersection of the Taylor curve and the Fisher dotted line. At this point, the economy is balanced in the sense that the nominal interest rate implied by the monetary policy decision rule and the inflation in the economy coincides with the equilibrium real interest rate. Of the two intersections, the desirable and targeted equilibrium is found at the point where the inflation rate equals the central bank's inflation target (the Taylor rule is defined with this in mind). If the economy is at Point A in Chart 1, that is not an equilibrium. The rate of inflation is lower and the real interest rate is higher

[6] Given the modern bond market, such stimulus may be thwarted if economic agents overreact to the increasing inflation expectations and start to sell to avoid bond losses. The sell-off would drive real yields up. See Csortos et al. (2014).

[7] See Footnote 1 on the absolute and the relative lower bound, and the liquidity trap.

than it would be in equilibrium. Economic agents may respond to this by, for instance, finding it worthwhile to increase their savings, which reduces consumption, which in turn reduces prices via a decline in demand. This phenomenon may justify a monetary policy decision to cut interest rates in light of the decreasing inflation and a potential negative output gap occurring. This is the segment of the curve denoted by B in the diagram. The interest rate cut will trigger capital investment after some time, which may result in a higher employment rate and increased demand, which in turn may lead to inflationary pressure and, ultimately, interest rate rises (Phase C).

Chart 1
The Taylor rule and the Fisher equation



We have used an approximate, theoretical argument based on assumptions to describe the adjustment process above. Further analysis involving the accurate matching of quantitative attributes would be necessary to give us a more realistic understanding of the adjustment. One may suspect that, as the case may be, the path may lean towards the deflation trap shown in Chart 1 instead of adjustment towards the desired equilibrium. In such a situation, the real interest rate is exactly at its equilibrium level, but the central bank could not achieve its inflation target and monetary policy has limited options for easing by reducing further the real interest rate. To the left of this point, with the real interest rate higher than the equilibrium, the deflationary pressure becomes self-reinforcing.

A more detailed analysis would allow us to present the relative version of the liquidity trap instead of its better-known, absolute version; in the relative version the graph of the Taylor rule remains above zero throughout and intersects the axis representing the nominal interest rates at a positive value. The above description is arbitrary and simplified also because it uses a single interest rate to characterise monetary conditions, whereas in reality it is the whole yield curve that plays a role in monetary transmission. The behaviour of long-term yields on the largely liquid bond markets is greatly influenced by growth and inflation expectations, while at the same time they are sensitive to changes in short-term interest rates. At these maturities, the higher nominal interest rates cannot compensate for the higher expected inflation given the risk of capital loss on bonds, which means that the behaviour of long-term interest rates is not predictable and the simple Fisher equation is unable to describe even its direction well.[8]

We note that the Taylor rule represents the possible responses of monetary policy and does not incorporate fiscal policy explicitly. According to Richard Koo, who introduced the notion of 'balance-sheet recession', fiscal policy expansion is the only means for stimulating the economy in an environment of deleveraging.[9]

A COMPARISON OF INFLATION FEATURES IN JAPAN AND THE EURO AREA

The strategic framework of the Japanese central bank continues to focus primarily on achieving price stability. At its monetary policy meeting in January 2013, the Bank of Japan adopted an inflation target of 2 per cent with a stronger commitment than the temporary target a year before. Since the country has faced protracted deflationary difficulties for a long time, the central bank is using all instruments available to commit itself to breaking the deflationary spiral.

Over the past 15 years, the average annual rate of inflation has been -0.3 per cent in Japan. Unlike in the Great Depression of 1929–33, when prices fell sharply in a short period of time, Japan now has experienced a fall in consumer prices by a small degree, but lasting for a very long time. Deterioration was also moderate in terms of unemployment, the rate of which reached only 5.5 per cent even in the worst periods, in contrast to the mass unemployment during the Great Depression. One may compare the present-day deflation in Japan to a chronic lifestyle issue. Once the expectations had incorporated all of this, breaking the spiral became very difficult. What made managing the situation even harder in Japan was the fact that the key interest rate had been reduced to 0.5 per cent back in 1995, allowing little room for further rate cuts. The decline in prices damaged capital investments and dampened economic growth. From a macroeconomic perspective, however, debt deflation and the dramatic fall in

[8] See Kregel (2000); described in Csortos et al. (2014).
[9] Koo calculates that the government 'prevented' JPY 2,000 trillion in losses by deficit spending of JPY 460 trillion in the period 1999–2005.

property prices caused much greater losses than the deflation of consumer prices.[10] Over the past decade and a half, the Japanese economy has faced serious growth challenges due to the prolonged deleveraging process.[11] Property market assets experienced a significant fall in prices in the first half of the 1990s (urban property prices fell by half over the course of 5 years), which resulted in debt deflation (deleveraging) in the private sector due to the significant contraction in the growth outlook. Economic policy shifted towards flexible wage adjustment to mitigate the decline in employment. The decline in wages, the strong competition among businesses and the increase in imports prompted corporations to change their pricing strategies, leading to deflation (a decrease in the general price level).

This permanent deflation correlated with the weak economic growth expectations. In the period of debt deflation, which started in the 1990s, even continued monetary easing failed to boost the economy. The Japanese central bank announced that its zero base rate policy, employed from 1999 onwards, would last as long as deflationary expectations existed. Monetary easing proved ineffective however. On the contrary, the global recession fears prevailing in 2001 further reinforced the expectations of low economic growth and a decline in the price level in Japan. The appreciation of the Japanese yen against the US dollar further aggravated this trend. All of this worsened export competitiveness and made imported goods cheaper, which also drove down inflation. Since its traditional monetary policy instruments had reached their limits, the Bank of Japan started to employ quantitative easing in the period of 2001 through 2006 in order to restart economic growth and lending via further easing of monetary conditions. It failed to stimulate the economy substantially in this six-year period, and deflationary expectations became entrenched. Even the combined effect of forward guidance and securities purchases was barely able to reduce long-term yields and was certainly unable to boost aggregate demand.[12] Deleveraging by economic agents and banks' risk avoidance outweighed the effects of the central bank's policy.[13] Given the immense additional growth challenges during the global financial crisis, even further monetary easing was unable to prevent the continued decline in the price level.

As the base rate was still at zero, in April 2013 the Bank of Japan decided to implement a programme of 'quantitative and qualitative easing' (QQE). QQE seek to increase the proportion of longer-term Japanese government bonds within the balance sheet of the central bank in a two-pillar approach. First, they have expanded the asset purchase programme budget in annual phases of JPY 50 trillion and, second, they have sought to increase the maturities of the assets in the balance sheet by buying longer-term assets. As a result, the average maturity of 3 years may grow to 7 years. It was decided unanimously that the monetary base would serve as the main target instrument instead of the unsecured overnight lending rate. They plan an expansion of the monetary base by JPY 60–70 trillion every year and to maintain the scheme until reaching a stabilisation of inflation expectations at around the target. Simultaneously with its expansion of quantitative and qualitative easing, the Bank signalled in its forward guidance that it would maintain this policy of aggressive easing until inflation rose permanently to near the 2 per cent target.

The experience of Japan raises the question of how this could have been avoided. In their analysis, Ahearne et al. (2002) state that deflation had been entirely unexpected in Japan. Strong competition forced corporate rationalisation, which increased unemployment and even though consumption grew, deflation became entrenched.

THE EURO AREA DRIFTS TOWARDS DEFLATION

Inflation has been below the target for several months in the euro area. However, this low inflation is attributable primarily to the negative price changes in some countries along with the low energy and raw material prices, rather than a fall in demand across the entire euro area. Furthermore, inflationary expectations are anchored at around the target level and there are no signs of delaying purchases at the level of the area as a whole; according to the forecast of the European Central Bank, aggregate demand will continue to rise across the forecast horizon. As a result, the European Central Bank does not consider area-wide deflation as an immediate threat.[14]

[10] Naohiko et al. (2005) and Koo (2012). In 1990s property prices plummeted by 87 per cent. The loss in securities and property wealth amounted to three times the GDP for the year 1989, whereas it was equal to annual GDP in 1923–33 in the United States (Koo, 2012).

[11] According to former central bank governor Shirakawa, Japan lost two decades, of which only the first was attributable to the balance-sheet recession. Balance sheets were cleaned up in the first decade and the subsequent slow rate of growth can be explained by an aging society: the growth rate of per capita GDP is comparable to the relevant figures in other advanced economies. He does not believe that a boost to aggregate demand would resolve this problem caused by demographic factors (Shirakawa, 2012).

[12] Ugai (2007), Aglietta (2013).

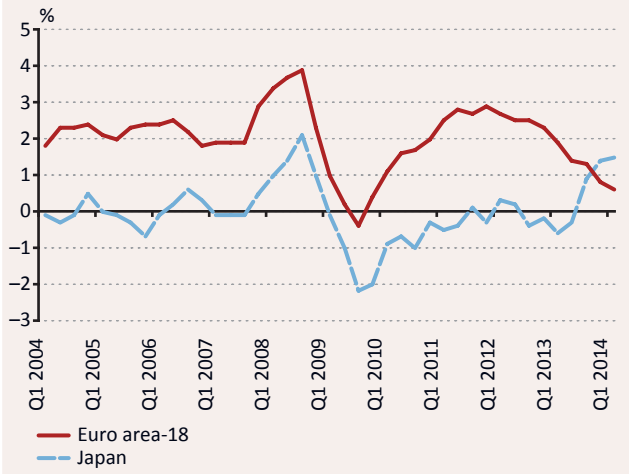
[13] "The importance of anchoring inflation expectations has been widely recognised and many central banks consider well-anchored inflation expectations as one measure to gauge the effectiveness of monetary policy. However, as yet there are no established theories on how inflation expectations should be brought back to the target once they have drifted downward. In particular, we do not have established theories that explain how inflation expectations can be raised at the zero lower bound and that suggest feasible policy measures to achieve this." Kuroda (2014, p. 5.)

[14] There are numerous dissenting opinions on this matter, as many analysts believe that the ECB's dilatory behaviour is highly risky (Mody, 2014).

A presentation of inflation trends

Even if we leave the macroeconomic relations aside and focus solely on price developments, we see signs suggesting deflation in the euro area. A comparison of inflation trends in the euro area with Japan, which has been grappling with deflation since the 1990s, reveals a worrying picture (Chart 3).

Chart 2
Consumer price index trends in Japan and the euro area



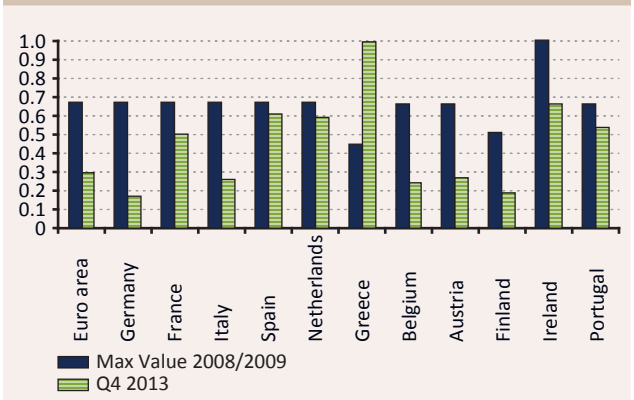
Source: OECD.

Negative price trends are affecting certain countries in the euro area, primarily those that faced serious crises and needed external rescue schemes (Cyprus, Greece and Latvia). This in itself does not imply a threat of deflation across the area as a whole, since the relative price adjustment in these countries compared to the euro area as a whole does not exclude the possibility that such a negative adjustment would be merely transitional. The adjustment after the euro accession of the pre-accession prices, which had been above the area average and therefore detrimental to competitiveness, presupposes a decline in prices within a monetary union since devaluation is not an option to help the adjustment. Negative price trends in certain countries within a monetary union will not cause deflation as long as most of the countries experience inflation. In an integrated market, the arbitrage mechanism ensures that price gaps remain within certain limits and, at a longer time horizon, capital inflows and other factors of production may also have a similar effect.

Real interest rates have increased steeply in more indebted countries even as the rate of inflation fell below one per cent, which suggests an emerging threat of a deflationary debt spiral. If the rate of inflation is near zero, resistance to cutting real wages (nominal wage rigidity) may intensify the problems in labour market adjustment. At the moment, this is an especially pronounced issue in the euro-area periphery countries, where real wages should be reduced to regain competitiveness. There are adverse developments in the price gaps within the euro area, and there are forces at play that drive divergence. Since the policy rate is the same in every member state, the real interest rate will be lower in countries with higher inflation, which is a factor for boosting growth. The struggling countries of the periphery are experiencing deflationary trends today, which in turn means higher real interest rates leading towards deeper recession.[15]

Taking into account the differences between the countries of the euro area, Husabø (2014) calculated a deflation risk indicator that measures how broadly negative values occurred in the three-month price changes.[16] It evaluates deflation risk by measuring negative changes not only in terms of the European Central Bank's inflation index (HICP), but also taking into account the negative changes in producer prices (PPI), the GDP deflator and wages; it also assesses whether there has been a negative change in the majority of the HICP components. Beyond the product dimension, the index also has a time dimension. It considers a negative price trend lasting for more than six months of the year as deflation. The third determinant in the index measures the changes in expectations. The deflation indicator may take a value between 0 and 1, where 1 is the value denoting deflation. The index values calculated per country are presented in Chart 3.

Chart 3
Deflation risk index in the euro area
(2008/2009 and 2013)

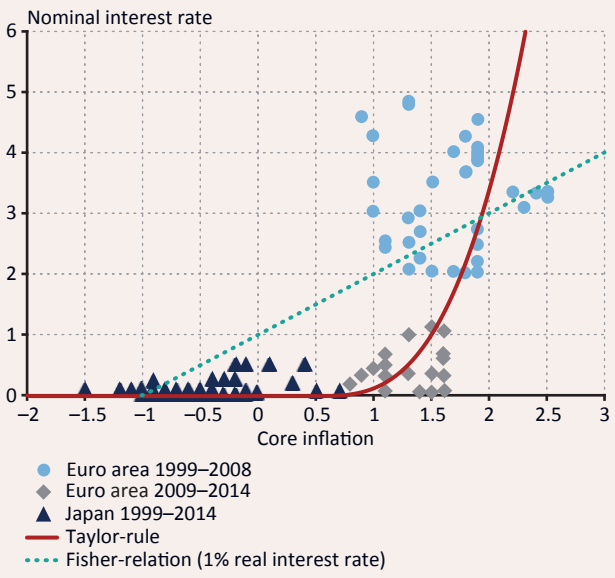


Source: Husabø (2014).

[15] Walters (1986) highlighted the risk of deepening divergence.
[16] Of the IMF occasional papers looking at the issues of the multi-determinant measurement of deflation, Decressin–Laxton (2009) and Kumar et al. (2003) provide detailed overviews.

Chart 3 shows that the threat of deflation had fallen by the end of 2013 from the previous critical maximum levels of 2008–2009 in all of the member countries except Greece. In this comparison, the deflation risk appears to be waning across the euro area as a whole. However, monetary policy has also changed in the meantime and we are nearer the zero interest level, which is critical in terms of deflation. Plotting the inflation and interest rate figures of Japan and the euro area in the framework discussed by Benhabib et al. (2001) and employed by Bullard (2010) and Antolin-Diaz (2014) results in the image shown in Chart 4, which suggests that the euro area has drifted towards deflation.

Chart 4
Euro area drifting towards deflation



Even the European Central Bank does not completely exclude the possibility of deflation risk in a scenario where the area-level price index remains permanently low, e.g. below one per cent. This may impact consumers' expectations as well. Furthermore, low inflation across the entire area makes relative price adjustment harder to achieve in the countries that have lost their competitiveness as they will need greater reductions in wages and costs to regain their relative competitiveness; minor but protracted negative price development may be required.

Although this is not mentioned by the European Central Bank, the debt spiral version of deflation, which is discussed by analysts, is already having an impact.[17] The real burdens of debtors (households, corporations and public sectors) are higher than the debt service calculated at the time of borrowing. This applies especially in the crisis-stricken countries experiencing declining prices. Deleveraging is made all the more difficult by low inflation or price decreases in these countries. In the IMF's assessment (Moghadam et al., 2014), the situation in the euro area is best described by the verbal innovation "lowflation" rather than the word deflation.

SUMMARY

Deflation occurs when a decline in prices takes place in an environment of permanent demand deficit (negative output gap), a stagnating economy and interest rates close to zero, with inflation expectations also remaining permanently low. A decline in prices triggered by transitional factors is not considered to be deflation. A permanent decline in prices caused by increasing productivity or price competition is not deflation either, as it is normally coupled with an intensification of economic growth. Accordingly, Japan's lost decade was spent fighting deflation; and the current developments do not promise recovery any time soon, in spite of some very aggressive quantitative and qualitative easing. While deflation risks are low in the euro area as a whole, it is not clear at the moment whether the economies on the periphery can recover after their forced deleveraging or will instead slide into deflation characterised by a debt spiral.

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[17] De Grauwe (2014).

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Ádám Banai, Zsuzsanna Hosszú, Gyöngyi Körmendi and Bence Mérő: Impact of base rate cuts on bank profitability

The adequate long-term earnings potential of the financial intermediary system is essential from the perspective of financial stability. Therefore, the impact of economic developments, e.g. monetary policy, on the profitability of the banking system is an important issue. Central bank interest rate cuts affect the profitability of the Hungarian banking sector through numerous channels. In our study, we provide an overview of the impact mechanisms relevant to the relationship between the central bank base rate and banks' profitability. We then proceed to quantify the impact of an interest rate reduction of 100 basis points on the profitability of the banking sector. According to our findings, the profitability effect over a two-year horizon amounts to HUF –26.9 billion (in other words, the average annual difference is HUF –13.4 billion) which, while not negligible, does not influence the monetary policy transmission materially. Since our calculations depend on the initial status of the macroeconomic environment, our results should not be applied automatically at any interest rate level.

POSSIBLE CHANNELS OF BASE RATE CUTS ON BANK PROFITABILITY

Lowering the key policy rate affects profitability through a number of direct and indirect channels. The most direct effect is perceived on banks' interest rates on forint-denominated loans and deposits.

According to the time series, interest rates on newly issued loans and new deposits follow changes in the key policy rate rapidly and to a great extent. As a result, the interest margin remains virtually unchanged with no direct effect on profitability.

As regards changes in the interest rates on the outstanding portfolios, overnight forint deposits comprise a substantial part of deposits. As interest rates on sight deposits are extremely low, they cannot be lowered in line with the key policy rate and therefore the deposit margin narrows. This is one of the most important negative effects of the interest rate cuts on profitability. The impact of the easing cycle on fixed interest rate deposits is similar, since in this case as well the interest rate margin moves in tandem with the central bank base rate. As regards variable rate deposits, the interest rate on the deposit tracks the key policy rate, leaving the interest rate margin unchanged which, therefore, does not affect profitability.

As is the case with deposits, loan products include both fixed and adjustable rate structures. In their case, the impact mechanism of a key policy rate reduction is the same as in the case of deposit interest, however, it works in the opposite direction: while the lowering of the key policy rate does not influence profitability in the case of products with referential pricing, it improves profitability in the case of fixed interest rate loans. Subsidised housing loans comprise nearly one third of forint-denominated loans. Although the interest rate is fixed for a long term (at least 5 years) for borrowers, due to the subsidy system profitability is not affected substantially by interest rate cuts. Forint-denominated loans provided at market rates also include loans pegged to a reference rate. Likewise, profitability in their case is not affected significantly by the lowering of interest rates. Finally, fixed interest rate loans play an important role in the unsecured loan portfolio, and their profitability is affected favourably by the interest rate cuts.

Changes in bank lending and deposit rates can influence profitability not only through interest margins but also through the size of loan and deposit portfolios. The lowering of deposit rates may be accompanied by a decline in the deposit portfolio as households and corporations may shift their savings to instruments offering higher yields. This, however, means that the banking sector must replace private sector savings by other, more expensive funds, which has a negative effect on profitability. The lower the central bank base rate is reduced, the greater this effect may be. At the same time, the reduction of lending rates may increase the demand for loans which, through the disbursement of new, low-risk loans, increases the performing loan portfolio and improves banks' loan portfolio

and profitability. At present, this channel is weakened by several effects in the Hungarian economy: households' high indebtedness, cautious consumer behaviour and a lack of confidence in banks are keeping households' demand for loans at a steadily low level while interest rates are falling. As regards the corporate segment, the Funding for Growth Scheme (FGS) accounted for a substantial part of new loans in the second half of 2013, and since the interest rate on loans issued in the context of the FGS is independent of the central bank base rate, its impact on the loan demand of the SME segment was more predominant than changes in the key policy rate.

Apart from the loan and deposit portfolios, changes in the central bank base rate also influence the profit or loss deriving from the rest of the balance sheet items. Of these items, the two most important channels deserve special attention: the revaluation yield stemming from the price change of certain assets (e.g. government papers), and potential revenues from open FX positions. Owing to the balance sheet structure and FX position of the Hungarian banking sector, an interest rate reduction exerts a positive effect through both of these channels.

Besides the channels mentioned so far, the central bank base rate influences bank profitability through the real economy and through exchange rate developments as well. An easing cycle helps improve the domestic outlook for economic activity, increases investment and employment and facilitates, through a weaker exchange rate, export growth. On the one hand, growth in investment and production boosts corporate credit demand, and on the other hand, the profitability of corporations improves which, in turn, reduces the risk of default. At the same time, the weaker exchange rate increases debt servicing burdens, which has the opposite effect (particularly in the case of non-exporting companies indebted in foreign currency) on loans' probability of default. As production grows, employment and the disposable income of households both increase, which spurs household demand for credit and increases the number of creditworthy households, thereby improving profitability. Apart from the above, interest rate cuts affect the performance of loans through two additional channels. In the case of loans pegged to a reference interest rate, lower rates translate into smaller instalments and hence, they improve portfolio quality. This, however, is less typical in the case of the household portfolio. A potentially weaker exchange rate resulting from an interest rate reduction deteriorates the performance of foreign currency debtors, which imposes losses on the banking sector as well. At present, the larger part of the household portfolio is still denominated in foreign currency. Taken together, therefore, it is not entirely clear whether the quality of the loan portfolio improves or deteriorates in the wake of an interest rate reduction.

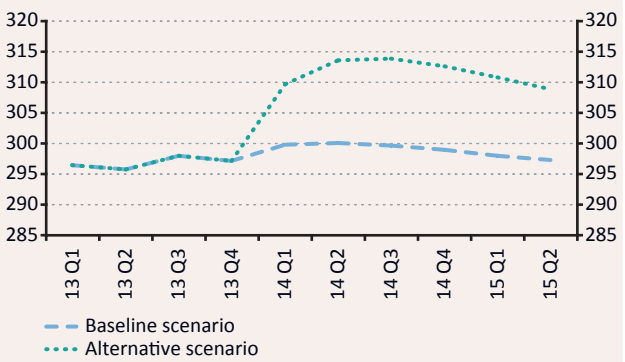
The improvement in economic activity may raise the value of real estate serving as collateral which, through the decline in LGD,[1] mitigates loan losses. However, the continuing decline in house prices suggests that a more pronounced improvement is required in economic activity for there to be an increase in collateral values. In the case of foreign currency debtors, the weakening of the exchange rate may be accompanied by an increase in LGD, as the exchange rate change – as opposed to outstanding principal – does not increase collateral value expressed in HUF. Since a significant portion of indebted households have foreign currency loans, in the context of a weaker forint exchange rate, interest rate cuts may deteriorate the quality of the household portfolio, despite the improvement in economic activity.

The changes induced by the central bank base rate in the income position of the banking sector also have an impact on the income position of other sectors. Owing to the lower interest rates on deposits and loans, lowering the key policy rate undermines the income of net savers, while it improves the income position of net borrowers. A lower base rate might improve the general government balance via net interest expenditure. Owing to the key policy rate, the lower debt service burden improves the income position of forint debtors, while higher instalments in the context of the weaker exchange rate deteriorate the income position of foreign currency debtors.

QUANTIFICATION OF THE EFFECTS

In order to assess the impact of the easing cycle, we applied the central bank stress test (Banai et al., 2013) and considered

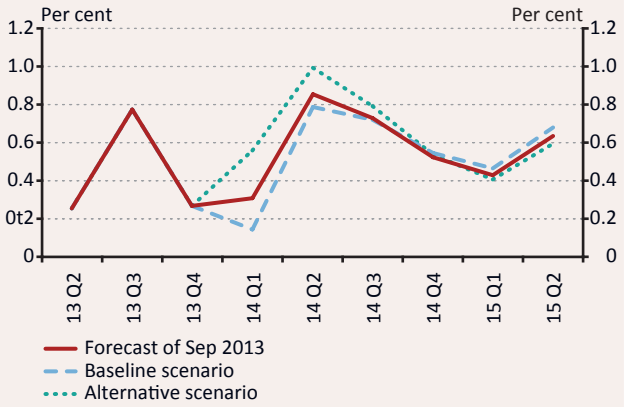
Chart 1
Exchange rate level along the different paths



[1] LGD (loss given default): the ratio of losses on defaulting loans to outstanding principal.

the period lasting until 2013 Q2 to be the review period. In the baseline scenario, we simulated the effects of a monetary policy which, following an easing cycle lasting until 2013 Q2, keeps the key policy rate unchanged across the entire forecast horizon. In comparison, in the alternative scenario

Chart 2
GDP growth rate along the different paths



the key policy rate remains 100 basis points lower over the two-year forecast horizon. The macroeconomic scenarios were generated by means of the MPM model (Szilágyi et al., 2013), i.e. the model used for generating the forecasts presented in the MNB's *Report on Inflation*. According to the model, such a monetary policy would weaken the exchange rate by around 4 per cent, while the growth rate of GDP would accelerate over the short term before adjusting somewhat during the second year (however, in terms of its level, the evolving GDP path would be consistently higher in the context of looser monetary conditions). (Charts 1 and 2 present the two macroeconomic scenarios and, in the case of GDP growth, the MNB's official September 2013 forecast is shown. The baseline scenario indicates the original values, while the alternative scenario displays the values associated with the lower central bank base rate).

Thus, the difference between the profits of the banking sector in the two scenarios indicate the extent of change in the profitability of the banking sector induced by the additional, long-term interest rate cut amounting to 100 basis points which took place after 2013 Q2.

For the purposes of this exercise, we applied most of the assumptions typically used for stress tests, but due to the special circumstances involved, we changed the assumptions in some cases. In forecasting profitability, we had previously used the assumption that lending and deposit rates remain unchanged over the forecast horizon. Since in our case it is vital how soon and to what extent the lowering of the key policy rate is reflected in lending and deposit rates, we bore in mind that, from the aspect of repricing, the interest rates of the different portfolios track changes in the central bank base rate to different degrees. In view of our experiences so far (and also in consideration of banks' balance sheet structure), we now relied on the following assumptions: of the 100 basis point interest rate cut only 75 basis points are reflected in the interest rates on household deposits and 25 basis points are reflected in corporate deposit rates, while lending rates fully follow the changes in the key policy rate. In respect of revaluation resulting from asset price changes, we assumed that only assets maturing within two years would be revalued. We left the forecasting methodology of loan losses and the rest of the assumptions unchanged.

By taking account of lending and deposit rates as described above, through the profitability model we can measure the direct impact of the key policy rate on lending and deposit margins. The stress test is prepared on the assumption of a static balance sheet; therefore, the initial deposit and loan portfolios are revalued only to reflect the exchange rate change both in the baseline scenario and the stress scenario. We have no reliable estimate on how the deposit portfolio changes in response to the key policy rate. As regards the loan portfolio, a substantial increase would have to take place in order to improve profitability significantly (which, in view of households' precautionary attitude, is highly unlikely). This may justify the selection of the typically applied static balance sheet. In the case of loans to households, we generally assume unchanged house prices (and thus, collateral value) when calculating the LGD figure. Compared to housing market developments, this – presumably – is an optimistic assumption; therefore, it would not be justified yet to use a more positive house price path resulting from the interest rate cut. Consequently, we do not expect an increase in the collateral value of household loans. The beneficial effect of the improvement in economic activity is reflected, through GDP, employment, exports and consumption, in household and corporate PD[2] and LGD estimates, resulting in a more favourable portfolio quality. Similarly, the effect of the exchange rate and interest rates on instalments is quantified through PD estimates.

FINDINGS

The effect through changes in lending and deposit rates is primarily reflected in the decreasing interest income from sight deposits. According to our estimates, the difference observed between the two scenarios amounts to HUF 28.2

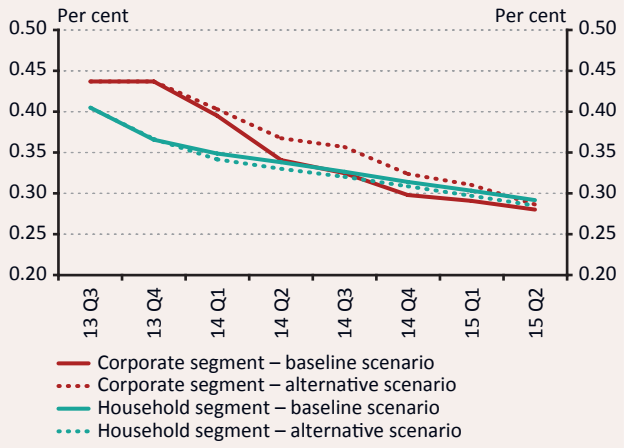
[2] PD: probability of default.

billion over the entire two-year horizon; in other words, as a result of declining interest income, a 100 basis point reduction of the key policy rate reduces the profitability of the banking system by HUF 14 billion on an annual basis.

As a result of open exchange rate positions, a 4 per cent weakening of the exchange rate generates a HUF 1.3 billion positive valuation effect over the two-year horizon.[3] At the level of the banking system, a 100 basis point interest rate cut would translate into a HUF 10.3 billion profit through the repricing of asset side items.

Both in case of the corporate portfolio and the household portfolio, the weaker forint exchange rate resulting from the lower key policy rate initially increases the ratio of non-performing loans and the expected loan loss at default. In the first few quarters this effect is only offset by the smaller instalments attributable to the lower interest rate but, over the long term, also by the stronger economic activity (the effect of which materialises with a lag). As a net result of the above, loan losses on the corporate portfolio prove to be higher along the path assuming a lower central bank base rate (especially in the first year of the two-year period) before they gradually start approaching the values of the baseline scenario (Chart 3).

Chart 3
The cost of provisioning as a percentage of the portfolio



With a lower central bank base rate, credit risk developments are slightly more favourable in the case of the household portfolio over nearly the entire horizon. (The latter can be largely attributed to the exchange rate cap, which protects a large part of foreign currency debtors from the instalment increase generated by the exchange rate change. Accordingly, the exchange rate effect is more moderate in the household portfolio than in the corporate portfolio). The difference between the two paths is relatively small in comparison to total loan loss (Charts 4 and 5). With the lower key policy rate, the loan loss realised on the corporate portfolio is higher by HUF 10.8 billion over the entire two-year horizon. During the same period, the losses on loans to households are slightly smaller (by approximately HUF 0.5 billion) along the path featuring the lower key policy rate.

Chart 5
Loan loss on the household portfolio

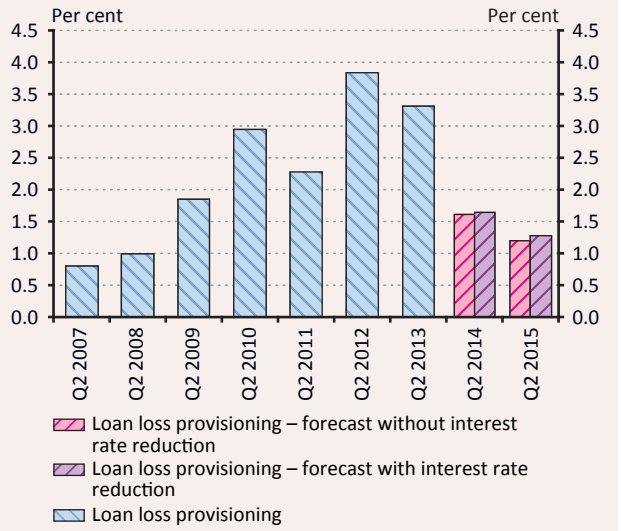
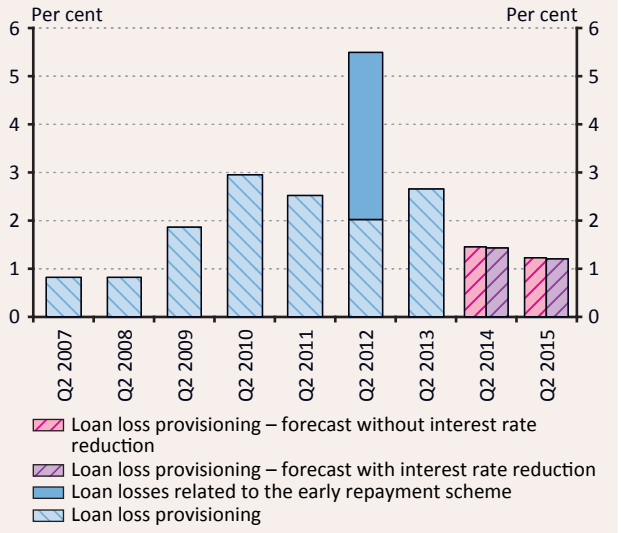


Chart 4
Loan loss on the corporate portfolio



Besides the main channels mentioned so far, during the comparison of the scenarios we incorporated some additional, less important effects or those of a technical nature. These include, for example, the loss incurred by banks as a result

[3] We disregarded the potential impact of open positions deriving from foreign investments.

of the exchange rate cap in the case of the weaker exchange rate; the profit-reducing effect of impairment on the local government portfolio; and the difference in tax liability due to the different pre-tax income. With the lower key policy rate, the loss incurred by banks is HUF 3 billion higher owing to the exchange rate cap; however, as a result of the lower pre-tax income, the tax liability of banks is HUF 3 billion lower. The profit-reducing effect of impairment on the local government portfolio, in turn, is negligible. Taken together, the three effects reduce banks' income by a mere HUF 0.1 billion over the two-year horizon.

Table 1 sums up the difference between the most important effects along the two paths. According to the results, over the two-year horizon the lower key policy rate reduces banks' profitability (i.e. reduces it by a total of around HUF 42 billion) through interest revenue, the loan loss on the corporate portfolio and the exchange rate cap, but improves it (i.e. by around HUF 15 billion) via the price changes of asset side items, revenues from open exchange rate positions, the loan loss on the household portfolio and the lower tax liability. Overall, a long-term, 100 basis point reduction of the central bank base rate reduces the profit of the banking sector by a total of HUF 26.9 billion over the span of two years.

Table 1
Difference between the two paths broken down by main channels

	Difference (HUF billions)
Income without loan loss	–28.2
Revaluation of assets	11.7
Loan loss on the corporate portfolio	–10.8
Loan loss on the household portfolio	0.5
Other (exchange rate cap, corporate income tax, etc.)	–0.1
Total	–26.9

It should also be noted that banking sector figures may mask heterogeneity at the individual level: changes in loan losses may be negative mainly for banks with a higher ratio of foreign currency loans in the portfolio, while declining lending rates tend to have a more pronounced positive effect on the portfolio of banks providing forint loans. Among the large banks, the largest loss amounts to HUF –7.4 billion. Finally, in evaluating our results it is important to bear in mind that the profile of the macro path used in our example is not independent of the initial state.

CONCLUSIONS

The lowering of the central bank base rate affects bank profitability through a number of channels (disregarding banks' possible adjustment). Interest rate cuts have an impact on banks' profits through changes in net interest income, the repricing of certain assets and liabilities or the performance of the loan portfolio. In addition to providing a detailed presentation of this impact mechanism, in our study we also quantified this effect based on our stress testing framework. We found that, at the system level, the profitability effect of a 100 basis point interest rate cut is HUF –26.9 billion over the span of two years; i.e. the easing cycle reduces banks' result by HUF 13.4 billion annually. While not negligible, this amount is not expected to pose a substantial risk to stability. Since our calculations depend on the initial status of the macroeconomic environment, our results should not be applied automatically at any interest rate level.

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József Banyár, Koppány Nagy, Ferenc Szebelédi, László Windisch, Zoltán Zubor: Background to the pension insurance recommendation[1]

Pension insurance contracts concluded after 1 January 2014 provide eligibility for tax incentives in the context of disposition over taxes. With a view to ensuring that the insurance products available on the market contribute to financial self-reliance, serve customer needs and requirements and comply with the objectives of the legislator, the Magyar Nemzeti Bank issued a recommendation on 26 May 2014. This article summarises the theoretical and practical considerations underlying the recommendation. Our point of departure is that simple, transparent products are best suited to these objectives. The tax incentive alone is a suitable tool for supporting sales and should accordingly be passed on in its entirety as an advantage for customers. Annuities and various combinations thereof are optimal tools for achieving pension objectives, while lump-sum payments are only justified in exceptional cases. In the case of unit linked insurance, special attention must be paid to investments and costs. Long-term savings geared towards pensions should be coupled with life-cycle type investment solutions which contain increasingly lower risk instruments as age progresses, compared to instruments with higher yield potential during the initial period. Customer benefits can only be achieved if excessive costs are avoided, which calls for the introduction and reinforcement of products with better cost indicators compared to those found previously on the market, along with the effective cooperation of intermediaries in disseminating these products among customers.

INTRODUCTION

A monotonous downward trend in terms of contract volume has characterised the life insurance market for many years (even if we eliminate the effect of group life, accident and health insurance). Additionally, life insurance provisions have stagnated over the past few years and premium revenues on recurring premium policies have also been falling. The gradual phasing-out of earlier tax allowances was one of the drivers of this decline, along with the financial crisis unfolding from 2008 and waning consumer confidence in life insurance products. A reversal of this trend may be seen in 2014, as a significant step forward was taken in case of tax allowances, one of the three negative factors, with the introduction of a tax allowance on pension insurance. Moreover, there are signs of easing in the financial crisis; at the same time, overcoming the confidence crisis may take years and bold steps by the sector, the legislator and the supervisory authority are necessary. Some changes have already taken place, primarily aimed at improving the transparency of unit linked life insurance: these efforts include the introduction of the total cost indicator (TCI) in 2009 (MABISZ, 2009-2014) or the regulation on commissions taking effect next year, but much work still remains to be done in this regard. Among the functions defined in the Act on the Magyar Nemzeti Bank (the "Central Bank Act"), reinforcing public trust in the financial intermediary system is one of the priority objectives of the Magyar Nemzeti Bank (MNB). With a view to this, the MNB has issued its pension insurance recommendation and hopes to see the pension portfolio supported by the tax allowance built using products that are capable of restoring and bolstering consumers' shaken confidence.

From 1 January 2014, an independent annual tax allowance is granted on newly concluded pension insurance contracts, amounting to 20% of the pension insurance premium paid during the tax year, and capped at HUF 130,000. This is similar to the rate of the tax allowance granted on pension schemes not sold by insurance companies (voluntary pension funds, retirement plan accounts). In other words, this step will eliminate the differentiated management of the various retirement plans from the perspective of tax law, which has long since been contested by the insurance industry and regarded as a major competitive disadvantage of life insurance geared towards pension insurance. The tax allowance follows the positive trend that has emerged over the past few years

[1] MNB (2014).

in terms of its method, which consists of the tax allowance increasing the pension insurance amount instead of trying to persuade taxpayers to forego using their cash over the long run by providing immediate cash benefits.

Even in the short period that has elapsed, the positive effects of the newly introduced tax allowance on the life insurance market can already be felt. This initial upswing can only remain successful in the long run if consumer confidence in life insurance products and insurance companies is restored, which hinges upon the success of pension products. In order for the legislator to maintain tax allowances over the long term, it must be convinced of its utility at the very least. In the case of life insurance geared towards pension savings, adequately regulating access is essential, but not enough. Regulation of voluntary pension funds and retirement plan accounts is relatively broad and deep, and one of the cornerstones of this regulation is a strict cap on costs. The situation is slightly different in case of pension insurance, as only access is really regulated, while other parameters, options and costs are not. It is an important social interest to ensure adequate livelihood for the elderly; supplementary savings geared towards pensions can play a major role in this. Contribution to livelihood during elderly years is a social interest on the one hand, but also an individual need that is often not consciously recognised on the other hand. Fulfilling the state's interest derived from individual needs related to savings geared towards pensions across the broadest possible range calls for the availability of pension products on the market that are truly suitable for satisfying the needs and requirements of customers. State and consumer protection interests are roughly the same in the case of pension insurance, however only covered risks are defined in the form of legal instruments.

As the prudential and consumer protection supervisory authority, the MNB considers it a priority to ensure the presence of products on the financial markets that meet the needs and requirements of customers and are capable of fulfilling their social function. With a view to these objectives, the MNB issued a recommendation on pension insurance on 26 May 2014 in order to foster product development and pricing by insurance companies. The recommendation comprehensively covers the main expectations and advice regarding pension insurance products. This article attempts to present the background underlying these recommendations. In this article, we first present the fundamental principles of the recommendation, the risks to be covered and the role of the tax incentive, followed by a detailed discussion of the services provided, annuities, the life-cycle investment structure and the theoretical background of cost requirements. In conclusion, we present expectations in terms of sales and examine the recommendation as a tool.

PRINCIPLES OF THE RECOMMENDATION

Prior to formulating the recommendations geared towards insurance companies, the MNB defined the fundamental principles representing the starting point of expectations and constituting a unified framework for such. The fundamental principles are simultaneously customer-focused and prudential in their approach: they define a product structure that offers an advantage for customers and promotes the safe operation of insurance companies, which is sustainable in the long run and builds on consumer confidence. In the MNB's target system, these two aspects complement each other to facilitate the sound, reliable operation of the financial system. The fundamental principles define expectations regarding the structure and sale of the product, and the role of the tax incentive.

In terms of product structure, the MNB expects simple and transparent structures, with customer needs already taken into account during product development. Sales must be geared towards finding the right contract for the customer suited to its needs, and the insurance company's incentive system must foster the long-term maintenance of contracts. The advisory activities provided by intermediaries must also support this. The tax incentive must be geared towards increasing the customer's savings, and the insurance company must not have an interest in seeing the contract terminated prior to expiry.

DEFINING PENSION INSURANCES

Risks to be covered

The Act on Personal Income Tax defines pension insurance as life insurance where the insured event:

1. is the death of the insured, or
2. obtaining eligibility for pension benefits as per the legal regulation on retirement provisions paid by social insurance, or
3. at least a 40 per cent damage to one's health condition, or
4. reaching the retirement age specified in the contract in accordance with the legal regulations in force at the time of entering into the contract.

An additional condition is that 10 years must pass between the conclusion of the contract and its fulfilment, unless:

- payment occurs due to death or disability
- the insurance company's performance is not a decreasing annuity and the annuity is paid until the end of the tenth year of disbursement or the death of the insured.

The wording of the legislation suggests that the correct interpretation is that materialisation of any of the above specified risks qualifies as an insured event in the case of the pension insurance product. In an opposite interpretation, any simple term life insurance would fit the definition, which is clearly not the legislator's intention.

Product structure

Good products and effective market operation are contingent upon the simplest possible structures and greatest transparency of the products. Initiating the unbundling of complex product fosters competition and transparency, and has already allowed costs to be slashed in several areas[2] simply by preventing service providers from concealing their costs behind complex product structures. In our case, unbundling refers to distinguishing the savings and other risk components of the product, and presenting separate rates for each of them. This solution makes the contents of the product and the price of each component clearer for the customer. This not only allows them to choose the product best fitted to their needs, but also allows the comparison of the rate components of the various schemes.

TAX INCENTIVES

Under the current scheme, the tax incentive does not take the form of an element decreasing the tax base, but as a state subsidy funded from the customer's taxes, making it unclear who ultimately benefits from the tax incentive. The main possibilities are:

1. The subsidy (or a portion thereof) ends up at the insurance company, improving its profitability. This takes place if the cost of the pension insurance product exceeds its yield.
2. A sub-case of the previous case consists of the subsidy (or a portion thereof) being used as commission for insurance intermediaries. This scenario applies if the commission impacts the fluctuations of the cost side of the cost-to-yield balance presented above in such a manner that the commission rises, rather than decreases as would be expected in case of such product, compared to the conventional degree, as a product back to by the state is easier to sell.
3. Support materialises entirely in the form of extra yield for customers.

It is not obvious which of the above scenarios materialises and in what combination; the realities may also differ from one insurance company to the next. In order to achieve the desired objective, the market needs to be nudged (Thaler–Sunstein, 2011). The objective is clearly to see the customer benefit from the tax allowance, which is the objective we strive for with our recommendation.

With a view to the above considerations, the recommendation states as a fundamental principal that the state subsidy in the form of the tax incentive is intended for the customer. To implement this, the MNB expects no other costs besides the asset-proportionate costs incurred by the management of assets to be deducted from the state subsidy and equal treatment to insurance premia in terms of the deduction of costs, furthermore defining limits on product pricing. For the sake of adequate transparency and due to any potential repayment obligations that may arise, it is necessary for the state subsidy received and the return realised on it to be distinctly stated across the entire term. A special ad hoc account could serve this purpose, or any other accounting solution based on which the received subsidy and its return can be stated. Based on this same principle, if the contract is terminated for a reason other than benefit payout, the redemption value should be 100 per cent in respect of the state subsidy and its return, as this revenue cannot be used to pay either commission or any other costs and it would therefore be unwarranted to define any lower redemption amount. This is also important due to the need to ensure the insurance company's interest in maintaining the contract. Taxation law sanctions (repayment of the subsidy received increased by an additional 20 per cent) represent a sufficiently dissuasive force, and there is no need for the insurance company to apply any further cost deduction to the customer.

BENEFITS

General information

Pension, as a form of old-age income, best serves its objectives in the form of regular payments paid lifelong, in other words the depletion of funds accumulated during the beneficiary's active years must by default be distributed over its entire remaining life expectancy, as the chances of accumulating new capital or accessing new sources of income decrease as age progresses. At the same time, in the case of supplementary pensions, the role of other pension system elements and the income stemming from such must be taken into account, as well as the exact amount of supplementary pension funds accumulated to be able to accurately define its objective. In Hungary, old-age livelihood is mainly ensured by social security pensions in the form of monthly payments indexed to inflation, which thus continuously maintain their absolute purchasing power. Supplementary pensions cannot therefore have the objective of ensuring minimum livelihood or even

[2] For instance in the field of telecommunications, where several states have enforced the unbundling of complex packages (The Economist, 2014).

partially replacing social security, and thus do not warrant excessively strict requirements. Ensuring old-age livelihood at the highest standard can be achieved in several manners, and old-age security or the perception of such security can be achieved merely with the existence of accumulated wealth.

This is why when formulating the recommendation, a flexible proposal was outlined, calling for the market introduction of products capable of serving the broadest possible range of customer needs and requirements.

We feel that the service rendered should be primarily defined as a function of the accumulated funds. The recommendation is based on the premise that sufficient funds will be accumulated over the long term (i.e. primarily if savings are set aside from a relatively young age) to enable the payment of a meaningful annuity. The default recommendation is thus to use the amount in the form of a lifelong annuity furnishing regular income (discussed in depth later in this article).

It is also recommended to delay the depletion of accumulated funds in the case of lower principal amounts as well, but extending it over the entire lifetime would reduce the annuities payments to very small amounts. This would logically present a temporary annuity as an option, but this scheme is certainly not suitable for pension insurance, as it would consist of customers waiving the option of potential bequest for a slightly higher annuity amount, which is one of the main obstacles to the spread of life annuities. The main issue with temporary annuities is they end right when they would be most needed. This could be avoided if these principals were paid out at a more advanced age, however few heed this advice, and therefore as a compromise we recommended fixed-term phased withdrawal for both customers and service providers.

Lump sum withdrawal is generally not a preferred solution for savings geared towards supporting old-age livelihood due to the risk of their quick depletion; however, some exceptions – fundamentally three types – can be accepted. The first scenario is when the amount of savings is high and there is no need or requirement for high annuities. In this case, the lump sum withdrawal of part of the amount is capable of fulfilling the customer's needs without jeopardising its sufficient long-term continuous income, on condition that it does not exceed 30-50 per cent thereof. Another possible scenario is the materialisation of a very firm and justified customer need/requirement, for instance with a view to moving into a retirement home or plans by the customer to purchase an annuity from another insurance company. In the third scenario, the amount of savings is so low that they cannot fund even a medium-term fixed term annuity (i.e. annuity payments would also be low in this case as well).

Life annuities

Based on the foregoing, we believe that pension insurance should be fundamentally provided and collected in the form of life annuities. The global annuities market, however, shows a gloomy picture (even gloomier if we limit ourselves to the Hungarian annuities market). Looking at this sector, significant (but nowhere truly large) voluntary life annuity markets can only be identified in a handful of countries. The mandatory annuities market is larger, but this approach (i.e. mandatory annuitisation) is not an option under consideration in the field of Hungarian pension insurance.

In the case of voluntary life annuities – in contrast to mandatory ones – customers have the power to decide whether or not to purchase a life annuity, when they receive their pension benefit which allows for the purchase of an annuity. Their decisions are primarily shaped by the desire to avoid two things:

1. receiving a lower expected value as an annuity than what they paid as a lump sum premium
2. seeing the unused part (or a large portion thereof) of their funds inherited by a non-relative in the event of their relatively early death

Both of these considerations dissuade many people from opting for a life annuity, which explains the small size of voluntary annuities markets. The former leads to a self-generating process. Those who are certain that they will not each an advanced age or uncertain whether they will live long enough will not opt for an annuity, providing for a sort of auto-selection among the insured. For this reason, insurance companies can expect the mortality composition of individuals purchasing annuities to be better compared to the overall population (but worse from their perspective), increasing annuity premia. This however, will dissuade even more rationally thinking individuals from the annuities market, leading to a further rise in premia, etc. This will result in involuntary annuities premia being so high that they will only be worthwhile for a minority certain to look forward to a long life expectancy.

The second consideration will even dissuade many from this minority from the annuities market, as even retirees with high life expectancy can die young. Most people like to adopt the following pattern of thought: "I do not know what I will spend my pension principal on. If I live long enough, I will spend it entirely on myself and deplete it, otherwise I will bequeath it to my children and grandchildren." Purchasing an immediate life insurance annuity calls for abandoning this presumptive thinking and making a firm decision to spend pension savings on oneself – a decision few are capable of.

It is not only customers who are hesitant; insurance companies are also reluctant to sell life annuities. The main issue is that the life expectancy of people and specifically annuitants is gradually rising at a rate that is not known, constituting the longevity issue. In other words, the premia collected during the early period of the term may not be enough to cover the annuities paid out to insurance holders reaching an advanced age.

Several attempts have been made to address these issues. One of them is so-called impaired annuities, which provide a discount to insurance holders capable of proving that they are sick/disabled, and therefore have a shorter life expectancy. This could make annuitisation attractive for this group, in contrast to a scenario where a uniform premium table is applied. At the same time, this solution is recommended for markets which have thriving annuity markets, which is not the case in Hungary.

Another solution is to try to reach a compromise. Even customers wary of annuities can easily admit that their excessive longevity, while otherwise desirable and positive, could have catastrophic consequences for them, as their financial resources are likely to be entirely used up, and their physical and mental condition unsuitable for finding new resources. This warrants a sort of financial "catastrophe coverage" for everyone, in other words a way to secure sufficient supplementary income at a very advanced age, should they live that long. This does not require the purchase of an immediate life annuity using the totality of one's funds, which would give rise to the issues mentioned above. It would suffice for them to purchase a long-term deferred annuity using a smaller portion of their funds, which may not even begin if the deferred date were not reached, but would very much come in handy if it were.

For the most part, this solution addresses the two reasons giving rise to customer wariness and the issue facing insurance companies, as the larger portion of pension principal can be bequeathed, the expected annuity payout will be lower, and thus the premium and its potential divergences and the longevity issue facing insurance companies will also be smaller in the case of an expectedly much shorter annuity compared to a longer one.

This type of solution is theoretically not novel, but it remains relatively obscure and should therefore be highlighted for stakeholders (i.e. customers and service providers). The Canadian Moshe Milevsky proposed "Advanced-Life Delayed Annuities" (ALDA) (Milevsky, 2004) in case of involuntary annuities, although he also cites earlier origins. The OECD started promoting the concept in 2008 in relation to mandatory annuities (Antolin, 2008), which became a quasi-official recommendation for countries having implemented a recapitalised pension reform and approaching the annuitisation phase. József Banyár (Banyár, 2012) promoted the solution in Hungary, and Kolos Ágoston (Ágoston, 2008) also discovered it independently.

The question is what portion of pension principal should be used to purchase a deferred annuity, and why the MNB recommends allocating 25–30 per cent for this purpose? There is a self-explanatory answer to this: pension principal should be distributed (ignoring indexation) in such a manner that we receive equal monthly annuities for the rest of our lives, with the life annuity portion only paid out from an advanced age.

Quantitatively speaking, under this recommendation, the pension principal (C) should not be converted to the annuity based on the initial annuity insurance formula[3]

$$\ddot{a}_x$$

where the annual annuity amount would be

$$\frac{C}{\ddot{a}_x}$$

(paid out in 12 instalments in case of an annual annuity), instead distributing this principle over the entire lifetime, but with the insurance holder only committing to annuitisation from an advanced age (x+n). The annuity amount worth purchasing can be calculated using the following formula

$$\frac{C}{\ddot{a}_{\overline{n}|} + {}_{n|}\ddot{a}_x} \qquad {}^{4,\,5}$$

This formula is officially the formula of a guarantee period life annuity at the beginning (until year n), where in the event of the insurance holder's death in under n years, the remaining annuity is paid to the heirs for the remaining period until n (as a lump sum or an annuity, a mere technical issue), but if the insurance holder survives the term, a deferred annuity of the same amount is launched.

The guarantee period annuity can be broken down into two annuities: an annuity certain of n years, where principal amounts to

$$\frac{\ddot{a}_{\overline{n}|}}{\ddot{a}_{\overline{n}|} + {}_{n|}\ddot{a}_x} \cdot C$$

[3] $\ddot{a}_x$ meaning: net (exclusive of costs) present value of HUF 1 of the life-contingent annuity of an insurance holder of age x, i.e. its net premium.
[4] ${}_n\ddot{a}_x$ meaning: net premium for the life annuity deferred by n years, purchased by the insurance holder at age x, with payout starting at age x+n – provided that the insurance holder survives until that age.
[5] $\ddot{a}_n$ meaning: formula for the annuity certain for n years ("phased withdrawal"): guaranteed for n years, but only until then.

and a deferred annuity purchased using the remaining portion

$$\frac{{}_{n|}\ddot{a}_{x}}{\ddot{a}_{\overline{n}|}+{}_{n|}\ddot{a}_{x}}\cdot C$$

It is actually enough to purchase this annuity at retirement using the smaller portion of principal, as holders are capable of allocating the greater portion of their funds for a foreseeable period of n years

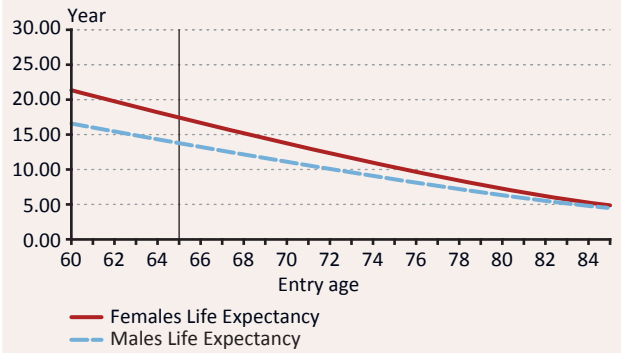
$$\frac{\ddot{a}_{\overline{n}|}}{\ddot{a}_{\overline{n}|}+{}_{n|}\ddot{a}_{x}}\cdot C$$

for a foreseeable period of n years.

A further question is the value of n. Logically, it is relatively high, but not too high. The OECD recommends that x+n should be approximately 80-85 years.

The Banyár (2012) paper contains calculations illustrating how this translates relatively to annuity premia. The following can be said on the matter approached from a different perspective. Based on the 2009 population mortality table, Chart 1 shows life expectancy at various ages.

Chart 1
Life expectancy (2009 population mortality table)



Source: CSO.

At first glance, this also represents life annuity premia with a zero per cent technical interest rate.[6] For instance a woman has a life expectancy of 17.63 years at age 65, which means that net principal (excluding service provider charges) of 10 000*12*17.63 = HUF 2,115,600 must be accumulated.

In reality, premia will be higher than this, as individuals opting for annuities have better life prospects compared to the total population, as mentioned above. The premia on guarantee period life annuities (applied to a HUF 1 monthly annuity) is also higher, as shown by Table 1.

Table 1
Life expectancies and premiums of guarantee period life annuities

Age of entry	65
Remaining male life expectancy	13.73
Remaining female life expectancy	17.63
Guarantee period annuity premium	
Male – until age 80	17.94
Male – until age 85	21.15
Female – until age 80	20.08
Female – until age 85	22.27

However, if we look at the ratio of "catastrophe coverage" within the guarantee period annuity, i.e. deferred annuity, we get low relative values according to Table 2

Table 2
Proportion of the deferred annuity premium within the guarantee period annuity premium

Age of entry	65
Male – from age 80	16%
Male – from age 85	5%
Female – from age 80	25%
Female – from age 85	10%

Therefore the recommended strategy seems like a reasonable compromise based on the figures as well, even if we have to take into account that:

- only unisex annuities can be determined at present, with no differentiation allowed between men and women. This means that the uniform annuity premium is situated between the premia for the two genders, but is somewhat closer to the higher value defined for women (who are predominant in this age bracket)
- annuitants feature a higher proportion of individuals reaching an advanced age, therefore actual ratios will be higher than those specified above.

A manner of thinking differing from the above is also possible. We can also say that it is irrelevant whether the annuity provided by "catastrophe coverage" is identical to the annuity certain received until then. In this case, we divide the pension principal among the two objectives and look at the amount of annuity obtained under these conditions. We further fine-tuned the calculations compared to the above by taking into account the fact that annuitants' life expectancy is higher compared to the population mortality table, and thus tried to present seemingly realistic values.

[6] This is recommended to preserve the value of the annuity, i.e. featuring indexation using a relatively high index. The premium can be decreased by increasing the interest rate, but this results in increasingly smaller value allocation.

Table 3
Size and proportion of the annuity certain and life annuity in case of different distribution of capital

Annuity certain

		Principal ratio of the annuity certain						
		60%	65%	70%	75%	80%	85%	90%
Switching age	75	50,000	54,167	58,333	62,500	66,667	70,833	75,000
	80	33,333	36,111	38,889	41,667	44,444	47,222	50,000
	85	25,000	27,083	29,167	31,250	33,333	35,417	37,500

Life annuity

		Principal ratio of the annuity certain						
		60%	65%	70%	75%	80%	85%	90%
Switching age	75	32,174	28,152	24,130	20,109	16,087	12,065	8,043
	80	51,608	45,157	38,706	32,255	25,804	19,353	12,902
	85	100,020	87,518	75,015	62,513	50,010	37,508	25,005

Proportion

		Principal ratio of the annuity certain						
		60%	65%	70%	75%	80%	85%	90%
Switching age	75	1.55	1.92	2.42	3.11	4.14	5.87	9.32
	80	0.65	0.80	1.00	1.29	1.72	2.44	3.88
	85	0.25	0.31	0.39	0.50	0.67	0.94	1.50

The distribution of principal amount and the choice of switching age fundamentally impact the initial (fixed) annuity and the life annuity amount. For instance considering a zero per cent technical interest rate and HUF 10,000,000 initial principal, we obtained the annuity values specified in Table 3 in the event of that 60, 65, 70, 75, 80 per cent of the initial principal is used for the annuity certain and the life annuity starts at age 75, 80, 85. As a point of departure, we took into account a realistic unisex mortality figure: (in line with the composition of over-65 age group) considering a 30 per cent male and a 70 per cent female mortality rate, and considering mortality 30 per cent lower compared to the population mortality.

Due to the application of a zero per cent technical interest, the values listed in Table 3 are expressed in real terms (assuming that the yield credited to the annuitant is equal to inflation), allowing for a real comparison.

Fund distribution and entry age parameters should be chosen so as to yield an attractive initial annuity while keeping life annuity from dipping too low. In the case of a high switching age, we do not receive a high initial annuity even if a large portion of funds are allocated to the initial annuity period. If we expect the initial annuity to be at least 40,000 and life annuity to be at least 25,000, then a distribution of funds of 60–65 per cent is recommended for life annuity starting at age 75 and distribution of 75 per cent in the case of a life annuity starting at age 80.

The picture is greatly nuanced by the management of longevity risk by the insurance company and its generation of the unisex mortality table used to define annuities. Changes in mortality assumptions do not affect annuities certain, but strongly impact life annuities (Table 4).

Table 4
The effect of different assumptions on mortality to the value of deferred life annuity

		75 years/60%	75 years/65%	80 years/75%
Annuity certain		**50,000**	**54,167**	**41,667**
Life annuity	**50% ffi / 0.75**	35,705	31,242	36,876
	30% ffi / 0.75	33,669	29,460	34,334
	30% ffi / 0.5	26,349	23,055	24,622

For instance, the value of a life annuity is not significantly impacted by the upward weighting of female mortality from 50-50 per cent to the actual distribution (30-70 per cent), however the assumption of far better life prospects for annuitants (the probability of death is not merely 75, but 50 per cent of that of the total population) results in a significant decline.

SPECIAL RECOMMENDATIONS FOR UNIT LINKED LIFE INSURANCES

Life-cycle approach investments

One of the keys to the success of savings geared towards pensions is the right investment. This is due to the fact that a pension is the longest-term investment objective, featuring a savings cycle ranging from ten years up to the total active portion of a career, i.e. 40-45 years. Savings periods shorter than ten years are generally not considered as being purely geared towards pension, and are instead late savings of the final period, which, while certainly being very useful, likely only enable the accumulation of smaller amounts of funds than needed to ensure sufficient (supplementary) pension, and thus differ little from general purpose saving in terms of their nature. It is no coincidence that savings periods of at least ten years are defined as the condition for tax incentive eligibility.

Insurance companies fundamentally offer two types of products in terms of investment risk: alongside traditional products, unit linked [UL] insurance products also appeared on the Hungarian market approximately 20 years ago. In the case of traditional insurance, the insurance company guarantees a return to customers equivalent to technical interest through the balance of the premium and the pledged insurance benefit. In order to foster safe operation and avoid excessive pledges, the legislator has capped technical interest (currently at 2.9 per cent), with the majority of insurance companies offering products featuring technical interest rates of around 2 per cent or less. Insurance companies generally pay back at least 80 per cent of return over and above the technical interest rate, the so-called excess return.[7] In the case of traditional products, the insurance company assumes the investment risk up to the technical interest rate level. This is a predictable and safe solution for the customer. In order to safely generate the technical interest, insurance companies generally strive to invest the funds in investments featuring the lowest possible risk, and thus the excess return achieved is likely to be low even during good periods. In the longer run, however, a higher return can be attained with a well-chosen investment structure.

Unit linked insurance products were created specifically for this purpose. In their case, the customer bears the investment risk and capital can be fully invested in assets best suited to the customer's needs and life situation. Practical experience, however, shows that customers generally have a hard time assessing the risk they are able to safely undertake and are thus unable to choose the right assets. Another key factor is that in the case of long-term investments, not only does in investment composition need to be adjusted to market conditions, but the level of risk must also be adjusted to the remaining horizon. The recommendation therefore suggests that pension insurances follow the so-called life-cycle approach. This approach consists of continuously adjusting the portfolio risk level to the time remaining until pensionable age. This represents a higher level of risk towards the beginning of the term, gradually declining levels during the term and a lower level of risk towards the end of the term. The underlying thought is that higher risk is paired with greater yield potential if the assets are chosen correctly (or rather, it should only be undertaken under this condition). As the investment is for the longer term, high volatility is less relevant and smoothing is unnecessary due to uniformity. The so-called average cost effect also mitigates risk, as the cashflow of the savings is continuous and received in small portions; therefore assets are purchased in small quantities at different asset prices. Once risk needs to be reduced as age advances, the assets can be regrouped in small volumes following a long transition, keeping the impact of asset price fluctuations on the investment far lower. At the beginning of the period, higher risk can be undertaken on the lower capital, while towards the end of the period, it is no longer worthwhile to undertake high risk on the accumulated capital.

A life-cycle approach to investment structure can be implemented in several manners. A target date portfolio is an obvious solution, where the asset manager optimises the return on investment to the date of reaching pensionable age. Target date portfolios with maturities of ten or more years are rare in Hungary, and there is little experience on such long terms. If the customer nevertheless opts for such a portfolio, the lowest possible risk (e.g. money market funds, bank deposits, etc.) can be undertaken for the period between the maturity date and the date of reaching pensionable age. Target-date funds with guarantee are a specific type of target date portfolio, where either the insurance company or the asset manager guarantees the yield at pensionable age. While in the case of traditional products, insurance companies must continuously generate the technical interest rate,[8] in the case of target-date funds with guarantee this only applies to the target date. As the savings are for the long term, the impact of cyclicality can be easily managed and a guarantee approaching that of traditional products can be provided at a lower cost.

[7] Payback of 80 per cent is defined by legislation, but applies to the entire insurance company.
[8] In the event of any volatility in return, the pledged excess return must be paid out in a good year even if return fell short of technical interest in previous years.

An adequate investment composition can be crafted using the current asset funds used by insurance companies. This merely requires the insurance company to clearly and straightforwardly categorise its asset funds, indicating which ones it recommends investing in for which age bracket, alongside their risk profile. It is therefore advisable to recommend a limited number of asset funds with clearly defined risk levels to allow customers to easily assess their options and simply choose the best-fitting investment composition. For customers seeking greater security, guaranteed-yield asset funds can also be recommended for certain periods.

Costs – Total Cost Indicator (TCI)

The Association of Hungarian Insurance Companies drew up its TCI Charter in 2009 (MABISZ, 2009–2014) with a view to reinforcing consumer confidence in the insurance market at the earlier initiative of the supervisory authority (HFSA, 2007), but following a different approach. The calculation and publication of the TCI Charter is not compulsory, and its adoption is voluntary, but every insurance company offering unit linked life insurance has adopted it.

The TCI presents the costs borne by the customer as a minimum yield to be continuously achieved by the product's underlying asset funds throughout the entire term of the insurance contract (i.e. prior to the deduction of asset management costs) in order for the customer to nominally receive the amount of premia paid according to the original premium requirement as the amount at maturity (or the redemption amount used to calculate TCI at specific points in time in the absence of adequate maturity values).

The actual (a posteriori) cost indicator of a contract depends strongly on the events that occurred (specific contract parameters, customer behaviour, insured events, asset fund performance, etc.), over and above the product parameters. The TCI to be published applies to one product. The indicator values must be calculated and published by insurance companies for several model points, using the assumption defined in the TCI regulations[9]. The assumptions do not cover every product parameter, therefore model points can result in a TCI band in practice.

The insurance companies adopting the TCI Charter committed to capping their cost deductions by keeping their product TCIs within the bands defined by them and specifically issuing a warning to customers if the specific circumstances of a product do not allow this. Bands defined as targets:

- Up to a term of 10 years: 4.75–6.75 per cent
- At 15 years: 4.25–6.25 per cent
- At 20 years: 3.75–5.75 per cent

Pursuant to the TCI Charter, pension insurance indicators must be calculated using an entry age of 55, 50 and 45 rather than 36, and are referred to as TCI*.

The TCI Charter is based on self-regulation and represents a great step forward in terms of transparency, but its impact is limited stemming from its nature. An examination of the pension insurance product market reveals that some of the products remained above this band (ranging between 1.03 and 7.30 per cent at the lower bound and 2.95 and 9.55 per cent at the upper bound in May 2014).

The performance of pension insurance can be measured retrospectively using the internal rate of return of contract cashflows. Expected performance is indicated by the return H that must continuously be generated by an asset fund for a contract with a specific TCI (more specifically, cost structure) to achieve return h on the contract. Pursuant to the definition of TCI, a return of h = 0% requires H = TCI.

It is easy to see that if the insurance company only deducts f asset-proportionate costs, the return h can be attained with H = (1 + TCI)* (1 + h) – 1, where (TCI = 1 / (1 – f) – 1). If other costs deductions occur (e.g. initial costs) the above equation does not apply, but the application of models indicate that in order to achieve the return h on the contract, an asset fund return only marginally higher than H = (1 + TCI)* (1 + h) – 1 is needed.

The state subsidy amounting to 20 per cent of the premium paid[10] is an important factor when purchasing pension insurance. These tax credits increase the internal rate of return of the contract to different degrees as a function of the term (assuming that the tax credit and related eligibility are continuously maintained throughout the entire term), in other words a lower asset fund return (H) is needed to attain the same contract return (h). The longer the term, the smaller the impact. This somewhat offsets the impact consisting of higher TCI generally being associated with shorter terms, as asset-proportionate initial costs are distributed over a shorter period when calculating internal rate of return.

[9] For instance: 35-year-old insured, only the compulsory insurance services, average insurance premium, annual premium payment through direct debit, term: 10, 15, 20 years (5, 10, 20 years in case of single premium insurance), with the asset management costs of the underlying asset fund also needing to be factored in over and above cost deductions, but not taxes and commissions.

[10] We assume that the other conditions for this (e.g. limits) are met.

Table 5
Asset fund return H ensuring return h on the contract at one model point

h	0	1%	3%	6%
H	3,399%	4,457%	6,580%	9,777%
(1 + TCI) * (1 + h) – 1	3,399%	4,433%	6,501%	9,603%

Table 6
Impact of tax credit on the asset fund return H ensuring a return h on the contract at one model point

	h	0%	1%	3%	6%
10 years	without 20%	5,51%	6,61%	8,82%	12,14%
	with 20%	1,01%	2,15%	4,43%	7,84%
15 years	without 20%	3,40%	4,46%	6,58%	9,78%
	with 20%	0,51%	1,62%	3,83%	7,13%
20 years	without 20%	2,60%	3,64%	5,72%	8,86%
	with 20%	0,48%	1,57%	3,74%	6,98%

When calculating the TCI, cost deductions must include the premia deducted on minimum mandatory risks, but not the expected benefit. This distorts the value of the indicator upwards; in reality, only the premium portion (expenses and commissions) exceeding the value of actual risk should be factored in. This distortionary effect (see the divergence of the first row of Table 7 from the adequate values) depends strongly on the term (it is higher in case of shorter terms) and the minimum mandatorily risk.

Table 7
Distortionary effect of mortality risk on the TCI at one model point

Term	10 years	15 years	20 years
No risk	5.51%	3.40%	2.60%
Sum insured = annual premium	6.13%	3.73%	2.80%
Sum insured = 5 * annual premium	8.79%	5.10%	3.63%

Note: Sum of the service and invoice value and sum insured in the event of death.

If customers opt for higher risk compared to the minimally defined level, the indicator may be distorted downwards by the assumption that only minimally compulsory risks must be taken into account in the case of particularly high expenses and commissions.[11] The distortion depends largely on the ratio represented by the value of the "actual" risk and the ratio of expenses and commissions within the expense deducted as the risk premium, and how the insurance company defines the unisex mortality table serving as the basis of "actual" risk. Whether the benefit rendered by the insurance company in the event of death is provided over and above the account balance or as the maximum of the sum insured and the account balance is also relevant.

The TCI Charter relies on the assumption that the contract will not be terminated earlier based on either an insured event or redemption. Although redemption is an important and integral option of a life insurance policy, it cannot be conciliated with the fundamental objective of pension insurance, which provides the grounds for the state subsidy. Therefore, we can ignore this effect in terms of the ("adjusted") TCI factoring in the probability of cash flows. Taking into account termination triggered by insured events cannot materially change the value of the TCI if there is no mortality risk at all. Otherwise, the adjusted TCI will understandably be lower and the difference proportionally smaller, the higher the expenses and commissions incorporated into the risk premium.

The TCI is defined per product as per the TIC Charter. Due to the method used for defining TCI and the divergences among specific contracts (even if only in terms of the sums insured), the yields achieved on individual contracts may differ substantially for the same asset fund return and product TCI. The product's TCI is a good point of reference for defining the

[11] For instance, if the insurance company minimally pays out the annual premium over and above the account balance to the beneficiary in the event of the death of the insurance holder, the TCI of 3.4 per cent jumps to 4.06 per cent at the 15-year term model point in the case of expenses and commissions of 66.7 per cent. However, if the insurance holder opts for an insured sun of 5-fold the annual premium, the TCI rises by 3.58 per cent, approximately two-thirds of which stems from the elevated expenses and commissions. In other words, if the TCI were to include only cost components corresponding to expenses and commissions, a higher sum insured would result in a contract with a higher TCI compared to the TCI calculated according to the Charter.

Table 8
Impact of mortality risk features on TCI distortion at one model point
(15-year term)

		Sum insured			
Mortality table	**Expenses and commissions***	**none**	**annual premium**	**5 * annual premium**	**20 * annual premium**
50% male	**0%**	3.40%	3.62%	4.51%	8.35%
Benefit and account balance and maximum sum insured		3.40%	3.42%	3.65%	6.82%
80% male	**0%**	3.40%	3.68%	4.83%	10.02%
50% male	**33.3%**	3.40%	3.73%	5.10%	11.52%
50% male	**66.7%**	3.40%	4.06%	6.98%	32.48%

**As a percentage of the gross premium.*
***The benefit in the event of death applies over and above the account balance in the other rows of the table.*

Table 9
("Adjusted") TCIs at one model point taking into account the probability of cashflows

	Term	**10 years**	**15 years**	**20 years**
No risk	Normal	5.51%	3.40%	2.60%
	Adjusted	5.55%	3.41%	2.59%
Sum insured = 5 * annual premium, 0% expenses and commissions	Normal	7.64%	4.51%	3.28%
	Adjusted	6.03%	3.60%	2.68%
Sum insured = 5 * annual premium, 66.7% expenses and commissions	Normal	12.72%	6.98%	4.71%
	Adjusted	11.22%	6.14%	4.16%

expected performance of the contract, but is far from being sufficient.

Taking into account of the above calculations and considerations, the MNB pursues a slightly different approach compared to the TCI Charter. The TCI* defined in the TCI Charter covers various different cases, one of which is pension insurance. For the sake of differentiation and ease of management, it introduces the designation TCI^{ny}, with the following criteria.

When calculating TCI, the value that can be achieved with at least one underlying asset fund (which can even be a low-cost money market fund) is taken into account. The lower threshold can be breached by two percentage points with no justification needed, due to asset funds with differing costs. The TCI can exceed the threshold if a short written justification (e.g. the product is a pension insurance carrying high risk, with regard to the management costs of one or several sophisticated asset funds over and above insurance company charges) is provided.

The MNB recommendation defines the following recommended values as the upper threshold for TCI^{ny}:

- Up to a term of 10 years: 4.25% (instead of the current TCI* of 4.75–6.75%)
- At 15 years: 3.95% (instead of the current TCI* of 4.25–6.25%)
- At 20 years: 3.5% (instead of the current TCI* of 3.75–5.75%)

Instead of band limits, the MNB defines specific values. The TCI Charter regards the customer's decision as arbitrary and defines band limits based on the available asset fund costs. Under the life-cycle approach proposed in the recommendation, the portfolios are linked to specific periods and are also optimally based on government securities adapted to maturity, supplemented in the initial period by higher risk securities with greater yield potential, featuring higher cost levels. As time progresses, the ratio of lower-cost, safer and more balanced yield investments increases. The average cost of should be taken into account for the investment costs entire life cycle. There is no need to determine band limits when defining TCI^{ny}, only specific values.

The defined values must be attained using government securities adapted to the term, contrary to the Charter, which allows their attainment using any asset fund. The average cost of investment within the life-cycle approach can be easily compared to the costs of government securities. In the recommended model, a large portion of investments are placed in government securities with terms adapted to maturity to begin with. Assets with higher yield potential were recommended for the initial period alongside the government securities, with higher costs of investment, representing smaller asset volumes at first. This surplus is balanced out by the less risky assets opted for towards the

end of the period, which are cheaper and feature lower costs applied to far greater savings towards the end of the period. It would be unwarranted to adjust the TCI^{ny} value to the highest values attainable by money market funds, as the latter are short-term assets and thus unfit for taking advantage of the benefits offered by the long-term nature of an investment.

There is also leeway for a 2 percentage point divergence in the case of the TCI^{ny}. In contrast to the TCI*, however, this divergence cannot take on any form, but only in a quantified manner and only if the underlying asset fund qualifies as complex and has higher-than-average yield potential, is return- or capital-guaranteed or is warranted by the insurance risk carried by the product.

The TCI^{ny} value was defined based on the fact that life-cycle approach investments have somewhat higher yield potential compared to the return on long-term government securities. Assuming a 3 per cent medium-term inflation target, a TCI of 3–4 per cent could be sufficient for preserving value. An important element is that both TCI and TCI^{ny} include the price of the risk component, which must also be factored into pricing. We also took into account the higher impact of the tax incentive in the case of a 10-year term compared to longer terms, the reduced opportunities for spreading out costs incurred by the insurance company and the higher price of risk components as age progresses when defining the recommended TCI^{ny} value.

SALES

The right product is essential for reinforcing customer confidence, but is not enough in and of itself. The success of pension insurance sales hinges significantly on the employee or insurance intermediary taking part in the sales process. The MNB has therefore defined its expectations vis-à-vis these parties. One of the central elements of the recommendation stipulates that pension insurance products can only be sold by persons who are familiar with the specific features of pension products and possess adequate investment know-how. In relation to unit linked pension insurance, it is imperative that customers be provided suitable information which facilitates a well-informed decision. In order to prevent fraud and to establish the appropriate cost structure, the MNB recommends so-called “drop-by-drop” commission payout, were the amount of commission paid does not exceed the premium amount received. A minimum solution consists of converging towards the regulation valid from 1 January 2015, with further divergences towards classic “drop-by-drop” commission payout within such a framework under specific circumstances or the maintenance of commission rates allowing the attainment of the target TCI. When defining commission levels, it should also be kept in mind that the product is more easily marketable compared to average life insurance thanks to the associated tax incentive.

Due to the newly introduced tax incentive, the customer may be better off purchasing insurance under the new terms and conditions, even if they can only terminate their earlier contract at a lower redemption value. This calls for an individual decision and entirely personalised analysis in every case. The MNB states that this is necessary to allow pension insurance to appear as a new savings component; therefore, a practice consisting of regrouping existing savings is not supported.

A key expectation of intermediaries is that they recommend products on the basis of customer needs that satisfy the requirements defined in the recommendation. If a customer has unique needs that cannot be satisfied with a product on the market that complies with the recommendation, the reason therefore must be clearly noted in the context of the needs assessment procedure. Similarly, the choice of a product featuring a higher TCI than the default recommended maximum must also be justified. In the context of assessment, failure to provide these justifications qualifies as a professional error by the intermediary and may result in the launch of legal enforcement procedures.

THE RECOMMENDATION AS A TOOL

The period between the promulgation of the tax incentive in legislation and its entry into force was extremely short, leaving very little time for both insurance companies and the supervisory authority, as applicants of the law, to prepare for the change. This resulted in insurance companies implementing product development by modifying existing products to the smallest extent necessary. The MNB has identified a need for providing assistance as soon as possible to market participants to enable the creation of products best suited to state and customer expectations.

These expectations can be formally formulated in the form of a recommendation supplemented by informal tools (reconciliations, consultations). Recommendation is an excellent tool for shaping market participants’ behaviour, leaving them ample leeway while providing a clear point of reference. The recommendation cannot be enforced through legal avenues, but this is not necessary. In extreme cases, indirect instruments are available, however the reconciliation mechanisms with stakeholders offer a guarantee that market participants will identify with the fundamental principles and values defined and adapt their conduct to such.

The recommendation is novel in several different ways. The MNB has defined the reinforcement of consumer

protection and the dissemination of a preventive approach as clear objectives alongside prudential considerations. This recommendation represents the first instance where the MNB has defined product-level requirements with a view to seeing new portfolios built on contracts strongly adapted to customer needs and carrying no systemic or market risk, conducive to restoring consumers' shaken confidence.

Thanks to consultations with insurance sector, intermediary and trade organisations and the competent areas of the Ministry for National Economy and the incorporation of comments whenever possible, the application of a stricter set of instruments can be avoided, and broad compliance with the recommendation is likely. The MNB will measure implementation of the recommendation and may issue amendments or recommendations for further legislation depending on the results.

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László Bodnár, Miklós Luspay and Annamária Madarász: The effect on payments of the conversion of MNB bills into deposits

In April 2014, a decision was made at the central bank to convert the two-week MNB bills into deposits as of August 2014 with the objective of "channelling HUF liquidity from the two-week MNB bills to government securities".[1] *This also means that this short-term instrument is removed from the pool of eligible collateral accepted by the MNB, and thus credit institutions will no longer be able to use it for the execution of payment transactions; i.e. as collateral for fulfilling their clients' payment orders. Since the two-week MNB bill comprises the bulk (nearly 40 per cent) of the securities pledged by banks as collateral, the central bank decision will definitely require some adjustment on the part of credit institutions if they wish to maintain the level of liquidity previously available for them in the payment systems. In our paper, we examine the possible adjustments of banking sector participants in response to the conversion of the MNB bill into deposits in terms of liquidity and, based on historical data, we attempt to analyse the impact on credit institutions resulting from the removal of the MNB bill from the pool of eligible collateral.*

LIQUIDITY

Components of liquidity: account balance and overdraft facility

In Hungary, credit institutions basically use two payment systems to execute their payments and the payment orders of their clients. The real-time gross settlement system (VIBER or Hungarian RTGS) is used for high-value, urgent forint transfers, while the Interbank Clearing System (ICS) is used for small-value forint transfers. In the settlement of VIBER transactions, collateral is secured on a gross basis; in other words, the bank involved must provide collateral for the entire outgoing transaction. In addition to high-value, time-critical transactions, the intraday turnover of the ICS is also cleared in VIBER, along with those transactions of night-time turnover, which are settled in an extraordinary settlement cycle due to the queuing of items lacking coverage. Furthermore, VIBER is also used for settling the cash leg of credit institutions' securities transactions executed in the securities clearing and settlement system operated by the Central Clearing House and Depository (KELER) Group.

Credit institutions must have sufficient liquidity so that they can execute their payment orders in VIBER. This liquidity is ensured by the account money (account balance) held on their accounts with the MNB and by the overdraft facility provided to them. Payments are executed primarily by utilising the account balance of the VIBER participant. The account balance is affected by several factors, including the required reserve ratio chosen by the credit institution. Multiplying the required reserve ratio – which can be freely chosen between 2 per cent and 5 per cent – by the reserve base of the credit institution gives the reserve requirement. This is the minimum amount that must be held by the specific credit institution on its MNB account. Banks must meet this mandatory minimum as a monthly average; i.e. they must ensure that the average of their end-of-day closing balances reaches this statutory minimum in the given month. Hence this mechanism provides banks with a certain flexibility in a sense that they have more freedom in determining their account balances (and therefore the liquidity available for their payment transactions) over the course of a given month. Some banks, for example, hold a higher account balance than their selected reserve ratio (i.e. run a reserve surplus) at the beginning of the month, and adjust this surplus in the second half of the month (run a reserve deficit). Obviously, these behaviours affect banks' liquidity as well.

If a bank has insufficient funds on its MNB account to execute its payments, it may automatically obtain an intraday credit line (overdraft). In such cases, the bank's most important task

[1] http://english.mnb.hu/Root/Dokumentumtar/ENMNB/Sajtoszoba/mnben_sajtokozlemenyek/Banks_can_contribute_to_Hungary_s_self-financing_through_government_security_purchases_-_Background_material.pdf

is to settle the overdraft by the end of the day; otherwise it will become an overnight loan. And while the intraday credit line is practically free of charge with its price effectively being the opportunity cost of the pledged collateral, overnight loans are more expensive, and the bank in question incurs extra costs.

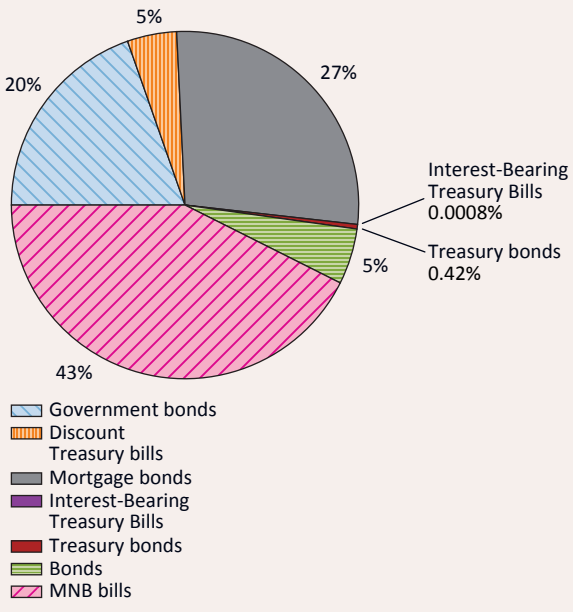
Banks may modify the available overdraft – and increase the level provided they still have sufficient amount of securities in their balance sheets to pledge – during the daytime VIBER business hours or, after the closure of VIBER, until 6:30 p.m. under normal business circumstances. Banks must initiate the modification of the overdraft facility with KELER – where the security register is maintained – and, following the verification of the securities side, KELER forwards the request to the MNB. This, however, is a time-consuming process, as the request for modification must run through the systems of both KELER and the MNB, which takes an average of 5 minutes per security type. This is particularly important when a VIBER member wishes to pledge different types of securities as the relevant processing takes place consecutively rather than concurrently, for each individual security type; consequently, the 5-minute lead time could in fact take much longer. Banks should bear this in mind especially if they are more overstretched from a liquidity management perspective. Still, by means of this mechanism, banks have an opportunity to supplement the liquidity needed for the execution of their daily turnover during the course of the business day if they have failed to estimate the required level of liquidity correctly.

If a bank does not have sufficient coverage – based on its account balance and overdraft facility – to execute a certain transaction, VIBER will place the payment orders in a queue. Verification of coverage takes place after the submission of financial transactions. During such verification, both the account balance and the intraday credit line are examined and checked whether these provide adequate amount of coverage for the execution of financial transactions. A bank may encounter a problem when liquidity management is unable to secure this coverage for the outgoing transaction during the clearing process, and thus the item is not settled immediately. In such cases, VIBER places the items in a queue. The order of these queued items can be modified by the VIBER participant though and as soon as the required coverage is available, the system begins to settle the items. If VIBER perceives a gridlock, it activates the automated gridlock resolution mechanism. Due to the complexity of the system, however, participants may be subject to network effects; i.e. if a credit institution fails to execute a transaction/transactions in time, the payments of another credit institution may also be subject to disruptions.

Main features of the overdraft facility and its collateral, the pledged securities

Coverage for the overdraft is provided by the securities pledged to the MNB. However, it is important to distinguish between the total pledged portfolio and the portfolio which can actually be used as coverage for the overdraft facility available for payment transactions. As a matter of fact, the pledged portfolio serves as collateral not only for the overdraft but also, among others, for the monetary loans provided by the MNB and for a part of the loans disbursed under the Funding for Growth Scheme (FGS). In other words, the pledged portfolio is the full (hence, broader) set, and its subset provides actual coverage for the intraday overdraft facility. Various (eligible) securities can serve as central bank collateral, such as government securities of a suitable grade, mortgage bonds and MNB bills. As Chart 1 indicates, the MNB bill currently plays a crucial role in the composition of the security portfolio pledged by the banking sector at the aggregate level. In certain cases, the collateral pool may also include other items besides securities, such as loans disbursed under the FGS. These items, however, are disregarded for the purposes of our paper, which focuses solely on securities.

Chart 1
Pool of currently eligible collateral by security type
(January 2013 – March 2014, average values calculated based on daily data)



Securities pledged in favour of the MNB are accepted at a pre-determined discount price. For example, if a participant wishes to apply for a loan of 100 units, it will need to pledge

securities of 100 + x units in order to avoid potential risks. The difference between these two (i.e. the "x") is referred to as haircut. It is also important to note that the Hungarian collateral management practice works on a consolidated ("pool") basis, which means all eligible securities accepted by the MNB are pooled into a single portfolio and banks may take out a loan against this collateral; in other words, the pledged securities are not labelled separately based on what they have been used for. An important condition from the central bank's point of view is that the total value of collateral pool should reach the required total collateral value.

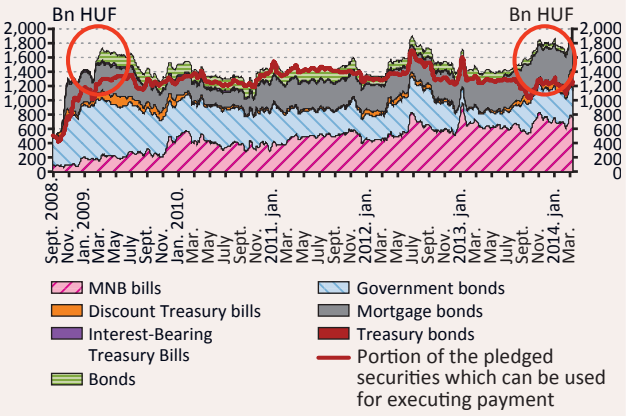
By determining the pool of eligible collateral the central bank can regulate and influence banks' liquidity. In response to the crisis of 2008, the central bank expanded the scope of eligible collateral by accepting, among others, mortgage bonds and municipal bonds, providing further support for banks' liquidity management. The pool of eligible collateral has not recently been affected by any significant changes except for the aforementioned municipal bonds, which were removed from the pool of eligible collateral at the end of February 2014 after the state took over their financing. This, however, had no significant impact, given that only two banks pledged notable amounts of such bonds. Moreover, these two members were prepared for the phasing-out of these bonds and were able to substitute them by pledging other securities.

Impact of the 2008 crisis and the Funding for Growth Scheme on the liquidity of the payment systems

Banks' failure to access sufficient liquidity for the execution of their payments may have a significant liquidity effect, including spillover to other participants. Since the entire payment system operates as a coherent network, even one participant's failure to fulfil its payment obligations might have a ripple effect through the entire market. The central bank faced this threat during the crisis in 2008. The global recession substantially transformed banks' liquidity management habits in Hungary. Confidence in interbank markets was shaken and lending practically halted, which hindered banks in obtaining the intraday liquidity required for the execution of their payment orders. In response, banks raised their pledged collateral levels and their account balances. Owing to the fact that account balances increased above the reserve requirement, banks accumulated a substantial overnight deposit portfolio during the same period.

Following the crisis, pledged security holdings, and within this the ratio of MNB bills in particular, increased substantially both at the aggregate and individual bank level. At the aggregate level, the pledged amount of collateral, which was typically at around HUF 500 billion in September 2008, tripled and rose to an average HUF 1,400–1,800 billion by the end of the period under review (Chart 2). In particular, the ratio of two-week MNB bills rose quite sharply within the pledged portfolio: by the beginning of 2014 it had shifted to 40–45 per cent from the 10–20 per cent level typically seen in 2008–2009. This is no accident as government transactions following the 2008 crisis (disbursement of IMF loan) substantially increased central bank foreign currency reserves. The public sector expenditures financed from the state's borrowings generated growth in the banks' account balances and hence in the liquidity of the banking sector. Banks then deposited this increased liquidity with the central bank in the form of MNB bills. It is apparent that systemic level liquidity and the level of the two-week bill portfolio move roughly in tandem.

Chart 2
Changes in pledged amount of collateral by security type
(January 2008 – March 2014)



Note: 10-day moving average.

As a reaction to the 2008 crisis, individual credit institutions paid far more attention to their liquidity management. Along with raising their MNB bill portfolios pledged to the central bank, they also significantly increased the intraday credit line available for them. In September 2008 the aggregate amount of intraday credit line was around HUF 500 billion. By mid-2009 this had increased to an average HUF 1,300-1,500 billion, which banks have been working to maintain ever since.

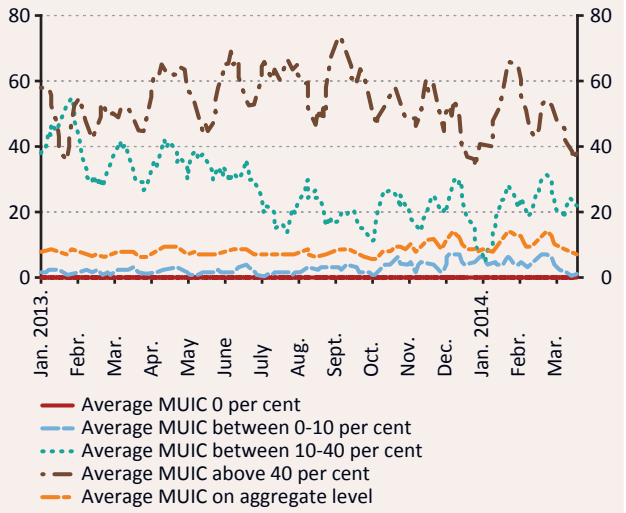
In the second half of 2013, an increasing portion of pledged securities was used as collateral for loans granted under the Funding for Growth Scheme (FGS), and hence the share of the overdraft facility available for payment purposes gradually declined within the total pledged portfolio. Trends in the intraday credit line and its collateral, the pledged securities, have been continuously changing since 2008 (Chart 2). In 2008–2009, the overdraft facility comprised 80 per cent of the pledged portfolio on average. This indicates that, besides the overdraft facility for payments, banks may have

pledged securities for other reasons as well, such as recourse to other central bank loans. In subsequent years, however, no significant difference could be observed between the total pledged portfolio and the credit line available for payment purposes, with the latter accounting for nearly 100 per cent of the pledged security portfolio. This trend lasted up until the introduction of the FGS in mid-2013. Credit institutions may take recourse to the MNB's fiscal stimulus package only against the coverage provided by eligible securities accepted by the MNB. In the second half of 2013 – since an increasing part of security holdings was used as collateral for loans granted under the FGS – the share of the overdraft facility available for payment purposes declined gradually within the total pledged portfolio. While 90–95 per cent of the pledged collateral was actually available for payment purposes in the first half of the year, by the second half of the year this rate dropped to 60–65 per cent following the introduction of the FGS. In order to maintain the earlier level of liquidity, from August 2013 onwards banks started increasing their pledged security levels, primarily by pledging discounted treasury bills and government bonds. If banks continue to actively borrow FGS loans, payments participants are expected to pledge further securities if they are to maintain the level of their liquidity. Consequently, the gap between the overdraft facility and the security portfolio is likely to open up further in the coming period.

Utilisation of credit line: aggregate versus individual level

Despite the increase observed at the beginning of 2014, the utilisation of the credit line remains low at the systemic level. Previously, we described the recent increase in total pledged securities and thus the available intraday credit line (overdraft) at the aggregate level. The absolute size of the overdraft, however, does not tell much about its "necessity" in itself. The extent to which individual credit institutions utilise the credit line is also important to understand, as this is the information that demonstrates the level of excess liquidity actually available in the banking sector. The utilisation of the credit line is measured by the maximum usage of intraday credit line indicator (MUIC), which compares the lowest intraday account balance (largest negative account balance) of a credit institution to the total available credit line.[2] On the one hand, the utilisation of the credit line depends on the size of the pledged security portfolio available for the payment transactions of the credit institution, and on the other hand, it also depends on the proportion of payment transactions executed from the account balance and from the intraday credit line. Several VIBER participants do not take recourse to the credit line for the execution of payments, or their use of the credit line is very limited. The utilisation of the credit line remains low in the banking system as a whole. Its level is only at around 14 per cent, although there was a slight increase by the end of 2013 and early 2014 compared to the prior year's similar data. One reason for the slight increase may have been the launch of the FGS as it led to a decline in the pledged amount of securities available for payment transactions, which simultaneously increased the degree of utilisation (Chart 3).

Chart 3
Time series of maximum credit line utilisation at the systemic level and for groups formed on the basis of the average MUIC values of individual banks
(January 2013 – March 2014)



Note: 10-day moving average.

There are marked differences between banks in respect of credit line utilisation. In order to gain a deeper insight into individual banks' credit line utilisation habits, we need to examine their specific features. With this in mind, we divided VIBER members into four groups based on their average MUIC values (Chart 3). The first group included credit institutions which do not use the intraday credit line at all (average MUIC: 0 per cent). Banks belonging to this group typically have a smaller share (3 per cent) in total VIBER turnover (Chart 4, left-hand chart). The second group is composed of banks that use the credit line available for them, but only to a minimal extent. The average MUIC value of this group ranges between 0 and 10 per cent. On the one hand, this group includes banks with a negligible VIBER turnover, but on the other hand, it also includes banks whose payment turnover is higher in absolute

[2] For example, if the smallest account balance of a credit institution is +2 units on a given day with a 10-unit credit line, the MUIC will be 0, i.e. the credit line was not used. By contrast, if the lowest account balance of the credit institution is –3 for the day and its credit line remains 10 units, then the MUIC will be 30 per cent. In other words, the credit institution has used 30 per cent of its available credit line on that particular day.

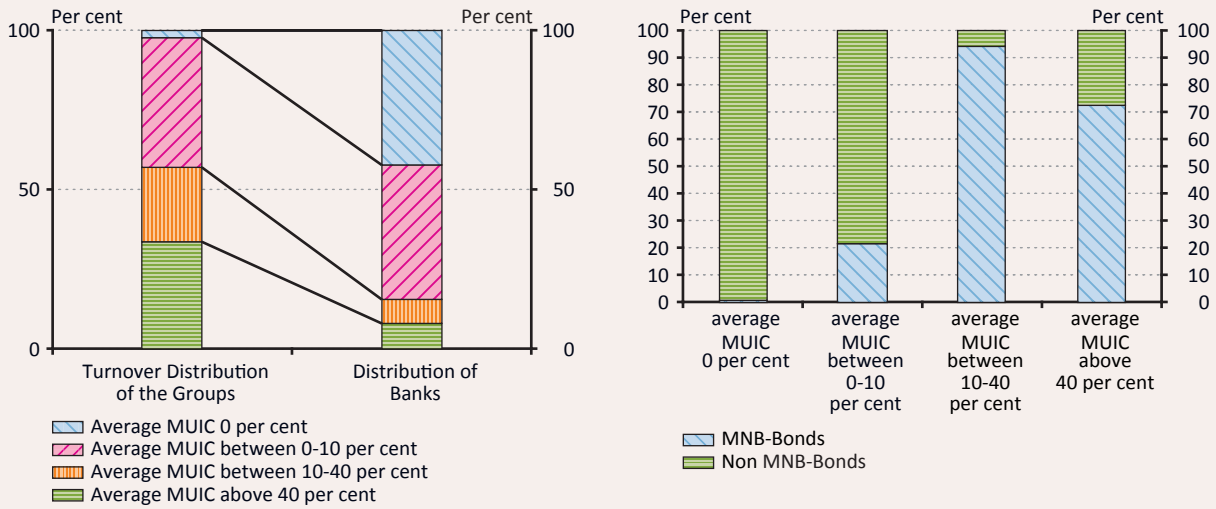
value, but the substantial account balance they keep in order to comply with the reserve requirement provides sufficient coverage for most of their transactions. Thirdly, a smaller part of the group is composed of banks whose effective credit line utilisation is lower because they have significant pledged security holdings, and since the share of MNB bills in their portfolio is only 21 per cent, they are not expected to be hit hard by the conversion of the short-term instrument into deposits (Chart 4, right-hand chart). The share of banks belonging to this group in total turnover is 41 per cent. The average credit line utilisation of banks accounting for more than one half of VIBER turnover is higher than 10 per cent. These credit institutions make up the third and fourth groups. Banks with an average MUIC value of 10–40 per cent were placed in the third group. These banks account for 23 per cent of VIBER turnover. They include large retail banks with a massive payment turnover, which they can only partially finance using their high account balances. Since this group relies on the available credit line to a greater degree, the modification of the eligible collateral pool may require a more pronounced adjustment on their part. Participants belonging to this group rely heavily on the MNB bills; therefore credit institutions belonging to this group need to prepare even more carefully for the period when the MNB bill will not be available as collateral anymore (Chart 4, right-hand chart). Banks with an average MUIC value above 40 per cent were classified into the fourth group. This group represents 33 per cent of VIBER turnover. The credit line utilisation of banks in this group often exceeds 90 per cent. This group of banks typically includes active financial market participants with a large corporate clientele. The conversion of the MNB bill into deposits is expected to require a significant adjustment on their part as well, considering that the two-week instrument comprises nearly 72 per cent of their pledged holdings. It is important to note, however, that the grouping described above considers only pledged securities and credit lines. Most banks still carry additional securities in their balance sheets to pledge; i.e. they have an option to increase their credit lines – and hence, their liquidity – further, which would reduce credit line utilisation.

EXPECTED EFFECT ON PAYMENT AND SETTLEMENT SYSTEMS OF THE CONVERSION OF MNB BILLS INTO DEPOSITS

Adjustment

The conversion of the MNB bill will affect different banks to different degrees, with the impact basically depending on the share of MNB bills in the banks' pledged and pledgeable portfolio and also on their utilisation of the credit line available. Bearing these aspects in mind, several effects may be distinguished depending on how substantial the given bank's MNB bill portfolio was. It is possible that a bank used its intraday credit only to a negligible degree on a given business day, but if it was entirely composed of MNB bills, then the bank would not have been able to execute its payments without this instrument. In order to assess the minimum credit line requirement of a specific bank for the

Chart 4
Turnover distribution of the groups formulated on the basis of average MUIC values, supplemented by the distribution of bank percentages (left-hand chart) and the ratio of the MNB bill to the total pledged portfolio in each group (right-hand chart)
(January 2013 – March 2014)



execution of its payments, we must examine what trend the payment transactions would have shown in the past one and a half years without the MNB bills in the pledged portfolio. By removing the entire MNB bill portfolio we can estimate the degree of the required adjustment. For this exercise, we need to compare the lowest account balance (the largest negative account balance) to the pledged security portfolio available for the execution of payments and to the total security portfolio that can still be pledged (pledgeable amount of collateral). If the stock of pledged securities is insufficient on an individual bank basis to provide coverage for the largest negative balance once MNB bills have been removed, the new regulation will definitely require adjustment by the bank.

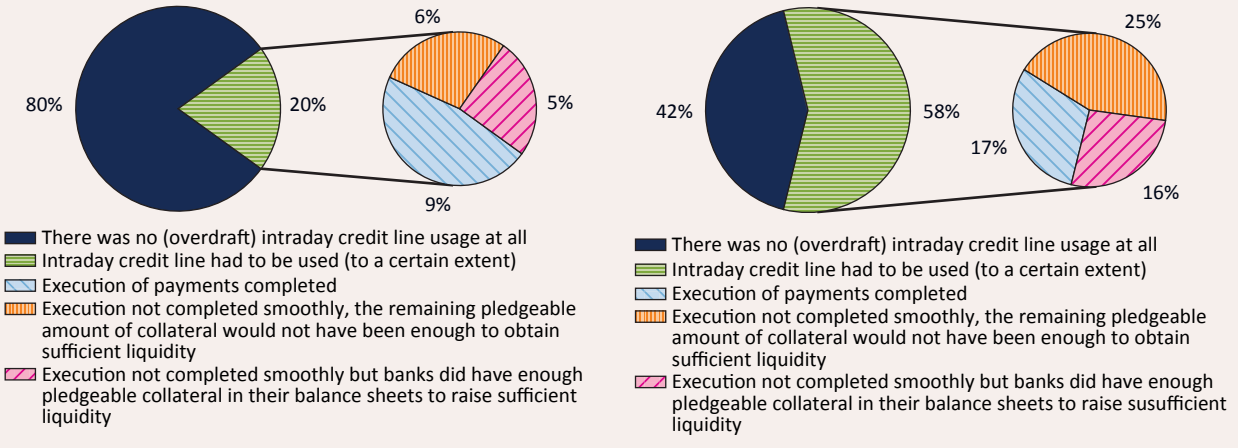
Bank-side adjustment can take place in different ways. If banks have additional securities in their balance sheets to pledge, they can further increase their liquidity by pledging them. If they do not have sufficient additionally available securities in their balance sheets to pledge then they still have several options for adjustment: they may purchase other securities, or increase their account balances and their central bank overnight deposit holdings, or they can change the timing of their outgoing payment transactions or use other liquidity management tools. In the following, we analyse these adjustment options. It is important to stress that the precise extent and method of adjustment may vary for individual banks both because of the differences between their MNB bond holdings and because of their different preferences and considerations, of which the execution of payments represents only one aspect.

Analysis methodology and results

We examined different variables for 52 banks covering the period between January 2013 and March 2014, including the lowest VIBER account balances, intraday credit line, pledged securities and securities additionally available for pledging (pledgeable amount of securities). Based on historical data and previous trends, we provided an estimate as to how liquidity management would have evolved in the area of payments without the pledged and additionally pledgeable MNB bills. We considered the effect of the conversion of MNB bills into deposits by assigning an adjusted market value of zero to these short-term instruments. Subsequently, we examined which banks on which days would have faced a problem in executing their historical payment transactions without the MNB bills. It is important to note that during our analysis the intraday – and not the end-of-day – liquidity management is examined, that is because end-of-day closed positions are irrelevant from the aspect of payments. What really matters is those ”overstretched” or ”stressful” intraday moments on a given business day when a bank has to use its liquidity quite heavily. Hence from the payments point of view, the maximum usage of intraday credit line matters the most since this indicator shows those risky situations, those ”bottlenecks” when banks needed to have sufficient amount of liquidity.

In our impact assessment we applied a simplification, i.e. we assumed that banks pledged their entire MNB bill portfolio for payment purposes. This is a simplification because, as mentioned before, the pledged portfolio may well include securities pledged for purposes other than the execution of payments, for example, providing collateral for loans disbursed under the FGS. The phasing-out of MNB bills could only be presented realistically if we adjusted each individual day and credit institution by the current FGS loan portfolio. For the sake of simplicity, we have not made this adjustment; however, we assume that the adjustment would not alter our results significantly, given that several banks actively using the MNB bills do not even participate in the Funding for Growth Scheme.

Chart 5
Distribution of adjustment reactions in response to the removal of the MNB bill from the pool of eligible collateral in respect of case number (left-hand chart) and bank number (right-hand chart)
(January 2013 – March 2014)



In the observation period, we only took into account those banks and those days when the given participant had incoming or outgoing items (14,329 cases), and then further narrowed this down to those cases where the bank had to use its overdraft (intraday credit line) against its pledged securities in order to execute its payment transactions (2,854 cases).

In 89 per cent of the cases, the phasing-out of the MNB bill – which would affect 59 per cent of the banks – would not have required any adjustment at all. In 80 per cent of the cases, there would have been no need for adjustment since in these cases, no intraday credit line was used at all. In 9 per cent of the cases, although the intraday credit line was used to a certain extent, it would have been sufficient to execute the payments even without the MNB bills. In the period reviewed, 42 per cent of the banks (22 banks) did not use the available credit line at all. A total of 17 per cent (9 banks) used the overdraft facility at least once, but they had enough coverage for executing payments even without the MNB bills (Chart 5).

In 11 per cent of the cases, the phasing-out of MNB bills would have required a certain level of adjustment since without the MNB bills, the credit line available for the banks would not have been sufficient to execute the payment transactions, which would have affected a wide range – around 41 per cent – of the credit institutions. Cases (11%) when credit institutions would not have had enough pledged collateral without the MNB bills at their disposal to cover the intraday credits represented more than 50 per cent of all the cases when intraday credit lines were used to a certain extent. This means that in the period reviewed the MNB bill played a prominent role within the pledged security portfolio in securing the available credit line. Of all the banks, 41 per cent (21 banks) would not have been able to smoothly execute their payment transactions after the hypothetical removal of MNB bills from the pledged portfolio of securities. In other words, they would have had to make some adjustment in order to execute payments.

In nearly 5 per cent of the cases in the period under review, banks would have been able to obtain sufficient liquidity by pledging additionally available securities carried in their balance sheets, which would have been a possible alternative for 16 per cent of banks to replace the two-week instrument. In 47 per cent of all those cases when the execution of financial transactions would have been somewhat problematic due to the lack of liquidity, banks still would have had enough additionally pledgeable securities in their balance sheets – even without the MNB bills. By pledging these additional securities, the related credit institutions would have been able to increase their liquidity levels and thus obtaining an adequate amount of overdraft (intraday credit line). Out of the 21 banks whose payments would have failed based on the credit line available without the MNB bills, less than one half (8 banks) would have been able to pledge further securities from their portfolios available to pledge.

Based on historical payment data, in 6 per cent of the cases, or 25 per cent of all the observed banks would not have had enough securities in their portfolios to pledge without the short-term instrument, forcing them to rely on a different adjustment method, such as the purchase of other securities or the depositing of overnight central bank deposits. In 53 per cent (798 observations) of all those cases when the execution of historical payment transactions would have failed without the MNB bills, there would not have been enough pledgeable collateral (other than MNB bills) in the banks' balance sheets to increase (overdraft) intraday credit and thus liquidity. In the period reviewed, 25 per cent of banks (13 credit institutions) had at least one day when their payments would not have been executed without disruption in the absence of the MNB bills. In other words, even the additionally available amount of pledgeable securities in the banks' balance sheets would have been insufficient to fulfil payment obligations.

It is noteworthy to mention that besides increasing the volume of pledged securities, changing the timing of financial transactions would, *ceteris paribus,* also help in executing payments. If a bank has an incoming item from another VIBER member, the financing effect of that item will have a positive impact on the bank's liquidity. In such a case, the bank's account balance is increased by the credit transactions, which may provide enough coverage to finance its outgoing items. Indeed, if a bank has to execute a high-value outgoing transaction and does not have sufficient liquidity to cover the item, it may wait until ingoing transactions increase its account balance and hence its liquidity, to execute the transaction at a later point in time. This attitude is manifested in banks' item timing behaviour. Altering timing behaviours, however, is an assumption that is difficult to model and generalise, and therefore we did not take this into consideration in our current analysis. Nevertheless, it can be clearly seen that upon the introduction of intraday clearing in ICS (GIRO), banks adjusted to the new situation by significantly altering the timing of their transactions (postponing them to a later part of the day), thereby securing sufficient coverage for their ICS transactions.

Another possible alternative is to raise the required reserve ratio, which would have provided sufficient room for manoeuvre for 9 banks of the 13 banks that would not have been able to pledge additional securities based on their balance sheets. One possible scenario is that banks may attempt to maintain their former liquidity levels in the future by raising their account balances above the reserve

requirement rather than sustaining the amount of pledged securities. The 9 banks would have been able to raise the required reserve ratio because they did not use the maximum 5 per cent value. Indeed, most of them only maintained the minimum 2 per cent level, so they clearly have room for an increase. Banks, however, may wish to manage the situation by excess liquidity higher than what is ensured by their required reserve ratio, which might increase their overnight central bank deposits. By doing so, they would practically rearrange the current proportions of their liquidity: the share of overnight facility would be reduced whereas in turn, the share of account balance would be increased.

Besides the adjustment options discussed so far, banks can improve their liquidity positions in several other ways. They could also accommodate by obtaining liquidity from the foreign exchange market or from the interbank deposit market; i.e. they may borrow funds from banks that have excess liquidity at the moment. If a bank does not manage the shortage of coverage at all and allows its items to be placed in a queue, this could also be considered as a way of adjustment. Based on the experiences of recent years, however, this latter is a less likely scenario though, as banks continue to pay special attention to the execution of payment transactions.

Individual preferences and circumstances will determine the adjustment options that banks choose. Banks will select from the above listed liquidity-providing methods depending on what the prior best practices were, what options the bank in question currently has and how it assesses all these possible options/scenarios.

Security purchases and other effects

The conversion of the MNB bill into deposits affects 25 per cent of banks, and the extent of the adjustment largely depends on the level of liquidity which individual VIBER members are prepared to maintain. If we assume that banks wish to maintain the pledged security portfolio and the size of the credit line secured by it for payment purposes, this impact will be obviously more pronounced, affecting more cases and more banks. After the introduction of the FGS, when banks' liquidity and credit line available for payments decreased, banks responded by pledging additional securities in order to ensure the same level of the liquidity that they have maintained since the 2008 crisis. Based on this and assuming that they will continue to pursue their previous practice, banks are expected to maintain the current convenient level of intraday liquidity and find a way to replace the MNB bills with something else. This will most likely take the form of additional security purchases or stepping up their central bank overnight deposit portfolios.

Based on historical payments data, the banking sector's adjustment in response to the conversion of the MNB bill would have to amount to HUF 500 billion in order to ensure that payments are executed, with the backing of the previous level of sufficient, ample intraday liquidity, *ceteris paribus*. This HUF 500 billion means that there was a day during the period under review when, in the absence of the MNB bills, at least this amount of credit line would have been needed, *ceteris paribus*, for the smooth execution of historical payment transactions. Out of this HUF 500 billion, on this particular day banks would have been able to obtain HUF 219 billion from the portfolio carried in their balance sheets available to pledge. The remaining HUF 281 billion, however, would have had to come from some other sources. Having said that, this HUF 500 billion is an extreme value as there was only one such case during the 15-month period reviewed. Looking at the entire period from the perspective of payments, *ceteris paribus*, MNB bills would have been missing in the amount of HUF 121 billion in the system on average, of which banks would have been unable to provide replacement securities worth HUF 85 billion based on their pledgeable amount of securities. This average adjustment pressure of HUF 85 billion demonstrates that the banking sector would have needed this amount of additional liquidity to successfully manage its historical payment turnover. This value, however, indicates only the average additional liquidity needs. If banks wish to further maintain the high levels of pledged securities – which they have done consistently since 2008 – the banking sector as a whole will have to replace MNB bills worth HUF 670 billion on average in order to achieve the previous payment turnover with the same conditions.

Other effects expected in future – such as the expansion of the FGS – may modify our results significantly. The Funding for Growth Scheme is being expanded continuously, which implies steadily increasing collateral needs for the loans provided under the scheme. This reduces the credit line available for payments even further. Increasing FGS disbursements will only exacerbate the adjustment pressure arising from the conversion of the MNB bill into deposits. However the exact effect of this cannot be calculated as yet, as it depends on various factors, such as the size of the loans disbursed, the type of the selected collateral, and other adjustment methods.

SUMMARY

Our paper analyses the effect of the removal of the MNB bill from the pool of eligible collateral and the possible adjustment reactions. In order to fulfil its payment obligations, a credit institution must have a sufficient level of liquidity (account balance and credit line) at its disposal. Coverage for the credit line is secured by the security portfolio pledged to the

central bank. It was seen that, at an aggregate level, the MNB bill accounts for a substantial part of the pledged security portfolio, and it has become a crucial instrument in recent years in respect of liquidity management. Individual bank characteristics show significant differences in terms of the fulfilment of payment obligations: some banks are capable of financing outgoing items using solely their account balances, while others also rely on their intraday credit lines.

In order to obtain a precise view on the impact of the MNB bill's removal, we identified the number of cases when the execution of payment transactions would have taken place smoothly without the MNB bills and also the number of cases when execution would have failed – based on historical data. Of all the banks observed, 16 per cent (8 banks) would have failed to fulfil their financial transactions, although by pledging other securities carried in their balance sheets they would have been able to obtain additional funds to increase their liquidity, which would have been sufficient to finance their outgoing items. This, however, was not an option for 25 per cent of banks (13 banks), which would have been forced to seek some other forms of adjustment. Owing to the phasing-out of the MNB bill, the banking sector would need an adjustment of HUF 500 billion overall, to ensure the execution of payment transactions on an individual bank basis.

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Orsolya Csortos, Kristóf Lehmann, Zoltán Szalai: Theoretical considerations and practical experiences of forward guidance[1]

The communication of monetary policy has changed substantially in recent decades as central bank transparency has become ever more widespread. This increase in central bank transparency arose from the need for the accountability of the newly independent institutions and also from the recognition that, in addition to policy instrument changes, monetary policy can also influence economic developments by shaping expectations. In the financial crisis of recent years, several central banks' base rates have approached the zero lower bound, which intensified the importance of forward-looking communication, as the shaping of expectations has remained the only instrument for conventional monetary policy to use in its effort to implement the additional easing necessitated by the state of the economy. Another approach, less widespread in the international literature as of yet, holds that the expected real interest rate cannot be lowered and current expenditure thus stimulated by raising inflation expectations; forward guidance can, however, keep long-term nominal yields low and prevent real interest rates from rising and bond markets from reacting excessively through normalisation. We take a look at the practice of, and experiences from, forward guidance during the crisis through the example of the Federal Reserve (Fed) and the European Central Bank (ECB). Based on our findings, although the strategic importance of this type of communication instrument may wane after the crisis, there has been an undeniable shift towards communicating monetary policy assessments of, and responses to, the prevailing conditions, and thus towards a greater transparency in the operation of central banks.

THE SIGNIFICANCE OF CENTRAL BANK FORWARD GUIDANCE

'*Saying what you do and doing what you say*' is the basic principle of credible and transparent central bank operations.[2] This is necessary because a transparent central bank can shape expectations more effectively (for instance by anchoring inflation close to the target), thereby improving the efficiency of monetary policy by buffering the real economic costs of inflation shocks. Managing expectations is an important transmission channel, since consumption and capital investment decisions tend to depend on longer-term (real) interest rates, which are impacted by the current level of base rates only to a limited extent. Expectations for the base rate path and the medium-term inflation outlook play a dominant role in determining yields over the longer term. Shaping short-term interest rate expectations also influences long-term rates, which in turn has an effect on the real economy in the present. Accordingly, a more proactive management of expectations can increase the efficiency of monetary policy measures without hitting the zero lower bound (ZLB), as more distant points in the yield curve may shift in the way desired by the central bank. If the central bank is able to shape these, then – provided that the economic agents are forward-looking at least in part – it will be able to exert influence on the current real economic and inflationary processes as well.

Accordingly, transparent central bank operation and clear communication became increasingly widespread even before the onset of the crisis, with the role of forward guidance subsequently gaining even greater significance once the zero lower bound was reached. Consequently, it has become a widespread practice for central banks to publish the details of their monetary policy strategies, their target variables, their decisions and the main arguments for the same, along with their view of the expected future development of the economy. In normal times, this allows economic agents to deduce from the previous decisions and the systematic behaviour of the central bank how it would respond to various economic processes and shocks. However, if uncertainties surrounding economic prospects increase, the role of communication on the future conduct of monetary policy grows more important as economic agents face unfamiliar situations on the one hand and the zero lower bound restricts leeway for monetary policy

[1] We wish to thank several of our colleagues for their suggestions and especially Zalán Kocsis for his useful comments.
[2] "Saying What You Do and Doing What You Say" (Friedman–Laxton, 2009).

on the other hand, rendering it increasingly difficult for central banks to shape expectations for monetary conditions.

THEORETICAL CONSIDERATIONS UNDERLYING FORWARD GUIDANCE

In advanced economies, central banks are **generally characterised by transparency in their operations**, offering market participants a clearer picture of what behaviour they can expect from monetary policy-makers. If a central bank is focused on price stability, market participants' interest rate expectations will be determined by what central bank base rate path they believe will ensure that the inflation target can be achieved at the declared monetary policy horizon. It may serve as a significant factor in shaping these expectations if a central bank publishes its forecasts and makes the considerations supporting its monetary policy decisions publicly available. Although the transparency of operations makes central bank behaviour more predictable, this does not always guarantee that the expectations of market participants will be aligned with the intentions of the central bank. Beyond the credibility of the central bank, this also presupposes that market participants think similarly to the central bank when it comes to the macroeconomic factors and outlook determining monetary policy and the appropriate responses to the same by central bank decision-makers. If there is no such similarity in thinking, then the central bank may harmonise the expectations of market participants and central bank's intentions by giving explicit signals of the expected future path of the base rate.

The most common form of forward guidance adopted by the best practice inflation-targeting central banks is **forecast-based forward guidance.** Forecast-based forward guidance gives a signal of the most probable monetary policy response at the given information base. Thus, in an ideal case, even the more remote points on the yield curve will move as intended by the central bank.

Forecast-based forward guidance may take the form of mere verbal signalling of the expected future path of interest rates (e.g. the direction of future steps or the expected steepness of the interest rate path), but it may also incorporate the publication of an interest rate path consistent with the central bank's macroeconomic forecast (the latter is feasible if the forecast is prepared assuming an endogenous monetary policy response[3]). The central banks that publish the entire interest rate path (e.g. Sweden, Norway and New Zealand) consider it important to emphasise that the interest rate path published is merely a forecast based on the currently available information base and therefore it should not be considered a promise or any kind of commitment. By doing so, they create the possibility of deviating from the originally forecasted interest rate path without a loss of credibility in the event of unexpected future shocks. Some special cases, however, warrant some level of commitment in forward guidance on future action.

Such cases include scenarios where economic conditions and the previously applied reaction function would warrant further monetary easing, but the policy interest rate has already reached the zero lower bound and cannot therefore be lowered any further. In such circumstances, low inflation (or deflation) may be coupled with an excessively high real interest rate, leading to a further fall in aggregate demand and a further widening of the negative output gap. The central bank may alleviate this by providing **commitment-based forward guidance**, i.e. for instance by announcing that it will keep the policy rate low even at the expense of tolerating a temporary deviation from the inflation target, thus generating inflation expectations and reducing the real interest rate. Lower real interest rates boost the economy by bringing consumption spending forward and stimulating investments.

The key difference between forecast-based and commitment-based forward guidance is that the former involves the central bank disclosing information about the expected outcomes of its customary strategy, whereas the latter aims to achieve its effects via the temporary suspension of the usual strategy. Commitment-based forward guidance typically stipulates some kind of condition, as no central bank wishes to commit over the long term to a strategy it would not consider optimal under normal circumstances. Central banks employing commitment-based forward guidance generally formulate time-contingent conditions (time-contingent commitment) or conditions predicated on the state of the economy (state-contingent commitment); in either case, the forward guidance may be open-ended or specified. It is important to note here that a time-contingent condition makes it ambiguous whether the central bank's forward guidance is forecast-based or commitment-based, since signalling that a certain interest rate level will remain in place until a given date does not reveal if this means that the central bank is acting in accordance with its customary strategy or if it seeks to increase its effectiveness through a temporary deviation from the same.[4] It is also important to

[3] This means that the path of interest rates and exchange rates is determined endogenously so that inflation develops in line with the inflation target on the horizon considered relevant by monetary policy.

[4] The signals of a central bank will have different consequences depending on which category economic agents assign them to. Signalling a base rate remaining near the zero lower bound for an extended period may send the message that the central bank expects protracted economic weakness, but may also suggest that the interest rate level will remain low even after the recovery has started. The former message may dampen economic activity whereas the latter may stimulate it.

note that a central bank deviating from its usual strategy faces a dilemma: first, the effectiveness of its measures depends on whether market participants will believe its commitment to temporarily departing from its strategy given the exceptional circumstances and, second, if a central bank deviates from its previously announced strategy excessively or for too long, this can easily lead to a weakening of the long-term anchoring of inflation expectations.

Central banks face **numerous other challenges** when implementing forward guidance in practice. Even if a central bank is able to convince economic agents that its forward guidance is commitment based, definition of the time horizon will not make it clear which variables should change as a precondition for suspending the central bank's guidance. Commitment in such cases raises the issue of time inconsistency, when the central bank promises behaviour that is optimal in the present day but may easily feel tempted to deviate from the proclaimed strategy as time passes and the economic circumstances change. This problem is in part remedied by state-contingent guidance, in which the central bank predicates maintaining the commitment on changes in certain macroeconomic variables. However, selecting suitable indicators for the state-contingent guidance may still present a problem, along with the definition of their long-term equilibrium levels. And if the set of conditions are overly complex, the clarity and therefore the efficiency of the guidance may weaken. In addition, the diverging opinions of, and communication by, central bank decision-makers regarding the development of economic processes may also diminish transparency and credibility, and therefore the efficiency, of the guidance. Finally, it should be remembered that the use of forward guidance may indirectly cause stability risks.

THE RELATION BETWEEN FORWARD GUIDANCE AND BOND MARKET REACTIONS

Most analysts and economic policy-makers have welcomed forward guidance as a new communication instrument of central banks in the crisis. The interpretations discussed above hold that the main objective for a central bank that has approached the zero nominal lower interest rate bound is to reduce the expected real interest rates by *raising inflation expectations to near the target* and thus stimulate the economy through the expectations channel. Another approach holds that *the expected real interest rate cannot be lowered and current expenditure thus stimulated by raising inflation expectations*; forward guidance can, however, keep rises in long-term nominal yields under control and prevent real interest rates from suddenly rising and bond markets from reacting excessively through normalisation. This approach highlights the role of forward guidance in mitigating bond market uncertainties linked to the beginning of the tightening cycle and in preventing the panic-driven selling of bonds. The current problem facing central banks is highlighted by the global bond market crisis triggered in 1994 by the Federal Reserve's tightening cycle,[5] when interest rates were held level for five years and then in February 1994 the Fed raised the policy rate by 25 basis points to 3.25 per cent. There was a frantic response on bond markets, including in countries whose central banks had not raised the interest rate, which surprised market analysts and the Fed alike.[6]

Having learnt from the trauma of the 1994 bond market crisis, the Fed reassured bondholders right at the start of a similar rate hike cycle in 2004–2006 that it would implement the hike in small incremental steps and take care to minimise the losses of holders of bond portfolios financed by credit. The Taylor rule comprising purely macroeconomic indices (GDP and inflation) would have suggested a faster hike of interest rates, but bond market considerations and the need to keep long-term yields stable made the Fed's decision-makers cautious. Accordingly, forward guidance was used, with the FOMC[7] declaring that monetary policy accommodation might be maintained "*for a considerable period*". The Fed's transparent and credible communication successfully calmed deflationary risks and alleviated bond market tensions; nevertheless, the persistence of easy monetary policy may have contributed to the build-up of imbalances ultimately leading to the onset of the 2008 financial crisis.

In the current situation, the Fed and similar leading central banks want to avoid bond market crises similar to those in the past, triggered by an insufficiently prepared tightening cycle. Several factors today indicate that potential bond market losses could exceed those of the 1994 crisis:

- The stock of bonds at present is many times greater than the stock in 1994.
- The stock is more sensitive to interest rates as the current stocks were accumulated at interest rate levels that were

[5] See Turner (2013) for a detailed description.

[6] According to the BIS report for the year, the fundamentals and the inflationary pressure did not substantiate such a rise in yields at all. The Fed finally managed to control the inflation expectations and yields started to fall in 1995. However, stabilising the yields took much longer than expected. According to estimates at the time, the rate hike cycle caused a loss of USD 1.5 trillion (thousand billion) on the global bond markets, equal to almost 10 per cent of OECD GDP at the time.

[7] Federal Open Market Committee, the chief decision-making body at the Federal Reserve.

low for extended periods. In its 2013 annual report,[8] the BIS estimated that holders of US Treasury securities (excluding the quantity held by the Federal Reserve) would lose more than USD 1 trillion if yields were to rise by 300 basis points across the maturity spectrum of the yield curve. This amounts to 8 per cent of US GDP. A similar calculation reveals that holders of French, Italian, Japanese and UK government securities would face losses equal to 15 to 35 per cent of their GDP (Chart 1).

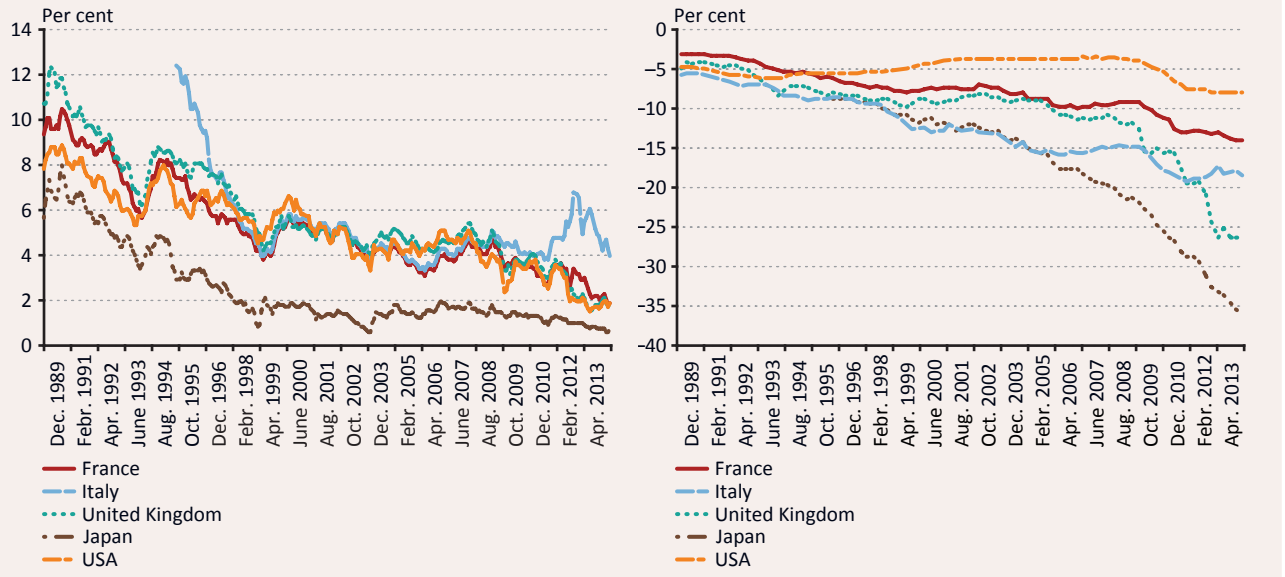
- The available information suggests that ownership is fairly concentrated, clustering primarily in the financial sector. Furthermore, in the US alone the stocks of bonds other than central bank bills that market participants hold are many times greater today than the stocks during the 1994 crisis.
- Growth was sufficiently robust at the time of the 1994 bond market crisis to help the economy out of the impasse; today, however, it is questionable whether growth is resilient enough.

Taken together, these factors mean that investors could potentially react far more sensitively to even a smaller interest rate hike. Box 1 contains a numerical example to illustrate the sensitivity of bonds to interest rates.

The risks could be aggravated if other shocks due to an absence of substantive recovery in the economy (e.g. supply-side shock, rising inflation expectations) nevertheless forced a rate hike. Forward guidance seeks to mitigate the probability and spread over time the occurrence of the prevailing larger risks, making it easier for economic agents to tolerate them. If a rate hike cycle is timed well and starts only when the recovery is sufficiently robust, the participants exposed to the risk will be able to offset their losses in other lines of business (e.g. shares, loans, etc.). If, moreover, forward guidance successfully delays the adjustment, market participants will have further leeway to absorb their losses without causing a major macroeconomic shock.

In view of all of the above, decision-makers face a dilemma concerning the period of normalisation after the current highly accommodating monetary policy. In the recent long period of low yields, investors have increased the ratio of longer-term and higher-yield bonds which are however exposed to interest rate risk, and generated demand for such new issues. Most of them have borrowed considerable sums at low interest rates to assume the positions, which is another strong transmission channel between changes in short-term interest rates and long-term yields. For instance, when, at the start of a rate hike cycle, they expect short-term interest rates to rise, they will sell their longer-term securities to minimise their capital losses on bonds. In extreme cases of mass sell-offs, this may lead to default by institutional

Chart 1
Bond yields and interest rate risk
10-year government bond yields* Changes in government securities portfolio values following yield increases, as a percentage of GDP**



** Monthly average.*
*** For each country, the estimated change in the value of government securities as a percentage of GDP following a hypothetical rise by 300 basis points.*
Source: BIS calculations.

[8] BIS (2013), p. 8.

Box 1

The interest rate sensitivity of bonds

Modified duration (MD) is used to express the change in the market price of bonds and other fixed-interest securities in response to a change in market interest rates. The market price of a bond is in fact the discounted present value of the cash flows generated from it. This present value changes each time market interest rates change, which is used in the discounting. The size of the change, however, will not affect every bond in the same way: the same change in market interest rates will have a larger impact on longer-term bonds and on bonds that pay lower interest.

Take for instance the US Treasury bond ISIN US912828B667, maturing on 15 February 2024 and having a nominal value of USD 100,000,000, which pays 2.75 per cent coupon twice a year and has a modified duration (MD) of 8.4. This means that if market interest rates were to increase from the 2.48 per cent prevailing on 20 May 2014 to 3.48 per cent, the bond price would fall by 8.4 per cent. In Table 1, we present the impact of bond features on sensitivity to interest rates by altering the parameters of a bond similar to the above. In normal times, interest rates rise less on the longer than on the shorter maturities of the yield curve in an interest hike cycle, which mitigates the loss in value of the bond portfolio; the example of 1994 illustrates, however, that a parallel shift of the yield curve, representing all the maturities, is not impossible under certain circumstances.

Table 1
The sensitivity of a hypothetical bond to interest rates

Bond	Maturity (years outstanding)	Coupon (twice a year)	Modified duration (MD)*	The market value of a bond of USD 100 market value if the interest rate rises by 100 basis points
1.	10	2.75	-8.7	91.3
2.	10	5.0	-8.1	91.9
3.	10	10.0	-7.3	92.7
4.	20	2.75	-15.4	84.6
5.	30	2.75	-18.4	81.6

**Modified duration expresses the percentage change in bond price in the event of a 1-percent (100-bp) rise in interest rate triggering an equivalent parallel shift of the yield curve.*

The modified duration formula: $MD = -\frac{D}{1+\frac{r}{f}}$; where *D* is the duration, *r* is the market yield and *f* is the number of interest payments per year. The duration in the formula, known as Maculay duration, is the discounted present value of the bond's cash flows (interests and final principal repayment), weighted by the times at which individual cash flows are due. The formula: $D = \sum_{i}^{n} t_i \cdot \frac{PV_i}{V}$, where *n* is the total number of cash flows, *i* is the sequence number of individual cash flows, *t* is the number of years outstanding until individual cash flows, *PV* is the present value of the individual cash flows and *V* is the sum of the present values of cash flows (which is the market price). We use *r*, the market yield, as the discount rate to calculate the present value. The present value of a coupon for amount *c*, payable in one year is $PV = \frac{c}{1+r'}$ if the annual interest is *r;* the present value of the coupon due in two years is $PV = \frac{c}{(1+r)^2}$, if the market interest rate remains *r* in the second year as well, etc.

Note: For the sake of simplicity, we disregarded the fact that duration provides only an approximate estimate as it offers only a linear approximation of the non-linear correlation between market interest rate and bond price. In practice, convexity will modify the exact value of sensitivity, but for illustration purposes this difference is negligible.

capital market participants, intensifying the tensions on the bond market and ultimately leading to a potential halting of macroeconomic recovery.[9]

Under this approach, the role and the mechanism of forward guidance differs from what is presented in the section above: expected real interest rates cannot be decreased by

[9] This approach has failed to gain wider currency so far because the models used to date have disregarded the possibility of default by bond market participants (and have often failed to incorporate even financial variables or a financial intermediary system). Recently, however, Feroli et al. have designed a model in which a bond market participant may default, similarly to a commercial bank, even if it had not relied on credit to finance its portfolio.

elevating inflation expectations to central bank's target, as rising inflation expectations would dampen the expected real yields of existing bonds and push the long-term yields of newly issued ones upward on bond markets, which could trigger a wave of sell-offs of existing bonds.[10] Especially in the economies based on capital markets such as the United States or the United Kingdom, a rise in yields would make recovery very difficult due to the rise in borrowing costs for corporations and could, in an extreme scenario, even prevent a recovery.[11] This view thus posits that the goal of Federal Reserve and Bank of England decision-makers with forward guidance is not to raise inflation expectations and thus reduce real yields, but rather to curb the rise in long-term nominal yields and thus prevent excessive bond market reactions in the course of the normalisation of interest rates.

FORWARD GUIDANCE PRESENTED THROUGH THE PRACTICE OF THE FEDERAL RESERVE

Similarly to the best practice inflation targeting central banks (e.g. the central banks of Sweden and New Zealand), the globally dominant Federal Reserve had already been making efforts to achieve transparent operations and credible communications a number years before the financial crisis. Accordingly, it has published statements following its decisions since 1994. In addition, three weeks after each meeting, it publishes the minutes of the meeting, which record the FOMC's decisions and present in detail the underlying considerations. Since 2007, FOMC members have provided quarterly projections of the key economic indicators. These are instruments of communication forming part of the **general clarity and transparency of the central bank**.

Forward-looking communication by central banks took on even greater importance following the onset of the global financial crisis.[12] In the case of the Federal Reserve, this is attributable to the fact that it had reduced the base rate to the 0–0.25 per cent band in December 2008, and, having thus reached the effective lower bound, it did not have the opportunity to carry out further cuts. At this point, it tried to implement further monetary easing by implementing unconventional tools, **reinforce forward guidance and** make a shift towards **commitment-based forward guidance**.

From then on, the FOMC used **time-contingent forward guidance**; accordingly, it first communicated that the interest rate band near zero would be maintained '*for some time*'. Then, from March 2009 onwards, it projected this exceptionally low interest rate "*for an extended period*". In August 2011, it **specified the former open-ended time-contingent forward guidance**, replacing the expression "*for an extended period*" in its statement and declaring that it would maintain the interest rate at this level "*at least through mid-2013*". Subsequently, in January 2012 it extended its commitment to near-zero interest rates "*at least through late 2014*" and then in September 2012 "*at least through mid-2015*". In the meantime, the Fed also decided in January 2012 that it would publish the conditional interest rate projections of the decision-makers in order to efficiently manage expectations.

In December 2012, the time-contingent forward guidance was replaced with (an also specified) **state-contingent forward guidance**, which stipulated that an interest rate level near 0 would be maintained, subject to reaching certain explicit macroeconomic thresholds. According to the forward guidance, this exceptionally accommodative monetary policy would be maintained at least as long as the unemployment rate remained above 6.5 per cent, inflation did not exceed 2.5 per cent and long-term inflation expectations continued to be well-anchored (Evans rule). The 6.5 per cent threshold would not, however, inevitably trigger an interest rate rise: if allowed by the inflation expectations or outlook, the accommodative monetary policy may be maintained further. While the guidance contingent on the unemployment threshold is in line with the Fed's dual mandate, the quantified inflation condition suggests a willingness on the part of the Federal Reserve to deviate from its previously customary strategy of targeting 2 per cent inflation.[13] At the same time, specifying the anchoring of inflation expectations as a condition communicates the

[10] This argument was elaborated by Jan A. Kregel against Krugman's view, who had similarly recommended that the Bank of Japan should raise inflation expectations to escape the liquidity trap (Kregel, 2000). Currently a number of economists (Stein, 2013; Feroli et al., 2014) are working on building models that contain fewer simplifying assumptions than the earlier macroeconomic models and are able to explain the seemingly excessive response of the bond markets to even minor increases in interest rates. In these models, bond market prices are highly influenced by the expectations regarding future growth: news impacting these expectations triggers the repricing of all the bonds already on the market, and new issues are then adjusted to the prices of the large stock of bonds already on the market.

[11] There are two types of risks related to this (Bernanke, 2013): if central banks keep base rates low for too long, then additional financial risks may build up, as yield-hungry investors buy even more long-term bonds exposed to interest rate risks (based on research by Jeremy C. Stein). The other risk concerns the start of yields rising, as an early increase in yields prevents recovery. The latter may be avoided by employing, among other things, the instrument of forward guidance.

[12] The Fed had used the instrument of forward guidance before the 2008 financial crisis, specifically when it started the rate hike cycle in 2004; see the preceding section.

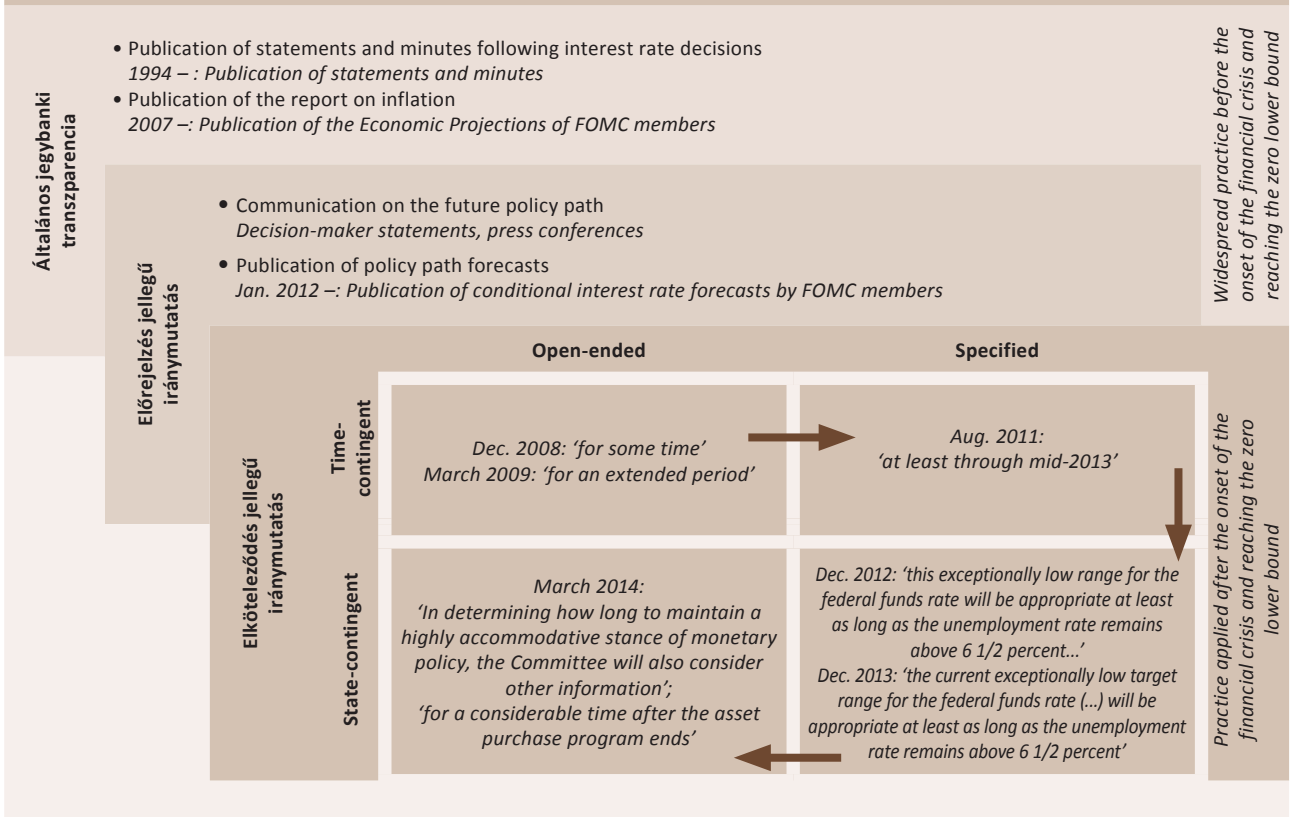
[13] In January 2012, the Board of Governors of the Federal Reserve announced an explicit inflation target of 2 per cent. The statement released at the time confirmed that the Fed continued to consider fulfilling its dual mandate, i.e. achieving price stability and full employment, as its main goals.

message that the deviation must not be more than temporary. One year later, in December 2013, with the unemployment threshold stated in the forward guidance approaching, Federal Reserve chairman Ben Bernanke declared that the current Fed interest rate target of near zero (0–0.25 per cent) will probably remain in effect *well* after the unemployment rate falls below 6.5 per cent, especially if the expected inflation rate remains below 2 per cent on the longer term. This did not represent a substantial change in the future monetary policy stance.

Under the chairmanship of Janet Yellen, appointed to this post as of 1 February 2014, the Fed changed its forward guidance again in March, although it emphasised that this did not reflect a change in the FOMC's assessment of the situation. The forward guidance was modified: the policy rate would remain at the current low level even after the asset purchases[14] have been phased out. The Federal Reserve will decide potential future interest rises on the basis of the changes in a number of determinants and will take into account, above and beyond the labour market conditions, inflationary pressures and inflation expectations, as well as the financial processes: its **state-contingent commitment has thus become open-ended**.

We have seen therefore that the Fed used several different types of forward guidance, which also highlights the practical challenges inherent in providing guidance. During its use of time-contingent forward guidance, the Fed was criticised repeatedly on the grounds that the frequent modifications of the guidance reveal the deterioration in FOMC members' assessment of the economic situation, which may in turn motivate economic agents to increase their savings rather than bring their spending forward, as they see the continued challenges. The use of state-contingent commitment was intended as a remedy to this problem, but it also provided guidance concerning only a specific value of a selected variable. Firstly, selecting the right indicator (GDP growth, unemployment rate, different labour market indicators) proved to be a challenge and, secondly, even after selecting the indicator, the Fed faced the problem that the selected variable did not adequately reflect capacity utilisation in the economy. Many, including Fed decision-makers, pointed out that the changes in the unemployment rate underestimated the unutilised capacities in the economy, because its fall was attributable largely to the decline in the activity rate, even as new job creation and other employment indicators continued to remain below levels considered to be favourable. And

Chart 2
Various forms of central bank communication and forward guidance presented through the Fed's practice



[14] In December 2013, the Fed started reducing the monthly amount of its asset purchases. It cut the monthly budget for this programme from USD 85 billion to USD 45 billion in the period between December 2013 and May 2014.

finally, state-contingent forward guidance also fails to declare how the policy rate will change once the thresholds are reached; communicating this has been one of the greatest recent challenges for the Fed.

FORWARD GUIDANCE USED BY THE EUROPEAN CENTRAL BANK

The Governing Council of the European Central Bank has published forward guidance since July 2013 regarding the future path of policy rates based on the inflation outlook. The introduction of forward guidance to the ECB's communication represents a substantial change, as it is no longer concerned solely with the economic outlook and risks but also signals the future direction of economic policy on basis of such. The trigger for this announcement was the significant increase in financial market volatility from late May in the wake of the Fed's communication of tapering, as a result of which the slope and the long end of the yield curve increased considerably. This increased financial market volatility signalled that future expectations for ECB policy rates have become overly sensitive to shocks not dependent on European economic conditions but financial market developments and the associated uncertainties. All of this pointed towards a tightening of monetary policy in spite of the ECB's cut in the policy rate in May 2013.

To respond to these trends by increasing the effectiveness of its monetary policy, the ECB first provided forward guidance in July 2013, stating that the key policy rate would '*remain at present or lower levels for an extended period of time*'. In November 2013, the guidance was maintained and the policy rate reduced; in January and February 2014, the earlier guidance was confirmed. After its March meeting, the ECB highlighted certain variables that might play a role in determining the future direction of monetary policy (e.g. unutilised capacities). Accordingly, applying the earlier categorisation we find that the ECB guidance was first open-ended time-contingent and subsequently open-ended state-contingent.

The ECB's forward guidance has a number of objectives. First, after reaching the zero nominal lower bound it sought to ease monetary conditions by committing to keeping the policy rate permanently low. The ECB committed itself to keeping the policy rate low for longer than could have been expected from its past behaviour (response function). In doing so, it wanted to reduce long-term interest rates via the expectations channel. In addition, the policy rate forward guidance may help reduce financial market volatility and thus increase the efficiency of monetary policy.

The ECB's forward guidance, however, was subject to numerous criticisms, which may have contributed to the limited effectiveness of this tool. By giving open-ended time-contingent guidance the ECB had given itself sufficient flexibility to deviate from its announced strategy, but it disclosed too little information regarding the extent of its commitment, which may have significantly weakened the efficiency of this communication tool and limited its ability to deliver the intended impact. It encountered similar obstacles with the guidance it employed subsequently: even though it was (open-ended) state-contingent, this guidance did not offer additional information on the change in the monetary policy reaction function, i.e. the variables analysed, the threshold values and the determinants triggering future changes in the direction of monetary policy.

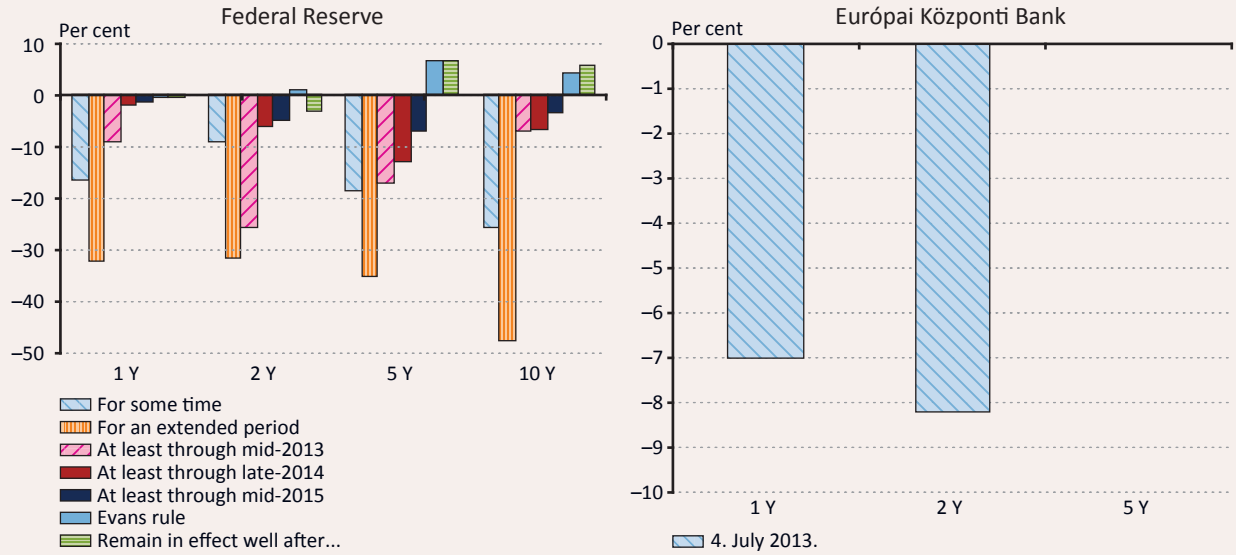
EXPERIENCES FROM FORWARD GUIDANCE

One key subject in the March 2014 BIS Quarterly Review (Filardo–Hofman, 2014) was the analysis of the efficiency of forward guidance as used in the recent period by the ECB, the Bank of England, the Bank of Japan and the Federal Reserve. Forward guidance of the key policy rate path can influence financial markets and economic processes through three channels.

In the first channel, theoretical considerations suggest that forward guidance may influence the future expected short-term interest rates as well as long-term bond yields. The results showed that while guidance did in fact have some impact on the expectations of the future path of short-term interest rates and long-term bond yields (interest path expectation component), the impact varied for each central bank over time and depending on the guidance method employed (Chart 3). In the case of the United States, for instance, short-term and long-term expected yields tended to decline on most announcement days. The Fed's announcements of qualitative[15] forward guidance triggered the most intense reactions; it is important to note, however, that these reactions may have also reflected the announcements of actual policy rate cuts as well as asset purchases. The market effects of commitment-based, time-contingent forward guidance decreased over time. Announcements of state-contingent guidance had no measurable impact; on the contrary, their impact on longer yields was undeniably

[15] According to the categorisation in the study, forward guidance is qualitative if it does not provide detailed quantitative information about the future path or the time horizon of the policy rate (e.g. 'the base rate will remain at its current level for an extended period'). In our categorisation, this classifies as open-ended guidance.

Chart 3
The impact of forward guidance announcements on three-month interbank and government bond yields



Note: The values presented are calculated as the end-of-day value on the announcement date minus the end-of-day value on the day before the announcement. For the Federal Reserve, the three-month eurodollar yields and the 10-year nominal bond yields, for the ECB, the three-month Euribor futures yields are plotted.
Source: Bloomberg, BIS calculations.

unfavourable. Underlying this may be the fact that the Fed's state-contingent commitments meant a change in the central bank reaction function, which may have an unfavourable impact on predictability over the longer term or jeopardise the anchoring of expectations (see Box 2). Nevertheless, the parallel impacts of announcements of asset purchases must be taken into account in these instances as well. According to the BIS study, the announcement of the European Central Bank's forward guidance in July 2013 was able to reduce one-year and two-year futures rates by approximately 7 and 8 basis points, respectively. According to an ECB study (ECB, 2014), however, longer-term interest rates continued to rise temporarily in the period after the guidance was announced, but as the announcements of the Fed's quantitative easing came to an end, the long-term interest rates started to fall once more and five-year yields were eventually reduced to their level of early May 2013.

Overall, forward guidance had an immediate impact on expected futures yields, but the impact varied over time. There are a number of factors, however, that case studies of this kind do not take into consideration: for instance, the decreasing impact over time can be attributed to the fact that the behaviour of the central banks became increasingly predictable for market participants. Furthermore, they did not incorporate a control for events that may have had an impact on futures rates (e.g. the announcement of asset purchases), therefore major conclusions should not be drawn from these.

In the second channel, forward guidance should reduce the volatility of expectations for the future base rate path, since this is a tool that provides additional information on this subject. The results indicate a decrease in the volatility of short-term expectations, but only a slight contraction in the volatility of longer-term ones. This suggests that markets interpret the base rate forward guidance of certain central banks as a commitment for a limited period. The ECB's own calculations suggest, however, that its July guidance successfully reduced the market uncertainty surrounding futures rates.

Finally, the impact of forward guidance on the sensitivity of financial variables to diverse economic news is also a valuable subject for research. Experience from the United States suggests that the financial markets respond differently to information concerning the indicators in a state-contingent commitment if guidance is provided. In the case of intuitively efficient state-contingent guidance, the market interest rates should not respond (too) sensitively to news that is less relevant for the objective of the central bank or even confirm the central bank's assessment of the situation. In the case of the Fed, it was found that one-year futures yields responded less sensitively to certain labour market news. The relation, however, changes over time, and the volatility of the interest futures will grow as the indicator approaches the threshold value in the guidance. The ECB's experience demonstrates that the use of forward guidance has helped

Box 2

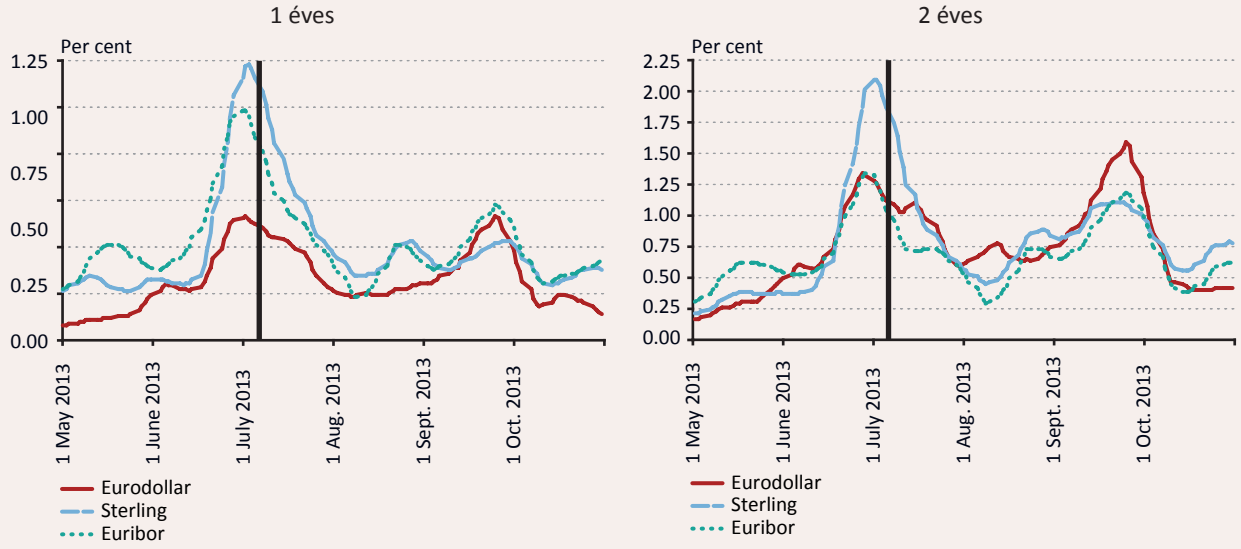
The relation between forward guidance and the various yield curve components

Regarding the first channel, one must remember that financial market (long) yields are of key importance from a central bank and economic policy point of view as indicators of market expectations, risk perceptions and monetary conditions. According to finance literature, two factors determine a market's yield level: the market's expectation of the interest path and the term premium. Forward guidance may impact the changes in both these determinants. Forward guidance can influence the expected yield level via the channel of providing information on the central bank's expected interest policy, the determinants of the same (its assessment of the macroeconomic situation) and the responses given (central bank reaction function). The term premium can also be subdivided into two sets of factors: a component linked to the uncertainty of yield expectations, and the liquidity and structural factors. In terms of the two, forward guidance plays a role in reducing the uncertainty of yield expectations, since transparent communication by the central bank may, in addition to its direct influence on the expected yield, reduce the term premium by increasing the predictability of the central bank reaction function.

The importance of this function rose following the onset of the financial crisis, as central bank reactions to news of economic developments have become harder to predict, leading to an increase in term premiums. It is this type of uncertainty that forward guidance, besides influencing the central projection in the most probable scenario, is intended to reduce and thus to increase predictability (Horváth et al., 2014).

The impact of forward guidance may differ depending on the type of uncertainty it is to reduce. If the communication is intended to reduce uncertainty regarding the reaction function and the future expected interest rate path, then the term premium component will decrease and cause primarily the short-term yields to fall, while longer-term yields may also, although to a lesser extent, shift downwards – in which case the impact is less marked. If the forward guidance provides information about a change in the central bank's reaction function, then market expectations for the interest rate path will change and yields will shift downward accordingly. This too will lead primarily to reduced shorter yields, but an increase in long-term yields is more likely here, due to the uncertainty surrounding the frequent modification of the reaction function or the damage to the anchoring of inflation expectations.

Chart 4
Three-month inter-bank interest rate volatility in 2013



Note: The vertical line designates 4 July 2013, when the ECB gave open-ended state-contingent guidance.
Source: Bloomberg, BIS calculations.

decouple European financial market developments from the Fed's communication of tapering. This is clear from the following: when the Fed started its communication of cutting back its asset purchases ('tapering talk'), the ECB was not using forward guidance and the volatility of European interbank interest rates grew considerably together with the US rates. At the end of the summer, however, when the ECB was already providing its forward guidance, the volatility of European interbank interest rates grew only moderately while US interbank interest volatility returned (the same is true for the increase in UK interbank interest rates) (Figure 4). Furthermore, the ECB's own calculations also reveal that the sensitivity of financial market yields to the incoming data and the information less tied to the outlook in the euro area was lower after the announcement of forward guidance.

CONCLUSIONS

As the recovery continues, one of the questions for the period following the crisis will be whether forward guidance is to remain part of the regular monetary policy toolkit. Some experts posit that increasing transparency is merely a continuation of the trend that began prior to the crisis, which has recently gained momentum and garnered more attention. Under a different approach, the forms of forward guidance applied in the recent past are part of the unconventional monetary policy toolkit used during the crisis and their implementation will not be needed under normal economic circumstances. International experience and our research reveal that forward guidance was widely adopted as a communication tool during the crisis and has become an integral part of the monetary policy toolkit. Although the strategic importance of this communication tool may decrease following the crisis and a loss of relevance of the zero lower bound, the experience of past years shows that the tool has improved the efficiency of monetary policy and is therefore likely to remain part of the monetary policy toolkit.

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Gábor P. Kiss: New Numerical Fiscal Rules for the Pension Balance[1]

At the level of the individual, the pension system is characterised by the payment of contributions and the collection of benefits, both taking place over extended periods that are separated in time. On aggregate, in the coming decades the ageing of society will translate into more people receiving pensions, covered by the contributions of a decreasing number of contribution payers. In line with the EU's fiscal framework, the fiscal rules on the general government deficit include the annual balance of pension payments and contributions; consequently, they fail to provide a suitable incentive for decreasing longer-term imbalances. It may be justified to exclude the pension balance from the coverage of these fiscal rules and to regulate the balance in such a way to ensure that it is maintained over the long term. In this case, the bias for measures with immediate effects (such as an increase in contribution rates) would be eliminated, which, given that the current regulations are focussed on the short term, tend to overshadow other measures with long-term effects (e.g. raising the pension age). Circumvention of this flexible rule can be avoided only if the following two conditions are met. One is the projection of the pension balance in a reliable and controlled manner. The other is that the necessary adjustment cannot be postponed or be avoided by overestimating its effects. Efficient operation also requires a harmonisation of national regulations and the EU's fiscal framework. It is nevertheless important to stress that having separate fiscal rules apply to the pension balance would not mean that the pension system could be separately evaluated. The broader implications of cohort-specific distribution can only be assessed on the basis of on the so-called National Transfer Accounts research project, which records inter-cohort transfers as well.

INTRODUCTION

In any fiscal framework, numerical fiscal rules for debt, deficit or expenditures that apply to certain parts of or the entire general government play an important role. Ideally, these rules must allow for flexible adjustments should external shocks occur. For example, a budget deficit which is maintained year after year at close to three per cent of GDP does not allow for automatic stabilisers to operate in a period of economic downturn, because missing tax revenues must be offset immediately, either by restrictions on the expenditure side or tax hikes, which in turn could exacerbate the downturn even further. If, however, an indicator such as the cyclically adjusted deficit or structural deficit — which filters out effects of fluctuations in the economy — is specified as the target, no fiscal action would be required in response to the decline. The problem here lies in uncertainty: these indicators only function properly insofar as they provide a reliable estimate for the trend of economic output and it is actually the effects of fluctuation that are excluded. In fact, this is often not the case, as evidence of a trend having been overestimated sometimes becomes evident too late, thus preventing fiscal policy from taking corrective action in time.

Of similar importance is the requirement of efficiency, i.e. having fiscal rules contribute to a sustainable structure of revenues and expenditures. Whether we consider expenditure rules or sustainability indicators, uncertainty about trends in economic output can cause similar problems. Moreover, one weakness of the current fiscal rules is their inability to properly handle the parameters that sustainability largely depends on. In defining the medium-term budgetary objectives (MTO), the effects of ageing are taken into account to a certain degree, and thus any change in parameters does matter. At the same time, the future impacts of parameters are ignored when the deficit and the structural balance are determined. As a result, no exception from meeting the annual targets is permitted if, for instance, pension parameters are modified in a way that has no immediate impact on the deficit, but has considerable effects over the longer run. In a biased way, EU fiscal rules consider the differences between long-term and short-term effects only in case of transition to a private funded pension system, that is, when the deficit-increasing effects of contributions transferred to funded schemes are permanently recorded in the public pay-as-you-go system, only to gradually substitute a part of public pension decades later. A necessary condition for correction is to consider whether such a reform

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would improve sustainability over the long term without adding to the risks of a less favourable fiscal position in the medium term. The 2005 reforms instituted under the Stability and Growth Pact had made it possible for this negative effect to be taken into account on a linear degressive basis for a period of five years when assessing the deficit criterion. As part of the so-called six-pack that came into effect in 2011, adjustments for negative effects were permitted for the assessment of the debt and deficit criteria, provided that the deficit does not significantly exceed the 3 per cent limit and the general government debt remains below 60 per cent of GDP.

This article presents a proposal for having the balance of pension expenses and corresponding contribution revenues treated separately from fiscal rules both at national and EU level. This segregation clearly calls for the application of specific fiscal rules, the relevant aspects of which will be discussed in more detail. Our proposal can be used in any pension system and could therefore be applied in every EU member country.

CURRENT FISCAL RULES ARE NOT OPTIMAL FOR THE PENSION BALANCE

Throughout their life, individuals acquire and transfer various types of income. Children receive income/benefits from active members of their family and the government. During working age, individuals provide transfers to children and the government, and partly to elderly parents, while others receive transfers from their parents. The latter receive their income/benefits from the government and partly from working-age members of their family, while others transfer income to them. To describe such a broad range of transfers, the method of National Transfer Accounts (NTA) has been developed as a research project, distributing the national income between co-existing generations (Gál et al. 2014). Using the age profiles of labour income and consumption as the starting point, it is supplemented by the age profiles of various income transfers and capital incomes, ultimately determining how the consumption profile can be derived from the labour income profile. All of this can be used for assessing life-cycle financing, both in and outside households, as well as for developing new statistical indicators of sustainability and re-distribution between generations. The currently used system of generational accounting only deals with sustainability as far as the government is concerned, providing long-term projections on transfers and spending of various future generations in view of projected demographic changes (Auerbach et al. 1991). Projections in the European Union are prepared according to a standard methodology and published by the Ageing Working Group[2] (AWG) every two years. The latest AWG projections cover expenditures in education, healthcare, pension and social security, for the period up to 2060. Future developments in pension expenditures are decomposed according to various factors in order to allow for the separation of budgetary impacts of ageing, the labour market and the parameters of pension schemes.

The question arises as to whether, in view of numerical fiscal rules, a separate treatment of pension may be warranted. As a counter-argument, pension only constitutes a part of the national transfer accounts, which can consider the short-term 'savings' that result from families opting to have fewer children, together with the long-term consequence of having fewer working-age people around to support a proportionately larger elderly population. This latter applies not only to pension expenses but to the costs of healthcare and old-age assistance as well.

The main argument of this article is that, while the context of national transfer accounts is indeed worth considering, as far as fiscal rules are concerned it might still be justified to examine the pension system not only in its coherence but also on its own. As a common feature of all pension schemes, the contributions paid at the individual's level and the collection of pension benefits both take place over extended periods that are separated in time. And while in different pension schemes the correlation between the two may vary, the future benefit is always well-defined, as opposed to other elements of generational accounting (such as healthcare or education). In funded pension systems, contributions during the decades of accumulation are invested to cover future pension payments. By contrast, pensions in a pay-as-you-go scheme are paid out of today's contributions, according to various parameters. While these are presented in more detail in the Appendix, it should be noted here that parameters impact the pension balance over different time horizons. Selection between these temporally different parameters may be distorted by fiscal rules that focus on the financing requirement (and on debt), as their longer-term impacts remain hidden in this context. Neither the structural deficit indicator nor the expenditure rule can take into account the changes of pension parameters that affect future pension expenditures. This important piece of information would not be lost if the pension balance were to receive separate treatment.

What problems could arise in connection with numerical fiscal rules and what solutions would a separate treatment of the pension balance offer?

[2] The Working Group of Ageing Populations functions under the Economic Policy Committee (EPC).

1. According to budget balance rules, deficits must not exceed 3 per cent of GDP, not even in times of crisis. In the event of an economic downturn with the deficit close to 3 per cent of GDP, procyclical adjustment may be required. To avoid this, the deficit must be maintained at a safe distance from said 3 per cent. With our proposal, this 'safety margin' could be lowered by approximately 30 per cent, as that is the proportion of pension contributions to the total tax and contribution revenue.[3] Besides this practical consideration, another argument for separating pension contributions and payments could be that, to a certain degree, these are similar to financing items associated with an explicit obligation of the government.[4]

2. When the medium-term budgetary objective (MTO) is defined for each country, several aspects are taken into account. First of all, it must be ensured that the deficit remains below 3 per cent of GDP even at the bottom of economic downturns.[5] Moreover, a value is set with the intention to ensure sustainability by taking the initial level and future dynamic components (the difference between growth and interest) of debt into account, with the impacts of ageing being assigned a weight factor of 0.33 for expenses in education, healthcare, pension and social security in the period up to 2060. By contrast, our proposal focuses on pension being an obligation of the government — defined to a certain degree — over a time horizon (10-15 years) that can still be relevant in economic policy.

3. The structural deficit estimate includes the potential level of revenues consistent with potential output. This requires that trend and cycle be separated properly. However, experience shows that the potential (trend) value is often subject to revisions. In the case of a downward revision, additional measures might be needed to improve the budgetary position. If pension contributions were treated separately, the extent of such measures would be approximately 30 per cent lower. The pension balance, too, would need improvement, but not necessarily through measures with immediate effect but with parameters with a delayed impact, for instance.

4. According to the expenditure rule, primary expenditures are to be increased at a pace equal to that of potential output growth (and the inflation rate). Therefore, this rule is sensitive not to the level, but the growth rate of potential output. If potential growth rate estimations are adjusted downward, revenues will be automatically decreased and, as the expenditure rule provides less room for growth, the expenditures side will be adjusted as well. The problem is that, as far as spending is concerned, pension expenditures are pre-defined based on pension parameters and demographics. Their development is not aligned to the path of potential growth or inflation; steeper or less inclined changes are equally possible. By looking at the pension balance on its own, it becomes evident that estimations of potential growth rate do not have a neutral effect. Changes in contribution revenue are in line with estimated growth rates, but pension expenditures only follow suit if and to the extent that indexation is linked, besides inflation, to a real variable as well.

ILLUSTRATING THE SEPARATED PENSION BALANCE

Charts 1 and 2 present — somewhat extreme — scenarios to illustrate the distortions referred to in the previous section.

- The trend and cyclical fluctuation of contributions demonstrate that the nominal deficit is also distorted due to the cycle, and this could require procyclical deficit reduction in the case of recession.
- Neither the structural deficit nor the expenditure rule takes pension expenditure forecasts into account; for example a slower growth rate in expenditures that is caused by a gradual increase in the retirement age remains hidden (while gradual effects are shown on the charts).
- Chart 1 shows the uncertainty of the structural deficit that is caused by the actual estimations of potential output level.
- Chart 2 demonstrates possible distortions of the expenditure rule, caused by uncertainties surrounding the potential growth rate.

As seen in Chart 1, pension balance can be achieved with contribution trend #1 over a 15-year horizon. Problems can occur if it becomes evident that assuming a less favourable initial level for potential contributions is more realistic. This would require adjustments to some pension parameters in order to restore the balance. However, the actual balance is determined by the actual revenue, not the underlying trends. With the numerical values constructed in our example, up until year 5 it remains uncertain as to which trend (initial level) of contributions is consistent with the actual data.

[3] The budgetary impacts of the economic cycle are realised mostly through fluctuations in tax and contribution revenues and, to a much smaller extent, in changes in unemployment benefits.

[4] While debt is not discussed in our article, we do note that SNA2008 and ESA2010 contain new provisions regarding the statistical recording of implicit pension liabilities. For further details see: van der Wal (2013).

[5] Its value (safety margin) is estimated based on the volatility of output and determined by ensuring a low probability for the negative extreme of the output gap.

Chart 1
Pension balance projections in case of uncertainties in potential output

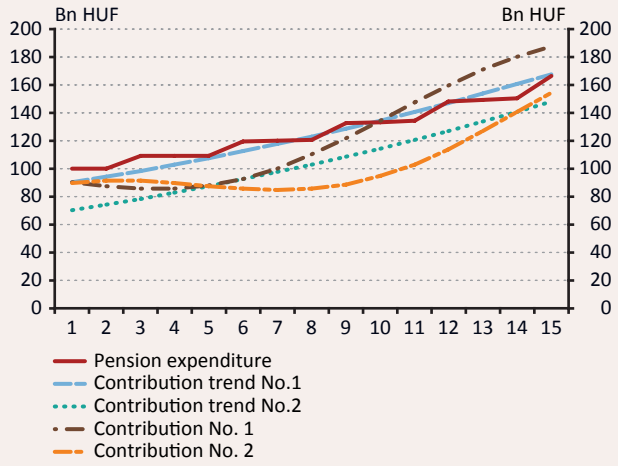
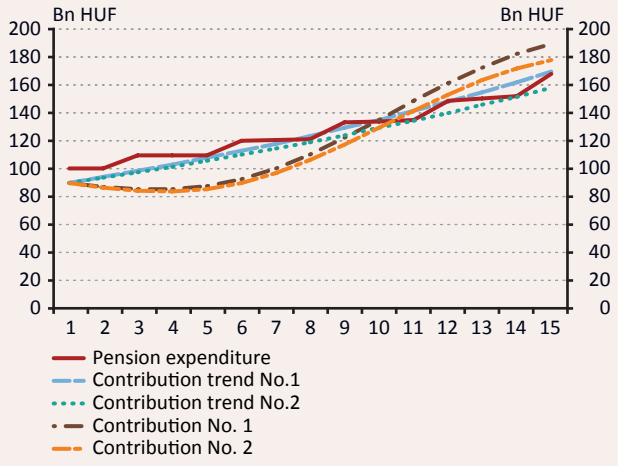


Chart 2
Pension balance forecasts with uncertainties surrounding the growth rate



The effects of uncertainty of the growth rate — and not the initial level of potential output — are shown in Chart 2. Here too, the pension balance is achievable at a 15-year horizon in the case of contribution trend #1. However, with trend #2 assumed, this cannot be achieved unless pension parameters are adjusted appropriately. It should be noted that the revenue/expenditure balances shown in the above two charts do not represent the accumulation or depletion of actual financial assets. They simply illustrate that the balance cannot and must not be compared with the balances of other budgetary items. In the case the pension balance turns into a surplus, for instance, the three per cent deficit rule should be met without this, which might require additional adjustments. In the opposite case, a deficit would not necessitate adjustments to other items, leaving more room for budgetary manoeuvre.

POSSIBLE RULES ON THE SEPARATED PENSION BALANCE

A separated pension balance can only be exempted from currently effective rules if, at the same time, a new set of fiscal rules is established, otherwise it could be circumvented. One option for circumvention is to extend the scope of rules to a wider range of parameters than those discussed, thereby covering certain social expenditures. The conditions of operation can also be manipulated, by having the time horizon re-defined, for instance. Another problem is that projections can also be deliberately biased. Finally, decisions required to ensure the pension balance may simply be delayed (for a variety of reasons), which can lead to constant incompliance with the rule. This section seeks to provide solutions to these practical problems.

Separating pension expenditures and revenues requires the following five key criteria:

1 The national rule shall be harmonised with the EU fiscal framework.
2 Pension balance shall include old-age provisions and, optionally, survivor's benefits. However, it may not comprise social benefits that are disbursed depending on an individual's health and social status (disability benefits and poverty benefits).
3 It shall be required to maintain the pension balance over a specific time horizon. The definition of the specific time horizon needs to be regulated at the Community level.
4 Whether balance is achieved within the specific time horizon — as well as the applicable methodology — shall also be assessed at the Community level.
5 Although ensuring a balanced position under the above conditions shall remain a national responsibility, each member state shall also operate an automatic correction mechanism in case this cannot be achieved.

Harmonisation of the national rule with the EU fiscal framework

At the national level, it is possible to have certain budgetary items excluded from regulations.[6] It is nevertheless important that national rules be harmonised with EU regulations, otherwise they would conflict with one another — in which

[6] In Sweden, for instance, the stability fund established to cover the bank bailout operations is included both in the deficit and the general government debt, but applicable expenditures are exempted from the Swedish spending rule.

case EU regulations may override the national rule, preventing its full effect. The easiest way to achieve harmonisation would be to have the national rule incorporated into the EU framework, with the latter regulating key parameters at the Community level (see conditions 3 and 4 above).

A proper definition for the separated pension balance

If possible, the pension balance should represent a clearly defined system that is used for re-distributions between contribution payers reaching various ages. Optionally, it may also include survivor's benefits, which are more closely related to old-age pension than to social benefits. However, other provisions such as disability benefits, which are disbursed due to impaired health, as well as other social benefits that are paid to combat old-age poverty, should be excluded from the pension balance.[7] Distinguishing these latter is not that simple, as beneficiaries include not only those who have not earned any entitlement (who thus solely receive social benefits), but also people having been paying the minimum contribution and are therefore entitled to pension, the amount of which might not, however, be sufficient to provide for one's living. It is recommended that supplementary benefits disbursed to this latter group are operated outside the pension balance. In some countries, the lack of entitlement and insufficient pension amounts can pose significant problems, whereas in others where a minimum pension is granted, old-age pensions also contain social elements.

Another definition issue can be identified in the case of contributions. Contribution allowances granted by the government should be recorded as imputed contribution.

Specifying the relevant time horizon

If the pension balance is no longer considered to be part of the deficit, it should be possible to respond to the ageing-induced balance deterioration not through revenue-increasing measures with immediate effect but by relying more on measures with a gradual effect. For similar considerations, the European Union's fiscal framework introduced the option to adjust the deficit with the balance-deteriorating effect of certain types of reforms in a linearly decreasing way in a period of 5 years. In our case, five years might not be sufficient, as changes in pension indexation is a measure with gradual effects that reach far beyond five years. Even the changes in regulation affecting retirement age exceed this period — here, it is life expectancy after retirement that determines when pension expenditure will be reach the new level. Since life expectancy after retirement in different countries may vary, this is regarded as a country-specific factor. Nevertheless, several arguments can be raised against a very long time horizon. Firstly, such long-term projections are surrounded by greater uncertainty. Secondly, over this time horizon, imbalances of such magnitude can be forecasted in a number of countries that would take significant measures to offset. A shorter time horizon could allow for a more gradual adjustment.

What methodology can be used to determine whether a balanced position has been achieved?

If we are to assess the pension balance over a specific time horizon, we must also determine how revenue and expenditure projections will be made, as well as the discount factor at which current price factors can be summed up. Using the results of the Ageing Working Group as a basis would seem appropriate for the projections. As for the discount factor, besides the nominal economic growth rate, the use of a higher index could also be considered. The reason for this lies in the uncertainty of the future, as it might be worth assigning a relatively larger weight to the balances of years less distant in time, which in turn can imply faster adjustments. However, as a counter-argument, this could reinforce the role of revenue-increasing measures with immediate effect (albeit this incentive is less strong than the one implied by the currently applied approach, which only focuses on deficit over the short term).

Automatic correction mechanism for achieving a balanced position

As mentioned earlier, a broader approach of generational accounting — one that also recognises intra-family transfers — is a complex method. There is no consensus as to how this can be taken into account when establishing the various parameters of the pension system. Moreover, decisions concerning the pension system affect the broadest segments of society. Obviously, this should remain in national competence; this field may not be restricted by the EU and cooperation could be based only on voluntary commitments.[8]

[7] At present, pension schemes in Europe are fundamentally different in their accrual methods used for old-age pension, which depends on wages and service time, and for social benefits. In the future, pension systems shifting towards basic benefits might be seen as an obstacle to having the pension system separated from social and healthcare expenditures.

[8] The only widely accepted regulation is the International Labour Organisation's Social Security (Minimum Standards) Convention, 1952 (No. 102), which has been ratified by numerous countries worldwide. Article 65 stipulates that, after 30 years of contribution or employment, a minimum replacement rate of at least 40 per cent shall be applied. In other words, both DB and DC pension schemes (see the Appendix) shall guarantee this minimum or, alternatively, a minimum accrual rate of 1.33 per cent of previous earnings for each year of contribution or employment.

At the same time, just as the necessary consolidation of the general government deficit can be delayed, so could adjustments of the pension position over the specified time horizon be postponed. To prevent this, an automatic correction mechanism needs to be introduced, which can take over if decisions cannot be made. This could be similar to the provisions of the fiscal compact that was approved by the Member States in late January 2012 stipulating that, in the case of significant observed deviations from the MTO or the adjustment path towards it, an automatic correction mechanism should be triggered. This mechanism should aim at correcting such deviations by implementing measures taken over a defined period. The common principles and applicable time frames of correction are set out by the European Commission by way of Directives.

CLOSING REMARKS

In different pension schemes, the impacts of ageing may vary. In a funded system, a slowdown in economic growth can gradually decrease capital gains, meanwhile those reaching retirement age can only expect to collect more modest pensions. In the pay-as-you-go scheme, it is the annual indexation of pensions that has an automatic effect, also impacting the long-term developments in total pension expenditure. There are some EU Member States where other pension parameters can be modified more or less automatically: for instance, retirement age may be linked to life expectancy, allowing for savings to be realised on the retiring population. However, it often depends on the discretionary decisions of fiscal policy as to what parameters will change or which cohort is to bear the burdens. Changes made to the parameters of the pension system must not be evaluated in terms of their fiscal impacts in the short term, but over a more extended time horizon. That, however, is not possible if the pension balance is subject to conventional fiscal rules. Our article has therefore summarised arguments both for and against the pension balance being a specific fiscal rule that is subject to separate treatment. Some of the arguments against the proposal are based on the possible circumvention of such rules. That is why we discussed in detail the conditions of regulation that may be considered as requirements for safe operation. For instance, while it is necessary to have a balanced pension position for the medium or long term, the applicable time horizon would need to be defined at the Community level, as would the estimation of imbalances over this period. We have established that decisions involving the pension system and its parameters should remain in national competence; however, in case these measures are delayed, automatic correction mechanisms must be triggered — likewise at national level. This could help prevent situations where decisions ensuring balanced position can be postponed for prolonged periods of time. In order for the proposed scheme to function appropriately, a harmonisation of the national rule with the EU's fiscal framework would be a priority. Nevertheless, it should be emphasised that having the pension balance be subject to separate fiscal rules cannot mean that the pension system could be evaluated outside the broadest approach of generational accounting. During their working years, pensioners were paying various other taxes and after retirement they remain entitled to healthcare and social benefits, while at the same time they continue to pay consumption-related taxes and even their pension might be taxable. According to a recent survey, while pensions in Hungary were the highest in all of the Visegrad Countries, the government provided fewer healthcare services to pensioners. At the individual's level, the range of health benefits actually used may vary greatly: people living longer can have access to more benefits but, due to the introduction of stricter indexation rules, their pension could gradually lag behind, in relative terms, when measured against the standard of living of active families. Moreover, the benefits received are also not proportionate to the contributions paid during one's active years, either — an observation in which tax avoidance makes a significant difference. The self-employed or those working in the shadow economy often pay only the minimum contribution requirement. As noted in the introduction, it is not practical to have generational accounting limited to government revenues and expenditures. At the individual's level, intra-family accounting can lead to even more pronounced differences, as the amounts spent on raising children vary across a wide range. A suitable framework for analysis can be provided by complete national transfer accounts that, broader in scope even than conventional generational accounting, also take intra-cohort transfers into consideration.

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Appendix: A brief overview of pension schemes

Our article discusses pensions from the perspective of fiscal rules. As a supplement to this, the following section contains a brief presentation of the types of pension schemes that are currently in use, as well as their key parameters. When compared with the accumulation of savings at the individual's level as a possible alternative, all pension schemes have the common feature that they provide some sort of "insurance" to the recipients.[1] Correspondingly, old-age pension can provide security to individuals reaching an above-average age, whereas survivor's benefit is intended for family members to cover the risks of being left alone. Although numerous pension schemes exist in international practice, with a little simplification they all can be classified according to the following two considerations. One has to do with the object of pension rules, as these can define either the service (benefits) or the contribution. According to the other consideration, it is assessed whether future expenditure is funded or not, in the latter case the actual contribution revenue will finance the actual pension expenditure. Based on these two considerations, four pension schemes can be distinguished.

Table 1
Types of pension schemes

	Defined Contribution (DC)	Defined Benefit (DB)
Funded	funded (DC)	not applicable to universal pension
pay-as-you-go	nonfinancial defined contribution (NDC)	public pension (DB, points system, PS)

Most funded pension funds are private funds

In a funded pension scheme, there is a relatively close relationship between payment and service: contributions paid at the individual's level are invested, after which pension is disbursed in the form of annuity according to a specific set of rules (DC). If the contribution payer dies before retirement, survivors can have inheritance rights over the remaining benefits. In order to solve the problem posed by society's ageing, funded pension schemes offer a continuously diminishing capital gain due to the slowdown in economic growth and, given the rising life expectancy, also decrease the annuity amount, thus people retiring will be receiving increasingly modest provisions. An exception is when there is a minimum level of benefits or capital gains guaranteed by the state. Calling this guarantee will increase the general government deficit, the offsetting of which requires measures by the government (e.g. tax hikes, spending cuts or lowering the guarantee level).

Public pension funds are typically unfunded

In a pay-as-you-go scheme, the link between contributions and service is weaker: at the individual's level it is not the contribution that defines the service and, by and large, all contribution revenues are used immediately to cover pension payments[2] Given that pay-as-you-go is unfunded, inheritance can be problematic: in this case, state pensions may be substituted by survivor (dependant) benefits but, if the contribution payer dies before retirement, all entitlement can be lost.

The notional, or nonfinancial, defined contribution (NDC) scheme is similar to its funded counterpart in that there is a direct relationship between the amount of pension that can be collected and the amount of contributions paid. However, since it is unfunded, an individual's notional capital balance is determined, instead of by actual investments, using specific

[1] The contributions paid will result in a person's entitlement to pension — this is an evident relationship between payments (contribution) and benefits that exists for virtually no other element of the general government budget (and is exactly what distinguished public from private – i.e. market - transactions, where, by definition, payments [price] and benefits [service] are closely related).

[2] As a special case of the pay-as-you-go scheme, contributions can be transferred to a fund where it is the sponsor, and not the individual, who enjoys the benefits and takes all the risks. In practice, the sponsor is usually not the government but the employer, as this scheme is mostly prevalent among corporate pension funds. Hungary's public sector experienced limited attempts at this in the 1990s, when securities were transferred from the budget to the Social Security Fund.

reference (benchmark) yields.[3] Government guarantees can also be provided by which to ensure a certain pension level.

In all other public pension systems, an individual's pension is determined by previous earnings.

- Pension (DB) is most frequently defined through the valorisation of earnings and based on a replacement rate (the proportion of pension to final wages before retirement). In this practice, degression can also be observed in case ceilings, minimums and differentiated valorisation (indexation) are applied.
- In some countries, entitlements are determined using a point system, whereby the pension amount represents the quotient of earnings and a continuously valorised score (PS).[4] Degression may be possible.

Given the ageing of society, these methods for calculating pension can lead to growing imbalances. For the sake of simplicity, the impact of ageing can be expressed as an increase in the proportion of the population above 65 compared to the 20-64 year old cohorts.[5] At the EU level, this could translate into a 2.2 per cent increase in pension expenditure as a percentage of GDP between 2010 and 2020, and another 2.4 per cent during the 2020-2030 period (European Commission, 2012). Balanced positions can be restored with the adjustment of various pension parameters — with different cohorts required to bear the associated burden. Other than the automatic annual indexation of pension, any other change in parameters is subject to discretionary decision; however, there are some EU countries where certain parameters are modified more or less automatically. Having the retirement age linked to life expectancy is a good example for this.[6] The so-called sustainability factor has a similar role, as it changes the size of the pension benefit depending on expected demographic changes such as the life expectancy at the time of retirement.[7] In view of the above, pension expenditure as a percentage of GDP in the EU27 can remain virtually unchanged between 2010 and 2020, with only a 0.6 per cent increase projected for the 2020-2030 period (European Commission, 2012). Therefore, if the pension balance were to be regulated in a forward-looking approach over a 15-year horizon, certain measures would be required in order to achieve a balanced position for the 15-year average.

The problem lies in the fact that the EU average conceals the high rate of deviation in the changes (and even the sign) of pension expenditures, which can only be partially explained by the diverse effects of ageing itself. However, to a certain degree, it is the impacts of measures already taken, or automatisms already implemented, that make a difference, which could actually yield a surplus on a 15-year average in some countries. In the following, potential measures by which to adjust the pension balance will be described.

As regards the establishment of old-age (own right) pension, the three public pension schemes used in EU Member States (NDC, DB and PS) share the common feature that they all have entitlement defined, with the use of certain parameters, based on earnings (or the applicable contributions paid in NDC) in different years during employment. (For general formulae, refer to Queisser-Whitehouse, 2006.) The result can be expressed as the ratio of pension to pre-retirement earnings, also called the replacement rate. The retirement date is an important parameter, as early retirement (where permitted) is "penalised" (malus) and rewards are introduced for later retirement (bonus). (This is an automatic process in NDC, for more information on its impacts, see Simonovits, 2013.)

As an example, below are the parameters of the pay-as-you-go pension scheme, listed according to their impacts on the pension balance.

1. Measures with immediate and permanent effect, such as raising the contribution and the direct taxes (or contributions) on pension expenditure. Since the former affects the active population's tax burden and the latter involves the inactive cohort, their economic impacts vary.

2. Measures with immediate effect that are reversed over the medium and long term. These include the broadening of the contribution base (e.g. by eliminating the contribution ceiling), the effects of which will gradually — but not necessarily with the same size — reverse through the increases of newly established pensions.

3. Gradual measures that lead to stabilisation over time (when pensioners collecting their entitlement according to the

[3] Within the European Union, this type of public pension fund is used in Italy, Latvia, Poland and Sweden (AWG, 2012).
[4] Germany, Romania, Slovakia and, in part, France (AWG, 2012).
[5] Mitigating the impacts of ageing is the gradual trend that people are staying active longer and the elderly lose their work capacity at an increasingly later age.
[6] Spain, Italy, Czech Republic, Greece, the Netherlands and, subject to confirmation by parliament, Denmark (AWG, 2012).
[7] Germany, Finland, Spain, Italy, France, Latvia, Poland, Portugal and Sweden (AWG, 2012).

new regulations completely replace those having retired under previous rules). These include the parameters of newly established pensions — the pension formula, the rules of retirement, the proportion of survivor's benefit and the regulations concerning the duration and commencement of entitlement — for both own right and survivor's benefits.[8]

4. Measures with gradual effect that do not necessarily disappear at some point. For instance, inflation indexation applied to pensions will continue to generate savings as long as the economy is characterised by real growth and an increase in the real wage index.

[8] A similarly adjustable parameter in funded pension schemes is the level of government guarantees, which is subject to applicable conditions (pension amount is to decrease below the guaranteed level).

Appendix
MNB Bulletin Articles (2006–2014)

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Péter Bauer (2014): Corporate profitability and labour market adjustment – findings of a micro data study

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