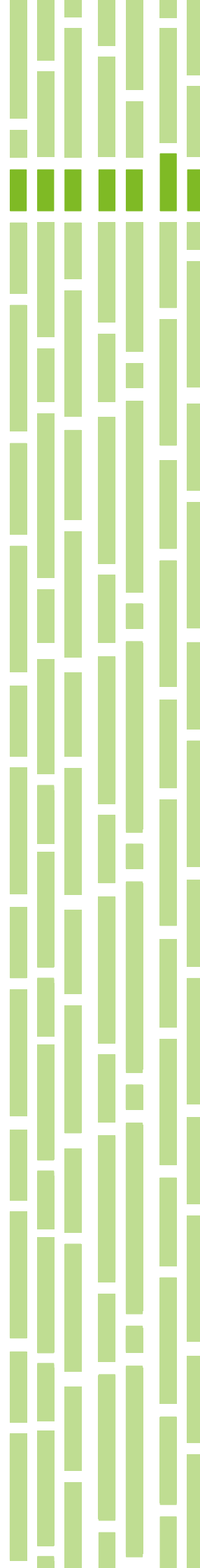


PUBLIC FINANCE REVIEW  
May 2012



MAGYAR NEMZETI BANK





# Projection of the fiscal balance and public debt (2012–2026)

**PUBLIC FINANCE REVIEW**  
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*In order to support its fundamental functions as set forth in Act CCVIII of 2011 on the Magyar Nemzeti Bank ('MNB Act'), in particular its function relating to the formulation and implementation of monetary policy, the Magyar Nemzeti Bank analyses developments in the budget deficit and debt, monitors the financing of the general government, analyses the effects of financing on monetary developments, money market trends and liquidity and conducts research on fiscal policy issues. Pursuant to the MNB Act, the MNB expresses its opinion on the Bill on the Central Budget as approved by the Government.*

*Pursuant to Act CXCV of 2011 on the Financial Stability of Hungary, the Governor of the MNB also serves as a member of the Fiscal Council (FC) and in that capacity he contributes to the opinion of the FC on the budget bill proposed for submission to Parliament. Pursuant to that Act, instead of the FC's independent staff, the work of the FC is indirectly supported by the expertise and information which is already available at the MNB anyway. At the FC meeting, the opinion of the MNB on the budget bill is presented by the MNB Governor, who is not bound by the opinion thus represented when exercising his discretionary rights as a member of the FC.*

*In order to promote performance of the aforementioned responsibilities in line with the highest professional standards, the experts of the MNB regularly analyse fiscal developments. The key results of those expert analyses are disclosed to the general public in the publication 'Public Finance Review'. The findings and conclusions in the analyses reflect the views of the experts involved in the preparation of the analysis and should not be interpreted as the views of the MNB or the Monetary Council.*

This analysis was compiled with the participation of the Financial Analysis, Monetary Strategy and Economic Analysis as well as the Financial Stability Departments, under the general direction of Director Áron Gereben and Judit Antal, Deputy Head of Financial Analysis. The project was managed by Csaba Fehér, senior analyst of Financial Analysis. Publication of the analysis by the MNB was approved by András Simor, Governor of the MNB.

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# Summary

## KEY MESSAGES

- Based on the assumptions used in our projection, gross public debt as a percentage of GDP may fall from 80.6 per cent at end-2011 to 59.4 per cent by 2026.
- This debt level satisfies the 60 per cent criterion set forth in the Maastricht Treaty and the debt trajectory complies with the so-called "one-twentieth rule" adopted by the European Union in 2012. On the other hand, the debt exceeds the 50 per cent target laid down in Hungary's Constitution. Achievement of that target would require either a growth rate consistently above our assumed level or measures to strengthen investor confidence to secure lower costs of funding or additional improvements in the fiscal balance.
- Following a temporary fluctuation, the primary balance of the general government, net of interest expenditures, shows an improving trend over the projection horizon, stabilising at around 2 per cent of GDP in the long run. The primary balance is able to offset the increase in debt which results from the annual financing cost exceeding the long-term growth rate of 2.5 per cent by 0.8 per cent, and assures the declining trend in the debt ratio.
- The temporary setback in the primary balance up to 2016 is caused by the discontinuation of certain revenues (termination of special taxes the 'half supergrossing of the personal income tax' and private pension fund revenues, reduction in EU funds) and by new expenditure items (such as the implementation of the career model for teachers). In the medium term, however, the parametric and paradigmatic reforms of the pension system (indexation, retirement age increase, tightening of eligibility criteria and transformation of the disability benefit system) will substantially improve the primary balance.
- The measures in the Structural Reform Programme 2.0 will steadily improve the primary general government balance – we estimate the improvement to be 1.4 percentage points annually from 2015 on – and will thus be instrumental in reducing the debt ratio.

- In addition to the primary balance, both economic growth and financing costs have a major effect on the growth rate of debt. Our analysis shows that one half-per cent change in the growth rate moves the debt-to-GDP ratio in 2026 from the value in the baseline scenario by 3.4 percentage points, while a 1 per cent change in financing costs from 2017 on would result in a change of 3.9 percentage points as compared to our base assumptions.
- We should emphasise that our review is a so-called technical projection rather than a forecast. This means that instead of the most likely scenario, it presents the deficit and debt trajectories expected assuming no change in current economic and sectoral policies.

## PURPOSE AND FRAMEWORK OF THE ANALYSIS

The analytical publications of the Magyar Nemzeti Bank concerning the general government typically look at a two-year horizon at most. Frequent, short-term analyses facilitate the fine-tuning of forecasts in light of the economic developments observed. However, they are not suited for outlining the longer-term trends or the fiscal effects of certain policy decisions which take several years to generate their intended impact.

This publication, focusing on longer term processes, is meant to address that deficiency. It looks at the development of public debt in the upcoming fifteen years, the conditions required to achieve the 50 per cent debt target set in the Constitution and the 60 per cent level required under the Maastricht Treaty.

To that end, our publication

- briefly explains how the current level of public debt was reached and the main factors affecting debt dynamics in recent years;
- analyses the expected developments of the position of the general government in the 2012–2016 period, with particular attention to processes affecting the primary

balance and the expected impact of recent adjustment measures;

- assesses how the initial debt level, the primary balance, interest payments and the rate of economic growth will affect the development of public debt in the coming 15 years, assuming that current economic policies remain unchanged. In this context, we place particular emphasis on the expenditures affected directly by changes in the demographic composition of the population;
- examines the sensitivity of the debt path to some fundamental assumptions: the EUR/HUF exchange rate, expected government bond yields, the divergence of the growth rate from the baseline, and any improvement or deterioration of the position of the general government by 2016, in excess of the level incorporated in the baseline;
- compares the projected debt path with the key debt rules relevant for Hungarian fiscal policy (Maastricht criteria, debt rule in the Constitution, the “one-twentieth rule” of the EU adopted in 2012) and establishes the additional balance improvement required to comply with each requirement over the 15-year time horizon of our review.

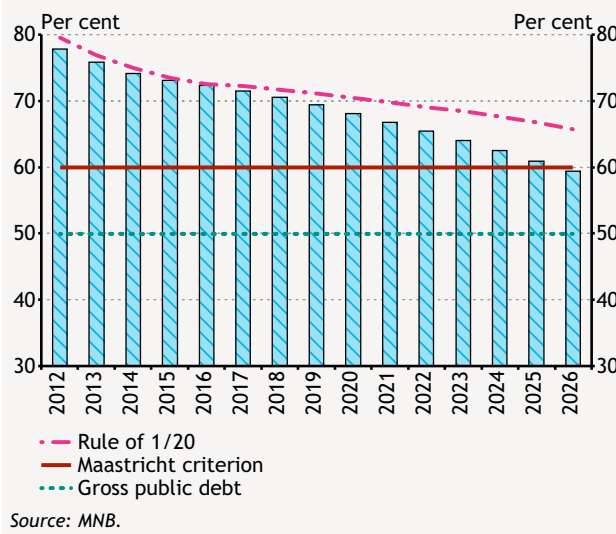
Since our analysis assumes that current fiscal policies remained unchanged, the debt and deficit calculations presented should be viewed as technical projections and should not be construed as forecasts. In other words, instead of representing the most likely scenario, we present a fiscal projection which assumes a so-called “no policy change” environment.

We should note that the uncertainty of the deficit and debt trajectory and of the underlying trends increases along the projection horizon. The uncertainty is attributable partly to the accumulation of unavoidable errors arising from the methodologies applied, partly to the uncertainties inherent to projecting macroeconomic developments, and partly to the constraints on incorporating the behavioural responses and feedback loops of economic policy behaviour.

## RESULTS

Based on the assumptions used in our projection, the gross public debt as a percentage of GDP will fall from 80.6 per cent at end-2011 to 59.4 per cent by 2026. The medium-term path of public debt is determined by the primary balance and debt level achieved by the end of the present economic cycle in 2016, the assumptions concerning the growth rate, financing costs and the HUF exchange rate as well as expenditure items sensitive to demographic changes.

**Figure 1**  
Public debt-to-GDP – results of the projection



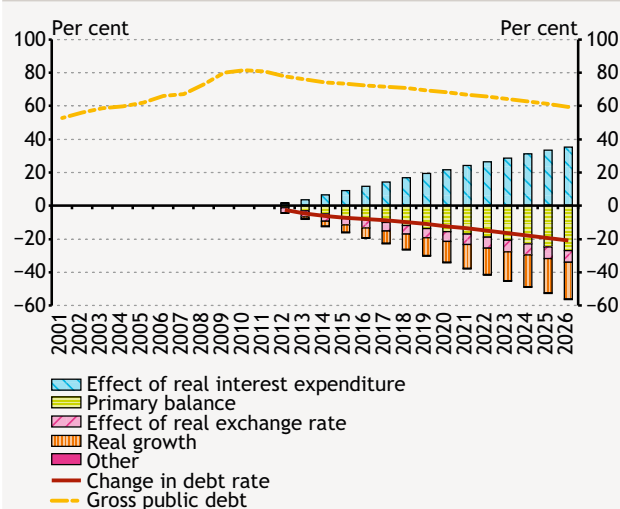
The projected gross debt-to-GDP ratio of 59.4 per cent in 2026, which corresponds to the average of the 8 years preceding the crisis, meets the 60 per cent Maastricht debt criterion. Furthermore, the debt trajectory also satisfies the so-called “one twentieth” rule introduced as part of the fiscal package of the EU approved in 2012, which provides that Member States must reduce the part of their public debt in excess of 60 per cent of GDP by one twentieth of that excess debt each year. Nevertheless, the debt projected for 2026 continues to exceed the 50 per cent target laid down in Hungary’s Constitution. If the debt target of the Constitution is to be met by the end of the 15-year projection horizon, either 1) a growth rate consistently exceeding the baseline scenario, or 2) measures to increase investor confidence in order to reduce the interest cost of debt, or 3) further fiscal balance improvement is required.

If the cost of financing declines at the rate assumed in our projection and the growth potential of the Hungarian economy does not increase, the debt target set in the Constitution will require an additional 0.9 per cent permanent fiscal balance improvement, as a percentage of GDP, from 2017 on. By way of comparison, we estimate that the lasting net effect of the Structural Reform Programme 2.0 amounts to approximately 1.4 per cent in the medium term.

In terms of the three main factors influencing the debt ratio – the so-called primary balance of the general government net of interest expenditures, the funding cost of existing debt and the growth rate of the economy – we have made the following key assumptions:



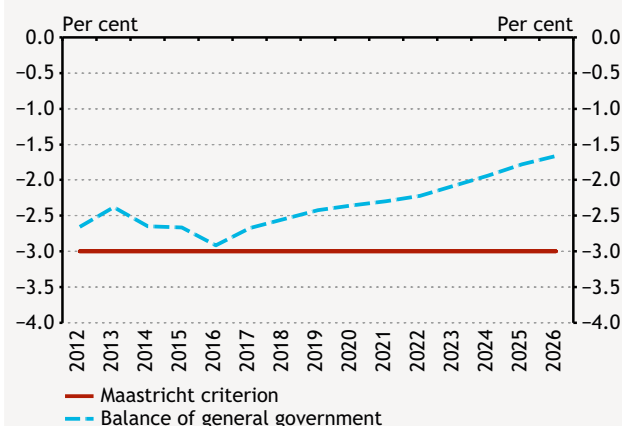
**Figure 2**  
Growth rate and decomposition of public debt, 2001–2026



Source: MNB.

- The *primary balance of the general government* will show an improving trend, but this improvement will be interspersed with wide fluctuations: it will move between 1.3 per cent and 1.7 per cent between 2012 and 2016, gradually climbing to 2 per cent of GDP thereafter from 1.4 per cent in 2016. In the period between 2013 and 2016, the temporary setback in the primary surplus is explained by the inability of expenditure cuts and revenue increasing measures to offset the effects of revenue reducing measures and trends (such as the phase-out of special taxes and the 'supergrossing', the absence of one-off revenues from the acquisition of pension fund assets, the decline in EU funds) and expenditure increasing measures (for instance, the career path model for teachers). In the medium term, however, the reforms of the pension system and the measures of the Structural Reform Programme 2.0 will improve the primary budget balance. Our projection shows that the latter package will improve the general government balance by 0.2 per cent of GDP in 2012 and by 1.4 per cent per year after 2013 on average.
- In respect of *financing costs*, in the medium term we expect a substantial lowering in the risk premium, which has a major effect on costs; though we assume that on the projection horizon the premium will not return to the consistently low level seen in the pre-crisis era. For HUF-denominated government securities, this means real interest rates slightly below 4 per cent, which is 0.9 percentage points higher than before the crisis. Taking into consideration the slightly lower yield required of foreign currency debt and the effect of the changes in

**Figure 3**  
ESA balance of the general government, 2012–2026



Source: MNB.

real exchange rates, the adjusted implied interest rate is 0.8 percentage point higher than the GDP growth rate.

- In terms of *economic growth*, after the end of the current business cycle (from 2016 on), we reckon with potential GDP growth to gradually climb from 2.1 per cent per year to 2.5 per cent (which appears to be a reasonable assumption in light of the convergence to developed European countries as well as the expansion of the factors of production). In our projection, we assume the terms of external financing to gradually improve during the period and the economy to resume the path of convergence.

We have performed sensitivity analyses to highlight the relationship between the outcomes and the assumptions used:

- *Growth*: a 0.5 per cent divergence from the baseline growth rate starting in 2017 causes a 3.4 percentage point movement of the debt ratio in the opposite direction by the end of the projection horizon.
- *Exchange rate*: the sensitivity of the change of debt between 2017 and 2026 to a 10 per cent change in the exchange rate is approximately 2.9 per cent.
- *Interest rate*: A 1 percentage point shift in the yields of HUF and FX bonds in 2017 results in an approximately 3.9 percentage point change in the debt by 2026.
- *Primary balance*: if the primary balance of the general government shows a 0.5 per cent difference from the balance used in the baseline scenario in each year from 2017 on, the debt level in 2026 will be 5.2 per cent of GDP lower or higher.

The results of the sensitivity analyses must be viewed with reservations for several reasons. On the one hand, we were unable to examine and filter out the interrelationship of the main components affecting debt growth. For instance, in the event of substantial fiscal tightening we expect a temporary setback in growth, which would slow down the reduction of the debt ratio while the risk premium may be reduced and in the longer term, growth may accelerate compared to its previous level. Similarly, the strengthening

or weakening of the exchange rate has different, asymmetrical effects on household consumption, import intensive and exporting sectors and consequently on growth, consumption and budget revenues. In contrast, a one per cent improvement in the primary balance and a one per cent strengthening of the exchange rate would cause changes of different orders of magnitude compared to the baseline, and thus the probability of their occurrence is also different.

# 1 Introduction

## 1.1 OBJECTIVES AND CONSTRAINTS

The purpose of the *Public Finance Review – projection of the fiscal balance and public debt (2012–2026)* is to project the development of gross debt and its key drivers based on clearly defined technical assumptions and to compare the results with the constitutional and EU debt rules relevant for Hungarian fiscal policy. We intend to prepare such projections once a year in the future; moreover, from 2013 on we also plan to present the effects that measures adopted since the previous publication may have on public debt.

Our analysis is compiled with a bottom-up approach, meaning that revenue and expenditure items are projected individually. The projections reflect the effects of recent fiscal measures and the macroeconomic assumptions.

Our analysis took into account the measures already codified as well as the ones for which the regulatory plans of the Government, or of the European Commission as the case may be, were available in sufficient detail. Information published after 30 April 2012 was not incorporated into the analysis.

The review does not set out to put forth policy recommendations beyond the presentation of the fiscal balance and the gross debt trajectory. In other words, it does not address the possible policy implications of compliance with the presumed debt targets of EU and Hungarian legislation, nor does it identify any policy measures that may be required to achieve such targets.

## 1.2 TIME HORIZON OF THE PROJECTION

There were a number of considerations that led us to choose a 15-year horizon:

- We considered it important that the selected time horizon should facilitate the identification of demographic changes, as ageing will be the most important and already perceivable trend in the decades to come. As the horizon extends, the effects of demographic processes become increasingly visible.

- The longer the horizon, the more need for assumptions relating to technological change, productivity, propensity to save, behavioural effects – factors that we have no information on; the longer the projection horizon, the more these subjective assumptions dominate the result.

- We considered it important to select a period that is meaningful and relevant for present-day decision makers.

If required for the interpretation of the results or if new arguments arise, we shall consider lengthening the projection horizon in similar publications of the coming years.

## 1.3 DISTINCTION BETWEEN PROJECTIONS AND FORECASTS

From a methodological aspect, the result of our review is a so-called *technical projection* rather than a *forecast*. This means that we set out to present the deficit and debt trajectories which arise if we assume that current economic policies and the fiscal environment remain unchanged. This set of assumptions rarely, if ever, coincides with the most likely scenario. To put it differently: the question we were trying to answer was not what would happen with the highest likelihood, but what would happen if current policies and behavioural patterns continued unchanged in the future.

## 1.4 WHAT DOES UNCHANGED FISCAL POLICY MEAN?

The interpretation of unchanged fiscal policy (“current policy” assumption) in terms of the development of the primary balance underlying our debt projection is often far from trivial. This is particularly true, given the relatively long, 15-year time horizon of our analysis.

In the case of a projection for a shorter time horizon of a few years, constant policy generally means the incorporation in the analysis of legislation already enacted or at least announced and known in sufficient detail. In the perspective of a small number of years, the majority of budget items can be reliably quantified based on the effective legal regulations and substantive legislation.

By contrast, analyses with longer time frames run into the constraint that current laws either fail to regulate the course of the budget item concerned over time, or the long-term course defined by legislation will yield clearly unacceptable policy outcomes. It is reasonable to assume, in such cases, that the legislation in question will be amended sooner or later: the usual practice is to assume the maintenance of current policies or, in the absence of clear policy principles, to assume that current (relative) service levels remain unchanged over the projection horizon.<sup>1</sup>

In our analysis, we applied the following guidelines when determining constant economic and fiscal policies:

- As long as current regulations provide a plausible guidance on the future development of a budget item, we considered them as our starting point.
- Beyond the applicability of current rules, we assumed that current service levels are maintained in relative terms.
- For most items, the maintenance of current service levels is understood, in line with international practice, as a constant level in proportion to potential GDP.
- Budget items affected by demographic trends are exceptions: the effects of demographic change have been incorporated in their case.
- For some expenditure items (government investments, wages in healthcare), the maintenance of the current service levels at their current low levels would generate tensions in the medium term and would inevitably lead to additional expenditures in the future. In such cases, instead of current outlays we considered historic average relative expenditures as indicators of the cost of maintaining trend service levels and indexed this to potential GDP.

Generally speaking, for the purpose of projecting fiscal balances for the 2012–2016 period (Chapter 3), existing laws and measures cover the development of most of the budget items, and thus in most cases, the prevailing laws were taken as a starting point. For the purpose of the projection of debt for the 2017–2026 period (Chapter 4), current

legislation provided no guidance in most cases, and consequently we assumed the maintenance of the service level for most items.

## 1.5. METHODOLOGY OF THE PROJECTION OF PUBLIC DEBT INDICATORS

The medium-term projection of public debt requires the following main building blocks:

1. A few fundamental macroeconomic indicators (GDP, inflation, consumption, etc.) as well as demographic trends need to be projected;
2. In line with these and the principles set out in the previous section, the course of development of the (primary) fiscal balance net of interest expenditures must be outlined;
3. Starting from the present level of debt, the outlook on the future development of the debt ratio can be prepared using the *primary balance*, *interest expenditures*, the *exchange rate* and *GDP growth*.

Ideally, the methodology outlined is iterative, that is, it takes into account the key interactions between macroeconomic, financial and fiscal processes.

For the determination of the course of macroeconomic variables we started from the current situation and the 2-year outlook presented in the *Quarterly Report on Inflation* published by the MNB in March 2012. In respect of the 2012–2016 period, we assume that the cyclical position of the economy will have closed by the end of these years. From 2016 onwards, macroeconomic processes will develop along the medium-term trends. The rate of economic growth is identical to the potential growth rate while the inflation rate is the same as the 3 per cent inflation target of the MNB. The short-term and medium-term macroeconomic assumptions are detailed in Sections 3.1 and 4.1.

Our projection of the budget revenues and expenditures and the resulting primary balance were prepared based on the macroeconomic assumptions thus obtained and the principles and methodology described in Section 1.4.

<sup>1</sup> For example, several of the revenue and expenditure items of the general government are set in nominal terms in the applicable laws. In such cases, nominally fixed values on a 15-year horizon would gradually erode revenue or expenditure levels and should generally not be regarded to represent constant policy. Most of the time, nominally fixed values merely indicate that the legislator wishes to keep his options open as to the timing of implementing policy objectives within the constraints of the budget. If these nominally unchanged figures were incorporated into the long-term projection, the outcome would represent a deterioration of the standards of service, i.e. it would mean a relative change in policy.

The course of interest expenditures used for the debt trajectory is determined mostly by our assumptions on the country-specific risk premium. With respect to the risk premium we assumed that on the projection horizon the sovereign risk premium will decline relatively quickly and substantially, but that it will not return to the pre-crisis levels characterised by a consistently low-yield financing environment. Our assumptions for funding costs are detailed in Section 4.4.

The modelling framework applied is unable to take full account of the simultaneous interactions of the macroeconomic assumptions, fiscal policy and financial processes. Wherever it was necessary, we used expert judgement to assure that the baseline scenario is consistent and the projection reflects the main interactions of the variables incorporated.

## 1.6 STRUCTURE OF THE ANALYSIS

In *Chapter 2* we describe the factors that contributed to the accumulation of current public debt levels, address interest on the public debt separately, and then go on to look at the rate of indebtedness in international comparison.

In *Chapter 3*, as the first step towards our long term debt projection, we present our medium-term (2012–2016)

projection for the budget deficit and general government's position. In addition to presenting the effects of past measures and those setting the course for future fiscal developments, we also aim to capture, as accurately as possible, the "starting" fiscal position after the close of the present economic cycle and use it as the basis for the longer-term debt projection.

*Chapter 4* presents the results of the debt projections assuming a constant fiscal policy, the analysis of the estimated sensitivity of the debt level to selected key variables as well as the additional adjustments necessary to meet the debt targets fiscal gap.

*The Appendices* contain a number of methodological notes to supplement the projection and to substantiate the results. We present some alternative fiscal indicators other than gross public debt that capture the position of the government more comprehensively. Then we present our assumption concerning demographics and the labour market and analyse, in detail, the factors affecting the development of public expenditures on healthcare. Finally, we present the key methodological assumptions underlying the projection in a tabular form.

## 2 The initial debt level

Capturing the government's financial commitments, a heritage of past fiscal policy, through economic indicators is far from easy. International institutions and investors ascribe great importance to gross public debt, which embodies the financial obligations of the general government accumulated in the past. The indicator has the advantage of being more or less exact and easy to quantify; consequently it is available for a number of countries. However, it has the disadvantage of covering only some of the present effects of past budget decisions.

The total future effect of past fiscal decisions can be better grasped through the aggregate balance sheet of the general government containing not only financial assets and liabilities, but also tangible assets. In addition, liabilities relating to past activities but materialising in the future are also part of the heritage of fiscal policy.

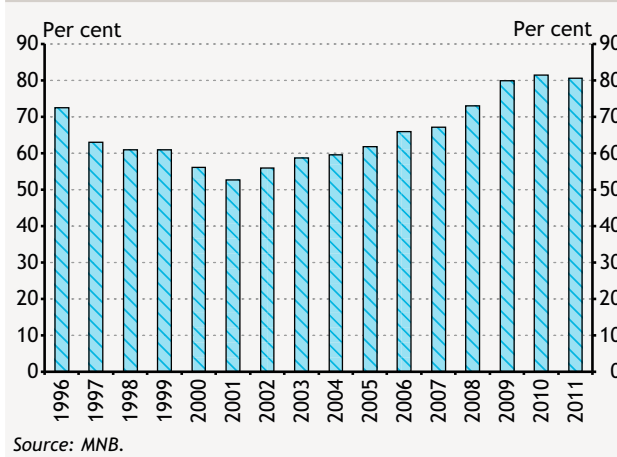
In keeping with convention, we focus on gross public debt in our analysis. However, in the Appendix (Appendix 6.1) we attempt to present alternative fiscal indicators that may become increasingly important in the future in evaluating the "fiscal status" of a country.

In the following, we describe the factors that contributed to the evolution of the public debt ratio in excess of 80 per cent of GDP prevailing at end-2011, address the interest burden on the public debt separately; we then go on to look at the rate of indebtedness in international comparison.

### 2.1 PRESENT LEVEL OF PUBLIC DEBT OF HUNGARY AND THE MAIN DRIVERS OF ITS PAST DEVELOPMENT

The development of the gross public debt is determined primarily by the combined effects of four drivers: the primary balance, real interest payable on existing debt, the real exchange rate and GDP growth. It should be noted, however, that over and above these factors, in certain cases changes in debt may occur independent of the budget balance.

**Figure 4**  
Gross public debt as a percentage of GDP



Since consistent data became available, there have been three major periods in the history of public debt of Hungary (Figure 4 and Figure 5):<sup>2</sup>

- The very high level of the mid-1990s was followed by a gradual decline until 2001 as a result of accelerating economic growth, tighter fiscal policy and, to a large extent, the use of privatisation proceeds towards debt reduction. As a combined result, from the approximately 90 per cent peak in the first half of the 1990s gross public debt fell to 52.7 of GDP by 2001.
- After 2001 the debt ratio started rising, mostly due to the substantial deterioration of the primary balance between 2002 and 2006, but the relatively high real interest burden also played a part. In contrast, the average 4 per cent economic growth and, to a lesser extent, the appreciation of the real exchange rate attenuated debt growth; still, the debt ratio rose to 65.9 per cent of GDP by 2006.
- In 2006 it became clear that the high primary deficit could not be sustained even in the short term, and thus substantial fiscal adjustments were implemented in

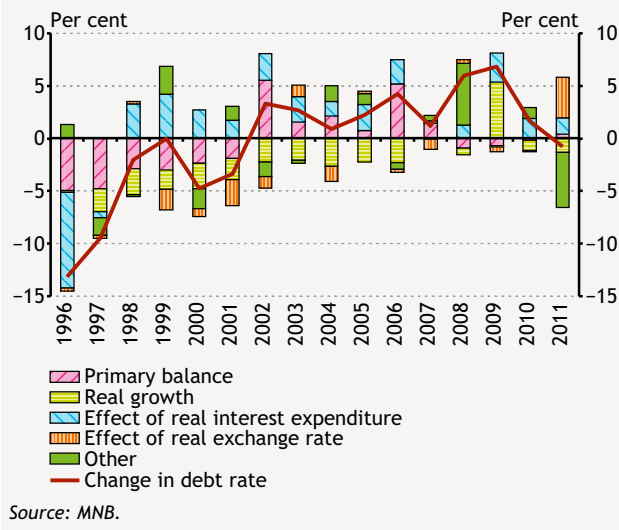
<sup>2</sup> The development of the public debt of Hungary is analysed in detail by Czeti and Hoffmann (2006).

several steps. As a result of these adjustment, the budget showed a surplus already in 2008. Simultaneously, however, GDP growth was replaced by stagnation, and then, in the wake of the international financial crisis, a recession. Furthermore, the real appreciation of the forint came to a halt and in 2011 a significant depreciation increased the value of foreign currency debt as a percentage of GDP. Between 2006 and 2011, the debt ratio rose by 15 percentage points; the primary balance and net interest expenditures played a reduced role in this development, its main causes being the economic downturn and the depreciation of the currency.

same time 90 per cent of the portfolio managed by private pension funds was transferred to the Pension Reform and Debt Reduction Fund. Approximately half of the acquired portfolio consisted of government securities, which the debt management agency withdrew; thus the public debt was reduced by 4.9 per cent of GDP in one move. Another part of the acquired portfolio was sold by the Fund, thus the resulting revenue also contributed to reducing the debt ratio.

At the end of 2011, the debt ratio was 80.6 per cent of GDP, exceeding by far the debt rules applicable to Hungary: the 60 per cent ceiling set in the Maastricht Treaty as a precondition for joining the Economic and Monetary Union and the 50 per cent level enshrined in the Constitution effective as of 2012.

**Figure 5**  
Decomposition of the development of gross public debt as a percentage of GDP



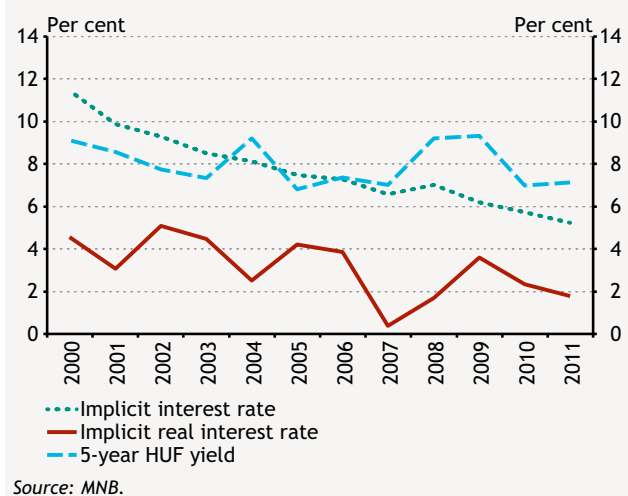
## 2.2 INTEREST EXPENDITURE ON PUBLIC DEBT

The interest burden, which is a major driver of public debt growth, has shown a declining trend in the past decade: the implicit nominal interest rate fell by some 6 percentage points between 2000 and 2011.<sup>3</sup> The change resulted from a number of factors, notably the lower inflationary environment as well as the persistently high risk appetite prevailing in international capital markets up till 2008 and the resulting low global yield environment. To show the importance of lowered inflation, real yields declined by less than 3 percentage points in that period (Figure 6).

In addition to the primary cash balance of the budget, nominal debt was affected during the period by several one-off factors unrelated to the cash deficit. In recent years the most significant factors were the loans drawn down from the IMF/EU credit facility in 2008 and the cancellation of the government securities transferred from the private pension funds to the government in 2011.

- In 2008, the Hungarian government took out a loan exceeding its financing requirement at the time, which added 5.5 per cent of GDP to the debt in that year. Some of the loan was on-lent to the Hungarian banking sector or deposited at the central bank, and later part of it was used towards purchasing securities (MOL share package).
- In 2011, 97 per cent of private pension fund members moved back to the pay-as-you-go pension pillar and at the

**Figure 6**  
Implicit interest rate of public debt



<sup>3</sup> The quotient of the interest payable in a given year and the debt outstanding at the end of previous year is called implicit interest rate, which in effect shows the average interest rate paid on the total debt stock.

After the onset of the global financial crisis in the autumn of 2008, the risk premium required by investors as well as interest rates rose sharply, but despite this the implicit interest rate of Hungarian public debt continued falling. This is mostly attributable to the use of the IMF–EU credit facility, because the interest rate on the funds made available by the international organisations was one half to one third of the interest rate of Hungarian government securities issued in the same period. The credit allowed the Hungarian

government to issue relatively few bonds at end-2008 and in the first half of 2009, when yields were highest in the government securities markets, and to return to the financial markets only after yields had declined again. Thus, the decline in the implicit interest rate continued despite the end of the downward trend, and then reversal, of market yields. Meanwhile, the structure of debt was also rearranged: HUF-denominated funding from the market was supplemented by foreign currency loans from international organisations.

### Box 1

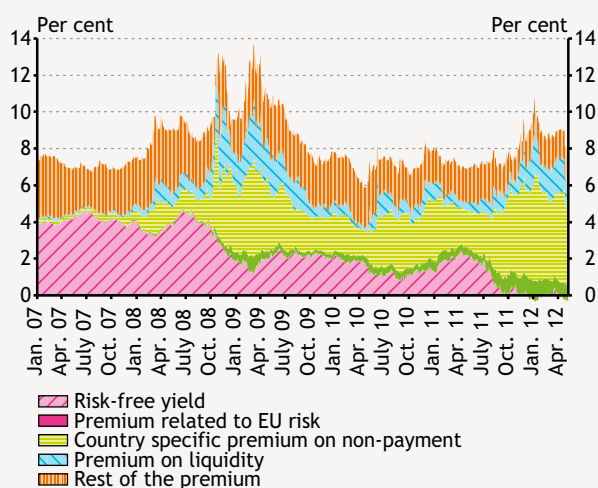
#### Changes in the factors affecting the cost of market financing in the wake of the crisis

Yields on the government securities market, which sky-rocketed at the start of the financial crisis, have now returned to the pre-crisis levels. However, as a result of the changed environment and increasing risk sensitivity, there are different factors underlying the similar yield levels: the risk premium has risen significantly, which is offset by the fall in risk-free yields to a level close to zero.

In respect of 5-year government bonds, Monostori (2012) demonstrated that early in 2008, immediately before the crisis, half of the required yield was attributable to the yield of risk-free assets available as alternatives, and this was increased by the foreign exchange and interest rate risk premia (Figure 7). However, the financial and sovereign debt crises reshaped investors' risk perception in terms of the sustainability of fiscal policies, and thus at the end of 2011 and early in 2012 the component relating to the probability of default was responsible for half of the yield of Hungarian government securities. Still, nominal interest rates failed to rise substantially compared to the early 2008 levels, as risk-free yields fell to almost zero in developed countries, thus a larger risk premium was added to a lower basis.

The significance of sovereign default risk has been on the rise around the world since the onset of the crisis. Before the crisis, the vulnerability of the various countries was barely reflected in the CDS spreads, whereas today – in addition to the rise in the absolute levels – the variance of spreads has also increased as country-specific factors have been given more weight. Kocsis and Nagy (2011) found that in respect of longer-term developments, the rising default risk for Hungary is attributable to a lesser extent to the deterioration of the country's relative position or perception, while the global and regional increase of the spreads required from high-risk countries and assets played a greater part. In the past year, however, along with the rise in the Hungarian spread attributable primarily to global causes, the importance of country-specific factors has increased.

**Figure 7**  
Decomposition of the five-year HUF government securities yields



Source: ÁKK, MNB.

## 2.3 PUBLIC DEBT OF HUNGARY IN INTERNATIONAL COMPARISON

A high level of public debt affects the economy of a country through a number of channels. First and foremost, the interest paid on the debt is a burden on the budget, while the interest paid to non-residents worsens the balance of payments of the country. High interest expenditure presents a significant constraint on fiscal policy.

The high debt level makes the country more risky for investors, which pushes up the yields required from the public and private sectors alike. The high financing requirement of the government may divert funds from the investments of the private sector.

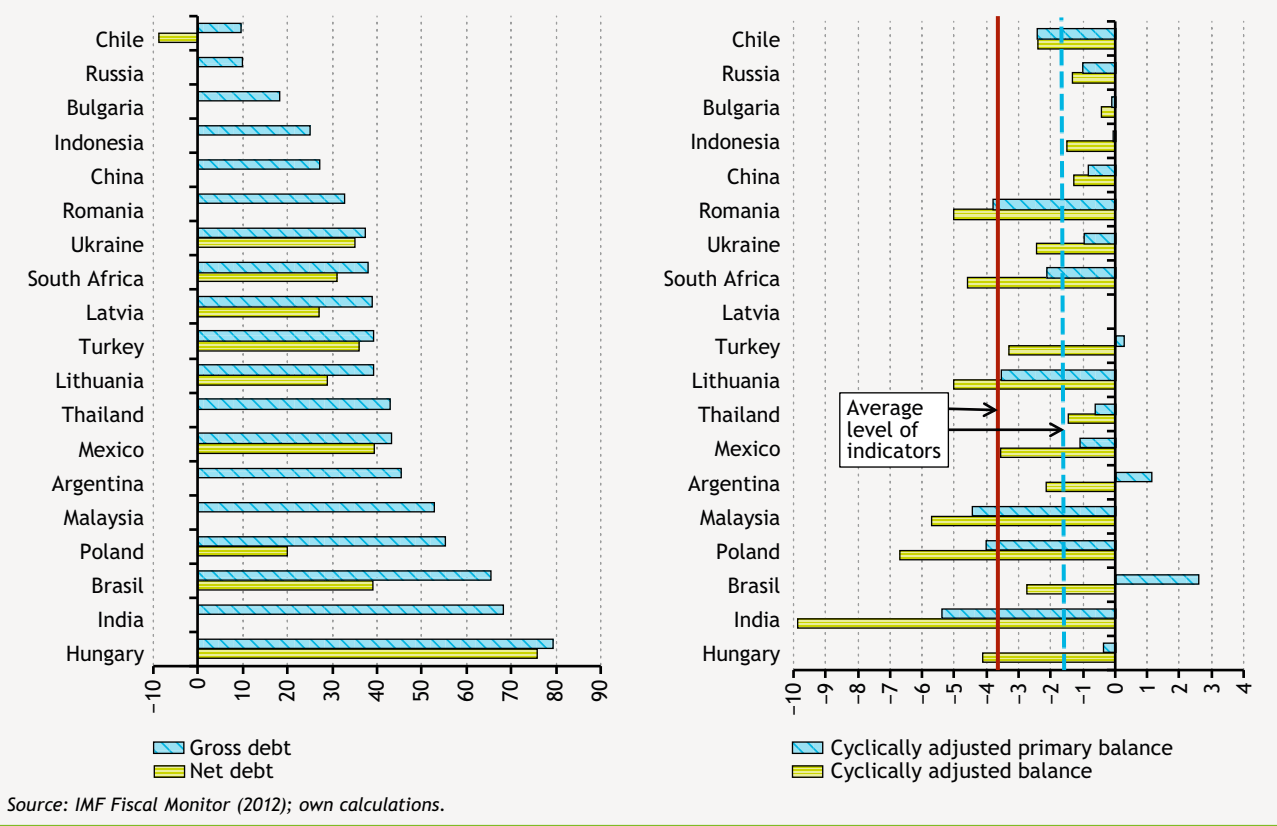
There is no consensus in the literature on the optimal level of debt, and the threshold above which the negative effects of the debt ratio become tangible is also a point of



**Figure 8**

**Gross and net public debt of emerging economies and their cyclically adjusted primary and total fiscal balance**

(% of GDP, average of 2009–2011)



Source: IMF Fiscal Monitor (2012); own calculations.

contention. In addition to the level of debt, its structure and the economic prospects of the country are also important in the assessment of the effects of the debt ratio. However, the role of public debt in the assessment of the risk of a country has clearly increased in the wake of the European sovereign debt crisis, and rising yields have raised the interest expenditures of indebted countries even further.

The gross and net public debt of Hungary as a percentage of GDP is strikingly high in international comparison. Even though the budget deficit indicators adjusted for the effects of the economic cycle have shown a favourable trend in international comparison in recent years due to the series of fiscal adjustments which started in 2006, the average 80 per cent gross and approximately 78 per cent net debt ratio observed in the 2009–2011 period is still significantly higher than the corresponding figures for emerging economies.<sup>4</sup>

The effect of the high debt level is reflected in the deficit indicators: while the primary budget deficit adjusted for cyclical effects and excluding net interest expenditures has been substantially more favourable in recent years than the average of emerging economies, the deficit including interest payments slightly exceeded the level typical for this country group (Figure 8).

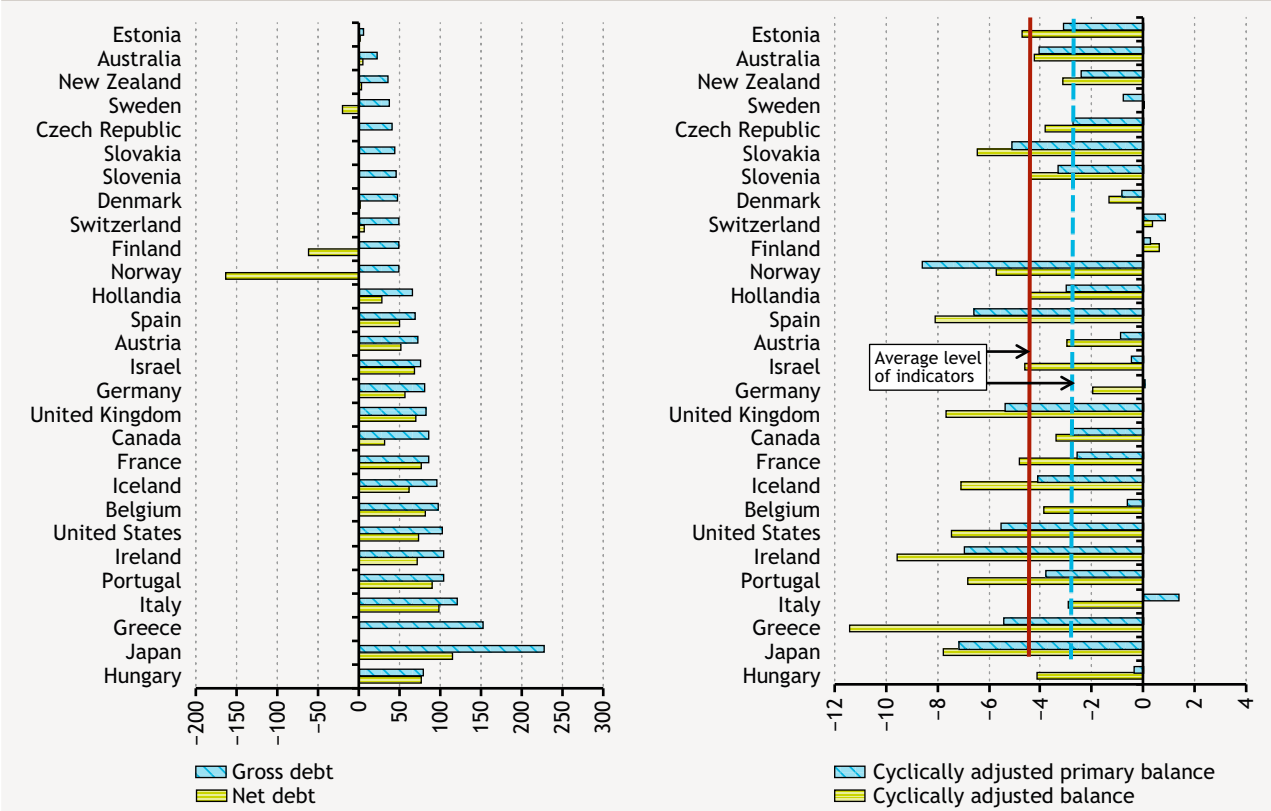
The gross and net indebtedness of Hungary is not an outlier among developed countries, but most of those countries face lower financing costs despite their high levels of debt (Figure 9). As a result, the net interest expenditure reflected in their deficit is below the level typically faced by emerging economies, even if their debt ratio is higher. One of the reasons for the lower funding costs is investors' perception that a debt of a given magnitude represents a relatively smaller sustainability risk in more developed economies. Higher income-generating capacity provides a more secure cover for future repayment.<sup>5</sup>

<sup>4</sup> The net debt ratio excluding the liquid financial assets of the general government shows an even more striking difference, as a number of emerging countries have substantial volumes of liquid assets to counterbalance the gross debt. Such liquid assets include, in addition to financing reserves accumulated, the government's foreign currency deposits serving as foreign exchange reserves, the reserves in the pension system or financial assets set aside from revenues from oil or other commodities.

<sup>5</sup> The key findings in literature on the optimal level of public debt and the different debt limits of developed versus emerging countries are summarised in Box 3.2. of the MNB publication "Analysis of the Convergence Process, 2011".

**Figure 9**  
**Gross and net public debt of developed countries and Hungary and their cyclically adjusted primary and total fiscal balance**

(% of GDP, average of 2009–2011)



Source: IMF Fiscal Monitor (2012); own calculations.

Because of the different risk perception of market actors and the resulting variations in funding costs, the debt levels of countries at different levels of development cannot be compared directly. An examination of Hungary’s indebtedness in terms of per capita GDP at purchasing power parity as an indicator of the level of development also leads us to conclude that the country’s indebtedness is exceptionally high compared to the level of development (Figure 10). The debt ratio appropriate for the level of development may be around 40-50 per cent based on 2010 figures.

Public debt is high not only compared to the level of development but also as a percentage of the net financial assets of Hungarian households (Figure 10). In many developed countries, including Belgium, Japan and Italy, the high public debt as a percentage of GDP is financed predominantly by domestic savings. In Hungary, during the

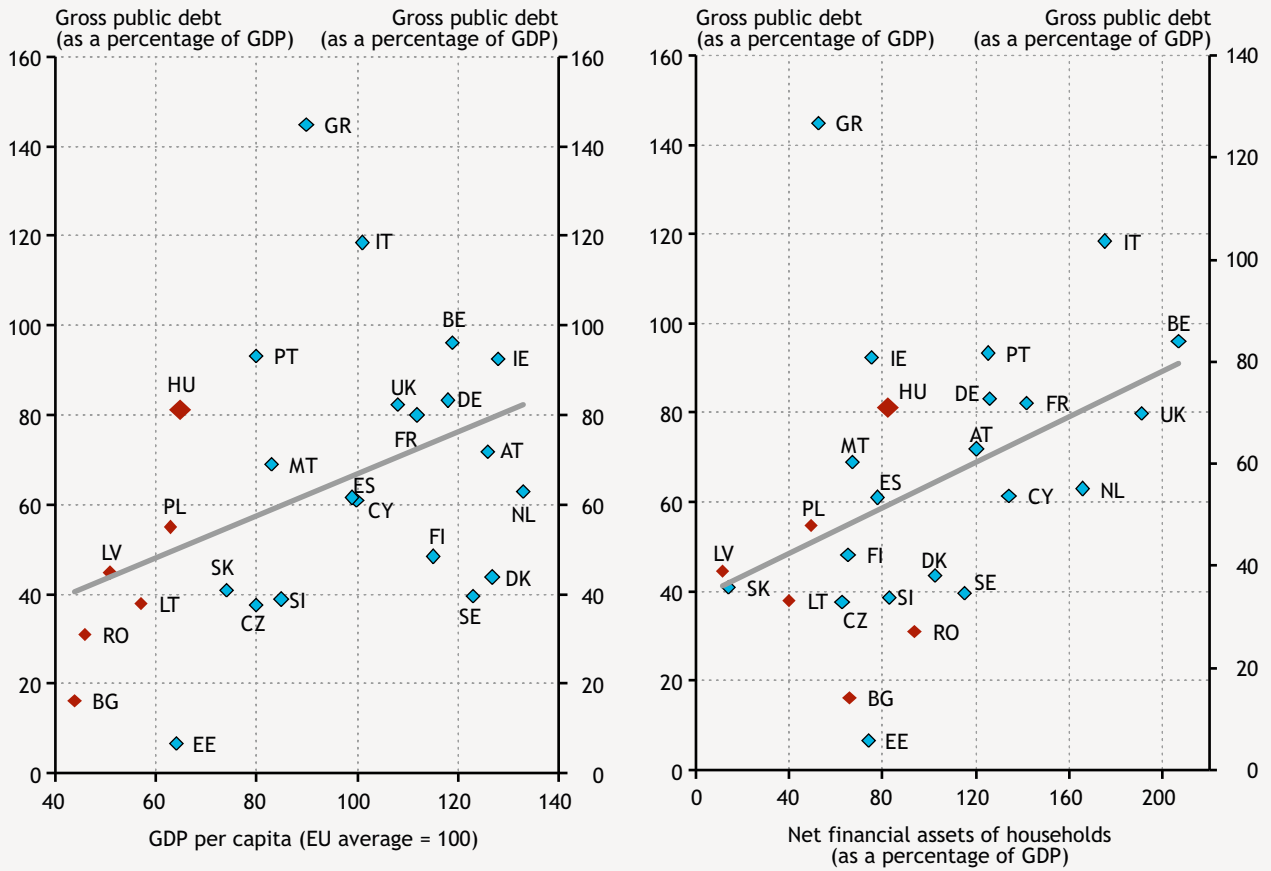
period of consistently loose fiscal policy, household savings were far from covering the budget deficit. Consequently, the growth in public debt was accompanied by growth in the external financing requirement and a rise in external debt and liability indicators. The significant external and internal indebtedness led to a steady rise in financing risks and in the premium required on investments in Hungary.

A similar conclusion emerges from the so-called DEWIL index (Debt-Wage Index of Liberty), which shows the number of months of gross average wages at purchasing-power parity corresponding to the gross public debt per employed person at PPP. This indicator takes into account per capita GDP as well as differences in wage levels and participation rates, casting a different light on the Hungarian public debt. According to this indicator between 2000 and 2010 the position of Hungary worsened by almost five months.<sup>6</sup>

<sup>6</sup> We are indebted to Dávid Szebeni (Budapesti Corvinus Egyetem, Economic Policy Department) for the guidance he provided in the production of the DEWIL index.

**Figure 10**  
Gross public debt as a function of development level and household financial assets

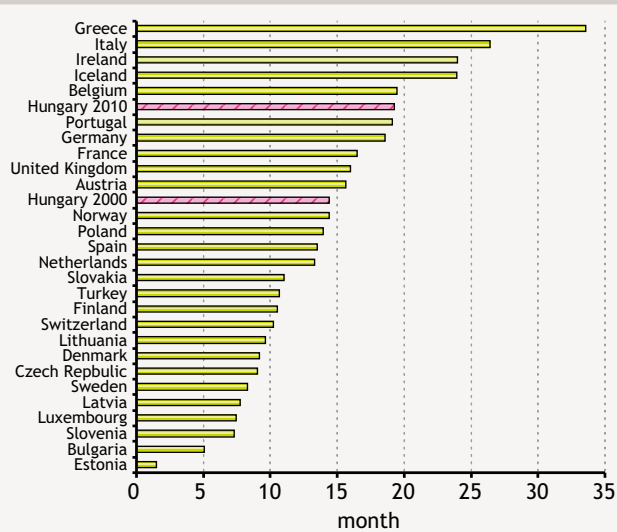
(end-2010 figures, per cent)



Note: Red dots denote emerging economies, blue dots developed countries. We classified countries as emerging/developed in accordance with the categories of the IMF Fiscal Monitor (2012).

Source: Eurostat.

**Figure 11**  
DEWIL index



Source: IMF-VB, OECD.

# 3 Medium-term position of the general government (2012–2016)

As the first step towards our long-term debt trend analysis, we present our medium-term projection (2012–2016) for the budget deficit. In addition to presenting the effects of past measures as well as measures setting the course for future fiscal developments, we also aim to capture, as accurately as possible, the “starting” fiscal position after the end of the present economic cycle that serves as the basis for the longer-term debt projection.

We considered it important to elaborate this period in more detail and analyse it separately, because most of the fiscal measures adopted in the past exert the bulk of their budgetary effect over this horizon. The majority of these fiscal impulses, with the exception of the Structural Reform Programme 2.0, are also taken into account in the

macroeconomic trajectory used. The effects of the overwhelming majority of the measures are fully incorporated in the debt trajectory in this time frame.

In the following, we first describe the development of current revenues and expenditures. We then go on to explain our assumptions relating to investments, EU transfers and the incorporation of the debt and profits of companies performing quasi-fiscal functions, and finally we discuss the resulting course of the general government balance.

The projection methodology applied to the various budget revenue and expenditure items is presented in detail in Appendix 6.5.

## Box 2

### How were the impacts of the Structural Reform Programme 2.0 taken into account in our projection?

The Structural Reform Programme 2.0 announced on 23 April 2012 substantially changes the medium-term and long-term fiscal path. This package of measures was announced after the deadline for defining our cyclical macroeconomic trajectory for 2012–2016, which forms the basis of our projection. Therefore, we applied a “hybrid” solution for the incorporation of the measures of the Structural Reform Programme 2.0, in the following manner.

In order to quantify the fiscal balance, we took into account the direct and indirect (net) fiscal effects of the programme over the projection horizon. In order to capture the effects more accurately, we estimated the direct tax revenue reducing effects of the measures as well as the extent the government measures may cut into corporate profits, resulting in foregone corporate profit tax revenues.

By contrast, we were not in a position to take into account the effects of the Structural Reform Programme 2.0 in quantifying the macroeconomic path for the 2012–2016 period. For instance, the consequences of the deceleration of growth due to demand contraction or the expected higher inflation path are not taken into consideration.

However, the absence of the incorporation of macroeconomic consequences is not expected to have a significant effect on the development of debt in the long term. This is because the measures may have counteracting effects on the main drivers of the changes in the debt ratio, practically cancelling each other out.

### 3.1 MACROECONOMIC ASSUMPTIONS<sup>7</sup>

In the first period up to 2016, the growth path is determined by the gradual rise in the potential growth rate and narrowing of the output gap. According to our current estimate, in early 2012 output may be nearly 2.5 per cent lower than its potential level. The capacity utilisation of factors of production may increase gradually until 2016, supported by the gradual recovery of the global economy and the slow pick-up in domestic demand. Thus, by 2016 the recovery of demand may provide a slight boost to the economy. In the coming years, however, the productive capacity of the economy will expand at a very slow pace, and thus a growth rate of around 2 per cent is to be expected.

On the time horizon of a few years, the European debt crisis and the low international risk tolerance will be coupled with slow expansion in our export markets and a massive shortage of funds. This will force Hungarian economic actors to continue adjusting their balance sheets. The investment rate in the private sector may remain persistently low, as the capacities of companies adapt to lower growth prospects than before the crisis. In addition, the low capacity and willingness to lend of the banking system may also restrain investment. In such an environment, the increase of labour demand from businesses may only be gradual; consequently, the favourable employment effect of economic policy measures to expand the labour supply may materialise very slowly. Households will adapt to their deteriorating income prospects by downscaling their equilibrium debt levels, which may result in a high saving rate for a prolonged period. Furthermore, the precautionary savings motives may also remain strong in the uncertain economic environment. As a combined result, household consumption as a percentage of GDP may remain persistently low.

Exports may continue to be the main driver of growth until 2016. Even though import demand from the euro area, our

main export market, may expand moderately in the wake of the fiscal adjustments, it is possible that Hungarian exporters will also profit from the robust growth in the emerging markets. Furthermore, the new capacities in the automotive industry to be commissioned from 2012 on may also provide a temporary growth surplus to exports. Until 2016, the structure of growth may become more and more balanced as domestic demand starts recovering.

We assume that the output gap will have closed by 2016 and that thereafter the level of actual and potential output will be identical. At the same time, inflation will develop in line with the central bank's medium-term target: as a technical assumption, we carried the present 3 per cent target through to 2026.

### 3.2 FACTORS AFFECTING THE BUDGET BALANCE

Between 2012 and 2016 a number of measures adopted earlier or introduced under the Structural Reform Programme 2.0 will affect the ratio of main primary revenues and expenditures to GDP, contributing to the evolution of the primary balance and the general government deficit. As our assumptions concerning EU transfers and investment trends are particularly important for determining the budget balance, we treat these issues as priorities.

#### 3.2.1 Main budget revenues

In the category of *consumption taxes*, VAT revenues will amount to around 9.2 per cent of GDP in 2012. Assuming constant effective tax rates, the tax burden may increase by 0.2 percentage points by 2016. The difference results from the phase-out of the simplified entrepreneurial tax because the number of taxpayers subject to VAT will increase on the one hand and, on the other hand, a slight whitening is also expected as a secondary effect. Based on the rules we applied in the baseline projection, in the short term we expect no further change in effectivity, i.e. the

**Table 1**  
Key assumptions of the baseline scenario, 2012–2016

(per cent of GDP)

	2012	2013	2014	2015	2016
Economic growth	0.1	1.5	2.3	2.1	2.1
Inflation	5.6	3.0	2.6	3.0	3.0
Activity rate	56.1	56.7	57.5	58.3	58.9
Unemployment rate	10.5	11.1	11.8	12.0	12.2

<sup>7</sup> For the determination of the course of macroeconomic variables, we started from the 2-year outlook presented in the Quarterly Report on Inflation published by the MNB in March 2012.

“whitening” of the economy still incorporates substantial additional revenue.

We expect revenues from *excise duty* to decline as a percentage of GDP until the end of 2016. Based on our projected path of oil prices in HUF terms, we expect a moderate increase in the excise tax content of fuel. In respect of the excise tax on tobacco products, we took into account compliance with the EU requirements on minimum tax content (these are known up to 2020) and extrapolated the current trends in tobacco consumption. As a result of declining consumption, we project a contraction of GDP-proportionate tax revenues for 2016.

The *personal income tax* burden declined substantially between 2009 and 2011. The raising of the tax bracket, then the introduction and lowering of the flat tax rate, as well as the reinstatement of family taxation were all conducive to reducing the tax burden. Our calculations show that termination of the tax credit and the changed rules of taxation for cafeteria type income will increase the tax burden by 0.4 percentage points of GDP in 2012. In our projection, we assumed that from 2013 on the grossing up of the tax base will be completely abandoned in the higher income brackets as well, and that due to the phase-out of the simplified business tax, some of taxpayers will transfer to the personal income tax regime. As the combined result of these two factors, the GDP-proportionate PIT revenue will decline by some 0.1 percentage point from 2013 on, and the aggregate revenue will level out at around 5 per cent of GDP in any given year.

In terms of *corporate income tax*, most of the growth assumed for 2013–2014 in excess of the potential GDP trend arises from the higher aggregate profitability of companies as a result of the taxes to be eliminated (sector-specific taxes and special tax of financial institutions), temporarily steeper profit growth due to the cyclical effect and the abolishment of the simplified business tax. As companies transfer from the simplified business tax regime to the corporate tax regime, the tax base for the latter may increase gradually. The limitation on the write-off of losses effective from 2012 will contribute to higher tax revenues until 2016, while in the long term its effects will wane as economic associations will spread the accumulated losses across a longer time frame. As an opposite force, tax revenues will be reduced by the effect of sports sponsorship payments being incorporated in the base of payment obligations, by the direct effect of the new taxes in the Convergence Programme and the broadening of the innovation contribution base.

The special tax on *financial institutions* will be phased out for credit institutions as under the agreement between the Government and the Banking Association it is to be replaced by the EU’s financial transaction tax from 2014 on. The rate and base of that tax may not be greater than the levels applied in the EU. The special tax on insurance undertakings will also be lifted in 2014 as it will be incorporated into the single insurance tax. We assume that the government’s income from the EU transaction tax will correspond to some 0.1 per cent of GDP in 2014.<sup>8</sup>

*Sector-specific taxes* will be abolished in 2013. Our calculations show that as a result the deficit in 2013 will increase by some 0.5 per cent of GDP and the total annual impact as a percentage of GDP will be approximately 0.6 per cent from 2014 on.

The *revenue increasing measures specified in the Structural Reform Programme 2.0* affecting payments by businesses – the financial transaction levy, the electronic road toll, the increase of the rate of the income tax of energy companies and the broadening of its base, the telecommunication service tax, the change in the tax on insurance undertakings – will improve the general government balance substantially, by more than 1 per cent of GDP, by 2016. In respect of the transaction levy, the most significant of the planned revenue items, we consider that under the known parameters the budget revenue increase expected by the Government is feasible – we reckon with a slight decline of no more than a few per cent in payment transactions serving as the tax base – and the GDP-proportionate level of the revenue from the transaction tax is sustainable in the longer term. Nevertheless, we see significant risks in the measures listed above. In the case of the electronic road toll, net receipts from the tax may be substantially lower than proposed due to the implementation risk and the expected significant behavioural effect. In the case of the profit tax on energy companies, there are substantial indirect effects that reduce net tax revenues. The expansion of the telecommunication service tax is expected to grow below the rate of nominal GDP growth until 2016 due to the tax base applied.

Payments by economic associations include a large number of so-called *minor taxes* not exceeding 1 per cent of GDP. The tax bases for most of these taxes are projected using nominal potential GDP, and thus their ratio to GDP remains constant over the projection horizon. Mining royalty is an exception, where due to the shrinkage of the oil and natural gas reserves that can be exploited profitably we project a declining linear extraction trend and rising oil prices. In our

<sup>8</sup> In accordance with the proposal of the Commission, the revenues from the transaction tax would be split between Member States and the EU. The revenues retained by the EU would be deducted from the national contributions to the EU budget. Member States may decide to impose a transaction tax with a higher rate or broader tax base than the EU transaction tax (EC, 2011c).

**Table 2**  
General government revenues as a percentage of GDP

	2012	2016	Change
<b>Revenues of central budget</b>	<b>29.4</b>	<b>27.5</b>	<b>-1.8</b>
<b>Consumption related taxes</b>	<b>12.4</b>	<b>12.4</b>	<b>0.0</b>
of which: excise tax	3.1	2.9	-0.1
<b>Payments by households</b>	<b>5.5</b>	<b>5.3</b>	<b>-0.2</b>
of which: Personal income tax	5.2	5.0	-0.2
<b>Payments by economic organizations</b>	<b>4.0</b>	<b>3.7</b>	<b>-0.3</b>
Revenue appropriations in Széll Kálmán Plan 2.0*	0.1	1.0	1.0
Special tax on financial institutions**	0.2	0.2	0.1
Sector-specific taxes	0.6	0.0	-0.6
Corporate income tax	1.1	1.1	0.0
Simplified entrepreneurial tax	0.5	0.0	-0.5
<b>Gross revenue of budgetary chapters and units***</b>	<b>7.0</b>	<b>5.8</b>	<b>-1.2</b>
<b>Other revenues and corrections</b>	<b>0.5</b>	<b>0.3</b>	<b>-0.2</b>
<b>Revenues of Social security funds and Extrabudgetary funds</b>	<b>13.4</b>	<b>13.9</b>	<b>0.5</b>
Social contributions and related taxes****	12.7	13.4	0.6
Other revenues	0.6	0.5	-0.1
<b>Consolidated revenues of local governments</b>	<b>5.9</b>	<b>5.0</b>	<b>-0.9</b>
<b>Interest revenue</b>	<b>0.3</b>	<b>0.2</b>	<b>-0.1</b>
<b>Total primary revenues</b>	<b>49.0</b>	<b>46.7</b>	<b>-2.3</b>
Memo:			
ESA correction in the primary balance	0.1	-0.1	-0.2

\* The electronic road toll recorded in net terms.

\*\* In 2012 the tax receipts from the special tax on financial institutions can be lowered by the amount of losses on the early repayment of FX denominated loans.

\*\* In 2016 together with the EU transaction tax.

\*\*\* The drop reflects primarily the decline in EU transfers (see the section on EU funds for more details).

\*\*\*\* In 2016 without the accident tax.

projection, the company car tax, energy tax and environmental product fee increase at a rate below nominal GDP growth until 2016, as we assume that these flat rate taxes will not be indexed until 2016. Accordingly, by 2016 payments by economic associations will increase only slightly as a percentage of GDP above the year 2012 level after the measures proposed in the Structural Reform Programme 2.0.

In respect of the *contribution revenues of social security and extrabudgetary funds*, since 2010, as a result of the contribution rate hikes and broadening of the contribution

base, the effectivity<sup>9</sup> of *contribution payment* has been decreasing slightly but steadily, a process aggravated by the crisis.<sup>10</sup> The effectivity of contribution payment is likely to fall even further due to the preferential schemes introduced in 2012: these include the transitory wage compensation and the Karrier-Híd (Career-Bridge) program in 2012–2013 as well as the recently introduced contribution allowance for unskilled workers. In our projection, we have incorporated the contribution base broadening measures<sup>11</sup> effective from 1 January 2012,<sup>12</sup> while the level of the contribution ceiling<sup>13</sup> is carried forward at the rate of wage inflation.

<sup>9</sup> The contribution revenue to be calculated from the adjusted wage bill estimate divided by the contribution revenues observed.

<sup>10</sup> In our projection, we have taken account of the additional revenue receipts from the assumed wage increase in the public sector (education, healthcare) as well as a significant rise in healthcare contribution revenues pursuant to the measures implemented in 2012, which contribute significantly to raising the revenue levels as a per cent of GDP.

<sup>11</sup> A formal change occurred in the distribution of contribution revenues as of 1 January 2012. The employer contributions (pension insurance, healthcare and labour market contributions) are collected under the name of social contribution tax, which is allocated to the various general government funds in a proportion set out in law.

<sup>12</sup> The minimum social contribution tax payable by sole proprietors and economic associations is 112.5 per cent of the minimum wage, and in respect of the health insurance and labour market contributions, 150 per cent of the minimum wage.

<sup>13</sup> The employees' pension and health care contributions are not payable above a certain level of annual income (contribution ceiling).

The substantial drop in the *revenues of local governments* results partly from the assumed reduction of EU transfers and partly from the reallocation of responsibilities to the central government subsystem. As a result of this reallocation, the expenditures of local governments have fallen significantly, thus we expect no substantial change in the balance of the local government subsystem, despite the drop in transfers from the central budget.

### 3.2.1.1 Assumptions concerning EU funds

Funds from the European Union are of extraordinary importance for the projection for two reasons: their effect on the macroeconomic developments and on the fiscal balance.

Total EU transfers received at the level of the national economy, and in particular the composition of funds financing current expenditures versus investments plays a major role in shaping the macroeconomic path. The effect on the fiscal balance is determined by the share of the central government within the national economy level receipts and, within that, the ratio of current and capital transfers.

In respect of funds to cover current expenditures, we assume that such expenditures would not have been incurred in the absence of those funds. Thus, their increase or decrease has no impact on the balance, while they do have macroeconomic effects as additional sources of funding. In contrast, in the case of funds for investment purposes we assume that investments will develop independently of EU funding in the medium term (See Chapter 3.2.2.1). In respect of the extrapolation of EU funds we looked at two issues.

On the one hand, we estimated the use of funds relating to the 2007–2013 financial framework up to 2016, including the share of transfers to the government in particular. We assumed dynamic growth, but not total use of the available commitment appropriations.

On the other hand, the level of EU funding in the next multiannual financial framework is an open question. In this context, we started from the public Commission proposal that the restructured Cohesion Fund sources representing the largest portion of the EU commitment appropriations in the 2014–2020 period will be capped at 2.5 per cent of GNI, while agricultural subsidies, representing the second largest item, will stabilise slightly below the current level without falling below the average of the previous financial period

(EC, 2011b). The weight of other funds subject to tendering is moderate in the EU as well; for Hungary, we assume it to be around 0.2 per cent of GNI on average across the years. On the whole, these funds may amount to 4 per cent of GNI, which is slightly more than 3.8 per cent of GDP.

As mentioned before, in terms of the impact on the balance it is the size of funds used by the government sector that matters. Within non-agriculture funds, we assume the average breakdown of current and capital transfers to be constant in the period ahead. Within capital expenditures, however, the maintenance of the constant public/private ratio would have meant the loss of government funds corresponding to 0.1 per cent of GDP as an annual average, thus we assumed reallocation to occur for the benefit of the government. Thus, technically, average capital transfers financing government investments as a percentage of GDP remain constant up to 2026.

### 3.2.2 Key budget expenditures

The development of expenditures related to central budgetary institutions and *chapter administered appropriations* is significantly affected by the measures of the new Act on Public Education. The Act on Public Education contains twelve distinct measures, with the introduction of the career path model for teachers having the greatest impact on future expenditures. The effects of the measures are reflected in expenditures in a staggered manner and extended over time. In 2016, the first year in which the career path model related measure will exert its full influence, the gross expenditures will be 0.8 percentage point of GDP higher than in the constant scenario.<sup>14</sup> Based on the conditions listed and the demographic trends, by 2021, the date of completion of the public education reform, gross wage costs will increase the payroll expenditures of the general government by 0.9 percentage point of GDP. The expenditure growth net of the taxes payable by employers and employees will add 0.5 percentage point of GDP to the consolidated general government expenditure levels from 2021 on.

The first step of the reform starting in 2012 is the relocation of local governments' public education institutions to the central government subsystem. For the purposes of our calculations, we assumed that the change would increase the expenditures of the central government subsystem by 0.2 percentage point of GDP over and above the normative subsidies, but this will be neutralised at the general government level by the regulation of the funding of the entire local government subsystem.

<sup>14</sup> Disregarding the effect of the course of the reclassifications of teachers over time, which will result in savings in the current year.



**Table 3**  
General government expenditures as a percentage of GDP

	2012	2016	Change
<b>Expenditures of central budget</b>	<b>22.0</b>	<b>21.6</b>	<b>-0.3</b>
Budgetary chapters and units	14.8	15.2	0.3
of which: wage bill	4.9	5.2	0.3
Subsidies to economic organizations	1.0	1.1	0.1
Consumer price subsidy and housing subsidies	0.8	0.7	-0.1
Social transfers and assistance	2.9	2.5	-0.5
Contribution to EU budget	1.0	0.9	-0.1
Other expenditures	1.4	1.3	-0.1
<b>Social security expenditures</b>	<b>14.9</b>	<b>14.0</b>	<b>-0.9</b>
Pensions-type expenditures	9.9	8.9	-1.0
Cash benefits and health-care expenditures	5.0	5.1	0.1
<b>Expenditures of Extrabudgetary funds</b>	<b>1.3</b>	<b>1.3</b>	<b>0.0</b>
<b>Expenditures of local governments</b>	<b>9.5</b>	<b>8.3</b>	<b>-1.2</b>
<b>Total primary expenditures</b>	<b>47.7</b>	<b>45.3</b>	<b>-2.4</b>

Other changes in the public education system, apart from the career path model and the demographic trends, jointly have a nearly neutral effect on the future development of wage costs, while the introduction of all-day schooling under tighter terms than we assumed may trigger greater wage expenditure growth than we projected. According to our calculations, the change in the purchase of goods and services will increase expenditures by 0.1 percentage point of GDP.

On the whole, implementation of the public education act without investment expenditures will increase gross expenditures as a percentage of GDP by 1.0 percentage point at the level of the general government once the system is completed, while it will add 0.4 percentage point to gross revenues; thus in the first round, it will worsen the medium-term general government balance by 0.6 percentage point of GDP.

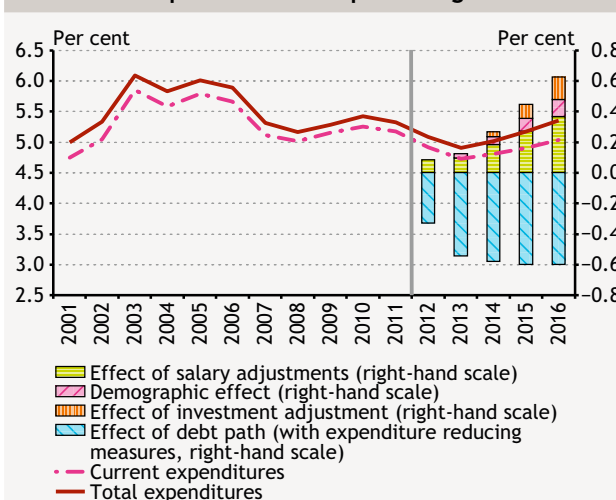
The Act on Higher Education adopted in 2011 mentions that the present system of remuneration of higher education employees will also be replaced by a remuneration system similar to the one set out in the Public Education Act. We have not quantified the effects of this in our projection, partly due to the absence of detailed information and partly because of the ongoing reform of the financing of higher education and the resulting uncertainties.

As a result of the reallocation of retirement benefits among chapters, from 2012 on the old-age type benefits below the retirement age have been relocated by the Budget Act to the National Social Fund, and thus the legal retirement age increase and the tightening of the eligibility criteria for early retirement are reflected in this category of

expenditures. In our projection, we made the assumption that the legislator's intentions will be implemented in full and only women with 40 years of service and, temporarily, persons eligible for occupational early retirement will be allowed to retire before the raised retirement age.

The changes in *healthcare expenditures* between 2012 and 2016 are driven by expenditure cuts in the sector, the adjustment steps required in the field of wages and investments to keep the system operational and, to a lesser extent, by demographic factors (for more detail, see Appendix 6.4). In the 5 years examined, the ratio of public expenditures to GDP (in particular operational expenditures) may decline by 0.6 percentage point on aggregate, due to expenditure reducing factors (Figure 12). This results from

**Figure 12**  
Healthcare expenditures as a percentage of GDP



Source: MNB.

the tightening of appropriations in 2012, the nominal freeze of a substantial part of service related expenditures extended to next year, a major cutback of pharmaceutical subsidies as well as the underlying expenditure growth trend staying below nominal GDP growth. This effect is a partially offset (by slightly less than 0.4 percentage point) by the sectoral wage increase in 2012 and the presumed additional wage correction measures from 2014 on. Even after an additional 0.1 percentage point growth due to the demographic pressure, current (operating) expenditures will remain below the 2011 level at the end of the period. Total expenditures including accumulation expenditures may fall short of their 2011 levels following the assumed approximately 0.15 percentage point increase in the volume of investments.

While the expenditures of the public healthcare system as a percentage of GDP may be at the same level in 2016 as the base of 2011, the internal structure of expenditures will change due to the measures incorporated in our projection. In addition to an increase in the level of investment, wage expenditures will grow on aggregate by 0.3 per cent of GDP (some of the wage correction measures will offset the decline in the wage level during the period). Simultaneously, pharmaceutical subsidies will decline by 0.4 percentage point: one third of that drop will be attributable to additional measures in the Structural Reform Programme 2.0.<sup>15</sup>

The *social insurance pension system* is affected directly by three regulatory changes: regular benefit increases are now indexed to inflation, the retirement age will be raised to 65 years and eligibility criteria will be tightened. We incorporate the new indexation rules into our baseline projection, with a note that in years with less than 3 per cent GDP growth the increases under the old and new regimes are identical. Even though low growth slows the relative depreciation of pensions, the new indexation rule substantially contributes to the reduction of pension expenditures as a percentage of GDP and also erodes the relative value of benefits. We have incorporated the effect of the shutdown of private pension funds; persons retiring over the projection horizon and their expected benefits are not differentiated based on their membership or non-membership status.<sup>16</sup>

Between 2009 and 2011, several measures were introduced and gradually implemented which reduce the number of recipients of old-age pension benefits: (a) the gradual increase of the retirement age to 65 years, (b) the tightening of the rules of early retirement, (c) the opportunity of retirement of women with 40 years of service irrespective of their age. The *increase in retirement age* first affects persons born in 1952; the age groups affected by the gradual increase will appear in the pension system between 2014 and 2022. Between 2014 and 2016, the effect of the retirement age increase will be somewhat mitigated by the fact that persons who retired before the tightening of the early retirement rules will continue to reduce the numbers affected by the increased retirement age. In general, the quantification of the effects of the retirement age increase is difficult as we have no knowledge of the participation characteristics for persons between the old and raised retirement age or of the probability retirement, consequently, we have only assumptions to rely on. The higher the age cohorts affected by the measure, the greater the uncertainty of retirement probabilities.

There have been a number of changes in the benefits of persons with altered working capacity as well. The new measures to promote rehabilitation and employment, to counteract the illegitimate use of benefits and the reassessment of benefits affects existing pensioners as well as new entrants. In our projection, we assumed that within the various age years the total number of beneficiaries and their breakdown by health impairment corresponding to the former categories will remain unchanged in the future, i.e. future tightening measures will not reduce the probability of entry and the internal breakdowns by health impairment will not be changed by the industry structure, the health status of the population or other factors. The benefit levels are estimated based on the weighted average of the levels set out in Act CXCI of 2011, assuming that the average wage of persons entering the system in the year preceding the award of the benefit is the same as the average wage in the national economy. We also assume that some of the present beneficiaries below 57 years of age lose their benefits or receive a lower temporary (rehabilitation) benefit. The rehabilitation benefit, available to persons deemed to be capable of rehabilitation for health and employment

<sup>15</sup> Taking into account the drop in the payments by producers and distributors due to the altered subsidy volumes, the pharmaceutical budget related component of the Structural Reform Programme 2.0 may bring about a net balance improvement of around 0.1 percentage point.

<sup>16</sup> The issue of the so-called "year 2013 rules" is relevant in this context. The pension reform enacted in 1997 set new rules applicable to persons applying for old-age pensioner status after 2012, which regulated the partial accrual of rights under the social security scheme of members of private pension funds and amended the rules of the calculation of social insurance pensions. The rules adopted in 1997 were incomplete and they would have required supplementary provision, some of them affecting fiscal policy; they cannot be applied as they stand. Consequently, just as in previous analyses, we refrained from applying these rules in this review.

purposes, is a temporary benefit of very low amount, which can be disbursed for a maximum of three years unless the recipient's health status deteriorates. In view of the time requirement of the reviews, persons reclassified into the rehabilitation regime in 2012–2013 will leave that system in 2015–2016; accordingly, at that time the number of rehabilitation benefit recipients will fall to the long-term average numbers.

Within social expenditures, some of the *family and child care benefits* will not be increased automatically as the underlying laws specify them in nominal terms. We left the nominal benefit amounts unchanged until 2014; thereafter, we increased them in line with GDP growth – otherwise they would lose their value over the projection horizon and would not fulfil their function of income substitution or supplement.

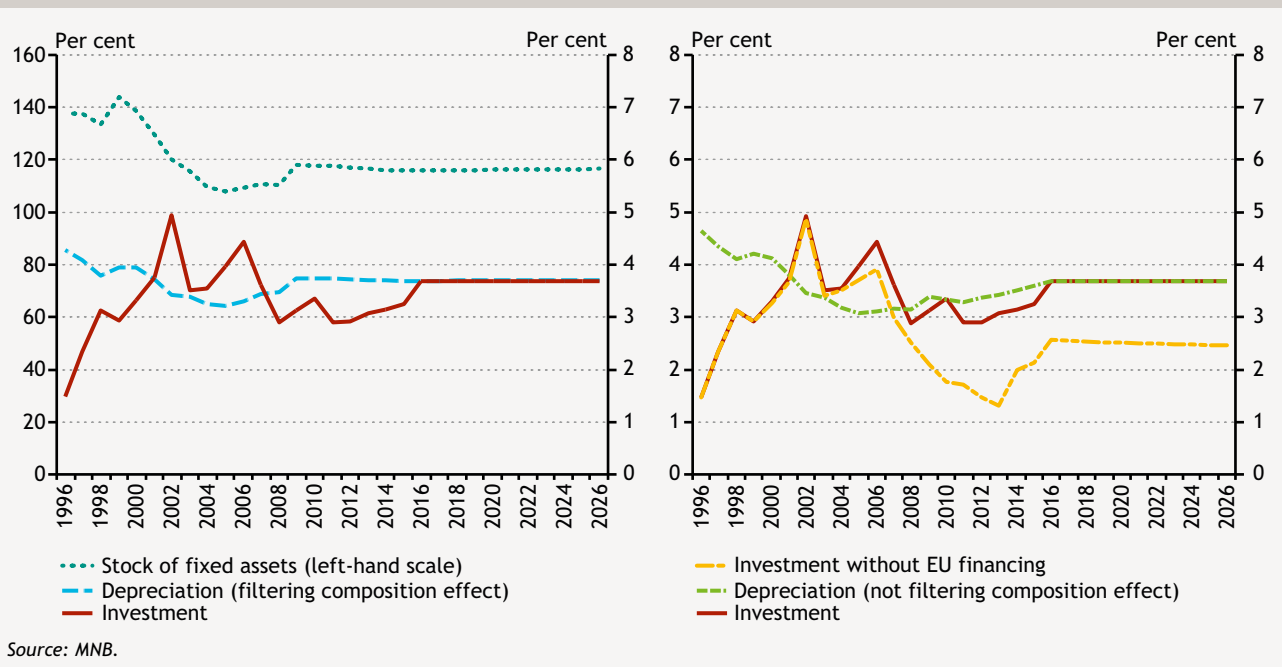
In our projection, the expenditures of *local governments* fall by 1.2 per cent of GDP between 2012 and 2016. This is explained primarily by the effects of the reallocation of responsibilities between the central government subsystem and local governments. The reallocation of tasks previously provided by local governments has a substantial impact, not only on current expenditures but also on investments. While

at the aggregate level investments of the government sector rise as a percentage of GDP, investments made in the local government subsystem decline significantly in our projection.

### 3.2.2.1 Investments

In the mid-1990s the stock of fixed assets of the government exceeded 130 per cent of GDP, while the structure of fixed assets was inadequate, with high-speed roads representing a minimal portion, for instance. Following their minimum level during the fiscal adjustment in 1995–1996, annual investment expenditures recovered to the level of depreciation only by 2001; thereafter, until 2007 the value of investments exceeded depreciation mainly because of road construction projects. Between 2008 and 2011, due to the continuous expenditure cuts, investments again started lagging behind the depreciation level determined by the size and composition of the asset stock. Due to the sale of assets no longer used and the failure to replace others, the value of assets will fall below 116 per cent of GDP by 2015, despite the construction of high-speed roads in previous years. Within this aggregate level insufficient levels of assets can be identified primarily in healthcare, environmental protection and the energy sector.<sup>17</sup>

**Figure 13**  
Depreciation and investment between 1996 and 2026 as a percentage of GDP



Source: MNB.

<sup>17</sup> The State Audit Office found that in healthcare, for instance, the share of machinery and equipments depreciated to zero rose from 37.9 per cent in 1997 to 58.9 per cent in 2002, then to two thirds in 2005. According to the CSO, in 2006 69 per cent of medical devices and 70 per cent of hospital equipments had been depreciated to zero (CSO, 2006). The insufficient investments have not reversed this trend ever since. The size of the problem is shown by the fact that according to the State Audit Office, the replacement of totally depreciated machinery and equipments would have required investments corresponding to 1.5 per cent of GDP already in 1997.

In our projection, we started from the assumption that there would be no correction in the reduced level of the stock of fixed assets. However, in order to maintain the standards of service and technology, we assumed the structure of the fixed assets to change. Accordingly, in our projection the ratio of machinery and vehicles will resume its level at the average of previous years by 2016.

In the medium term, we assume that investment expenditures will cover the depreciation of fixed assets: this is the minimum requirement if the government is to maintain the current standards of service. The combination of the declining stock of fixed assets since the turn of the century and the continuous increase in the ratio of buildings and other structures subject to low annual depreciation requirements substantially reduced depreciation as a per

cent of GDP and thus also the investment level considered to be the minimum requirement.

Changes in EU capital transfers play an important role in the growth of investment projects financed from own funds. The share of EU funds in government investments became substantial in 2010 and will peak in 2013 (Figure 13). Thereafter, we project the average EU-financed investment ratio of the 2007–2013 financial frameworks to be continued, but we assume a more even distribution within the upcoming multiannual financial frameworks. As the outlier of 2013 will not be repeated because of the return to the mean, we assume gradual growth of the investments net of EU funds until 2016, and then we foresee their stabilisation as a percentage of GDP.

### Box 3

#### Stock of fixed assets and investment requirement

The stock of fixed assets of the government sector does not contain every infrastructure fixed asset, as these may be owned by state-owned enterprises or even private businesses. Examples of private ownership include roads, student hostels, prisons or sports facilities under PPP arrangements. Consequently, the level and changes of government-owned fixed assets cannot be presented comprehensively without that category.

On the whole, it is reasonable to assume that the majority of PPP projects created new fixed assets rather than replacing existing ones; thus PPP outsourcing explains little of the close to 20 per cent drop in the stock of the fixed assets. Examples of ownership by state-owned enterprises are found in the energy supply and generation infrastructure. As these assets have not been replaced either, including the depreciation of assets serving state functions but operated by entities other than budgetary organisations would only aggravate the approximately 20 per cent drop in fixed assets as a per cent of GDP in the past 20 years. From the perspective of the investment requirement, this will mean that the cost of replacing the Paks nuclear power station, for instance, will also be borne directly or indirectly by the general government, assuming the state is to retain its participation. Under a transparent arrangement, the emphasis would shift to the consolidated balance sheet of the general government and state-owned enterprises so that the entire depreciation and investment value is captured.

The energy sector is a good illustration of investments being made in bursts. Thus, even within a stable level of investment, priorities may shift from time to time. In the 2000s high-speed road construction was a priority, while at present the weight of EU-funded sectors is on the rise, including railway and healthcare investments, where replacement needs had not been met for decades. The investment requirements listed above are not included in our projection as additional expenditure; instead, we assume that they will fit into the minimum investment requirement we expect through the rearrangement of priorities.

For the period 2013 and 2026, we assume fixed capital formation corresponding to 50 per cent of GDP. Of this, 19 per cent of GDP may relate to EU projects, including co-financing. Of this amount, the published high-speed road construction plans represent almost 10 per cent of GDP, with the majority of the remaining sum required by railway projects (MÁV). It is questionable whether the remainder will be sufficient to implement the other projects (e-toll, establishment of the congestion charge

system, environment and energy efficiency related projects).

The part not funded by the EU represents 31 per cent of GDP. Of this, investment in buildings and other structures may be 22 per cent of GDP, covering, *inter alia*, the close to 4 per cent investment need for the closure and replacement of the Paks nuclear power plant, a similar magnitude of road upgrades as well as the 1 per cent

proposed for the construction of gymnasia and stadiums. The purchase of machinery and vehicles may amount to 9 per cent of GDP, 6 per cent of which is required for the replacement of machinery and vehicles due for replacement during that period and 3 per cent to partially make up for the replacement foregone when the return to their average level occurs.

### 3.3 CAPTURING THE RESULTS OF QUASI-FISCAL OPERATIONS

During the past two decades, there were periods when the ESA fiscal balance was significantly different from the augmented general government balance<sup>18</sup> covering the broad general government, i.e. including companies performing quasi-fiscal functions. The losses continuously generated by quasi-fiscal corporations (e.g. MÁV, BKV) were typically financed by the companies by borrowing, and then when the debt reached levels at which it could no longer be financed from the market, the government assumed the debt. Under this arrangement, the budget deficit did not reflect real fiscal developments, and furthermore, the recurring inevitable debt assumptions caused major spikes in the deficit and debt indicators.

For the projection of the deficit and debt, we made the simplifying technical assumption that the classic accrual-based general government debt indicator covers all the activities of the government.<sup>19</sup> This means that quasi-fiscal operations do not generate losses or profits that are not immediately captured in the accrual based ESA deficit indicator. For instance, no new PPP projects are launched, the losses of MÁV and BKV are either immediately assumed by the state or the companies produce no losses as government transfers are increased. As somewhat of an exception, the loss (or profit) of the MNB is captured in the fiscal balance with a delay of one year, in the year after it arises.<sup>20</sup> As a result of this technical assumption, the deficit and debt path is a better reflection of actual developments and quasi-fiscal operations cause no major swings in the balance indicators.

In 2012–2013, the difference between the SNA deficit covering the broad general government and the classic ESA deficit indicator will contract significantly to 0.1 per cent of GDP. As we expect that the overwhelming majority

of the loss of quasi-fiscal corporations will be actually reflected in the ESA deficit as well, our technical assumption causes no material difference in the deficit path. Our projection also contains the development of the profits of profitable state-owned enterprises, as such revenues are distributed as dividends or left with the state-owned enterprises to fund fixed capital formation for public purposes.

### 3.4 DEFICIT PATH (2012–2016)

For the 2012–2016 period, we consider the following factors to be the most significant from the point of view of the deficit path, apart from the Structural Reform Programme 2.0:

- *Introduction of the career path model for teachers.* The wage hike resulting from the career path model for teachers will increase the expenditures of budget chapters and organisations time-proportionately in the second half of 2013 and for the whole of 2014. The wage increase will be implemented in two steps, in 2013–2014 and in 2016, adding HUF 130 billion and 160 billion, respectively, to labour costs. In 2014, the Student Loan II facility will be launched, which will represent a gradual rise in expenditure for the central budget through the financing of interest subsidies (See Chapter 4). The additional expenditure arising from the interest subsidies may increase to 0.1 per cent of GDP.
- *Phase-out of special taxes.* The abolition of special taxes will reduce the tax revenues of the central budget by a total of HUF 250 billion, and the phase-out of the half-supergrossing component of the PIT by another HUF 90 billion in 2013.
- *Cyclical drop in EU funding.* Reversion of the current high level of EU funds to the mean of the budget cycle is also tends to increase the deficit. There is also a risk that – unlike in our baseline scenario – the mean itself may also decrease. According to the assumption underlying our projection, the government will compensate for the fall in EU funding mostly from its own resources, and to a minor extent by the reallocation of private EU funds (previously allocated to the private sector), to maintain the level of investments.

<sup>18</sup> See the data on the ESA and SNA deficit, covering the broader general government, in the MNB's Reports on Inflation.

<sup>19</sup> In 2012–2013, we calculated the results of quasi-fiscal operations generated outside the scope of the budget in the way customary in the MNB's analyses, and in addition to the ESA deficit, we also quantified the SNA deficit indicator covering the broader general government. That is because we would like to maintain consistency between the deficit indicators in our publications.

<sup>20</sup> In practice, the regulation pertaining to the profits of the central bank is asymmetrical: if the central bank realises a loss and the current year's loss is not covered by retained earnings, the central budget is obliged to replenish the retained earnings in the following year. If a profit is achieved, it is not withdrawn from the MNB automatically. In practice, the profits of previous years have been added to retained earnings and served as cover for losses in later years.

- *Wage compensation, excise tax.* In contrast with the deficit-increasing measures and effects, the deficit is reduced by the phase-out of wage compensation and the increase in excise tax on tobacco.
- *Pension measures.* The parametric reform of the old-age pension system started in 2009 and the overhaul of the benefit system of persons with altered working capacity is one of the most ambitious packages of measures of recent years, with significant long-term fiscal effects. As a result of the new rules, the rate of awarding old-age pensions will slow down, while due to the tightening of the rules of early retirement, the mean age of retirement will increasingly approximate the raised legal retirement age. The benefits of some of persons with altered working capacity will be replaced by the temporary rehabilitation benefit, thus the review of the working capacity of persons below 57 years of age will result in decreased numbers in the category and will also reduce the growth of average benefits. The indexing of the regular increase of pensions to inflation is particularly important. The measures may indirectly contribute to improving the participation rate and may slow the

occurrence of the adverse labour market effects of demographic trends.

- *Interest expenditures.* The GDP-proportionate interest expenditures of the general government may increase substantially between 2012 and 2016. This is caused by the rise in the implicit interest rate, i.e. the average interest rate of public debt. For the reasons explained in Section 2.1, the implicit interest rate is very low at present, but in the coming years the higher volumes of bond issues at an elevated interest level as well as changes in the structure of debt are expected to drive the implicit interest rate up. In respect of the structural change in the debt, the refinancing of the loans extended by international organisations from the market and the rising share of HUF debt may cause an increase in interest burdens (for more details, see Chapter 4.4).

As a result of these factors, in the absence of the Structural Reform Programme 2.0, the ESA deficit would rise by 1.8 percentage points on a 4-5-year horizon, while the cyclically adjusted primary balance would deteriorate by almost 2 percentage points from the 2012 level.

#### Box 4

#### Fiscal impacts of the Structural Reform Programme 2.0

For the analysis of the impact of the Structural Reform Programme 2.0 on the deficit, we quantified the gross and net effects of the measures, whether set out in legislation or otherwise known in sufficient detail, that may be considered addition to the trends or measures already captured. To quantify the net effects, we calculated the direct tax revenue foregone due the various measures as

**Table 4**  
**Estimated net effect of the Structural Reform Programme 2.0 on the balance**  
*(HUF billion)*

	2012	2013	2014
Reduction of expenditures of budgetary institutions and chapters	35	35	36
Reduction of pharmaceutical subsidies	3	25	29
Introduction of a telecommunication services tax*	25	50	51
Introduction of reverse charge VAT in agriculture	0	5	5
Launching the electronic road toll at an increased level	0	39	100
Elimination of central subsidies to the Research and Technological Innovation Fund	0	25	30
Introduction of a financial transaction levy	0	127	134
Maintaining and extending the income tax levied on energy providers	0	33	35
Merging and transforming current taxes levied on insurance companies**	0	5	6
Reduction of the number of minor taxes	0	-5	-5
<b>Total</b>	<b>63</b>	<b>338</b>	<b>421</b>
<b>Net effect as a percentage of GDP</b>	<b>0.2</b>	<b>1.1</b>	<b>1.3</b>

\* Introduced as of 1 July 2012.

\*\* New taxes on CASCO, property and accident insurance, abolition of the fire protection contribution and the remaining half of the "bank levy" on insurance companies.

well as the investment and maintenance costs relating to their implementation. Furthermore, we estimated the extent to which the government measures aimed to increase tax revenues will cut into corporate profits, resulting in foregone corporate profit tax revenues. Taking into consideration these direct and indirect effects, we estimated the potential net balance improvement brought about by the measures.

The deficit reducing effects are typically mitigated by the estimated VAT revenue erosion in respect of the expenditure side measures and the reduction in the corporate income tax level in respect of tax increases. For the e-toll, the operation of the system leads to additional expenditures while in the case of the pharmaceutical price subsidy cuts the net deficit effect is reduced because, under the current regime, the payments by pharmaceutical producers to the budget will decrease as a result of the measure.

We estimate that the Structural Reform Programme 2.0 may contribute substantially to the reduction of the fiscal deficit in the longer run (Table 4). From 2015 on, the primary balance improving effect of the package may increase permanently to 1.4 per cent of GDP.

**Table 5**  
**Balance indicators with the effects of the Structural Reform Programme 2.0**

(per cent of GDP)

	2012	2013	2014	2015	2016
1. ESA primary balance	1.1	0.6	0.3	0.2	-0.1
2. Net effect of Széll Kálmán Plan 2.0	0.2	1.1	1.3	1.4	1.4
3. ESA primary balance with Széll Kálmán Plan 2.0 (1+2)	1.4	1.7	1.6	1.6	1.3
4. ESA interest expenditure	-4.0	-4.1	-4.3	-4.2	-4.2
<b>5. ESA balance with Széll Kálmán Plan 2.0 (3+4)</b>	<b>-2.7</b>	<b>-2.4</b>	<b>-2.7</b>	<b>-2.7</b>	<b>-2.9</b>
6. SNA-balance	-2.8	-2.4	-2.7	-2.7	-2.9
<i>Memo:</i>					
<i>ESA balance in case of the cancellation of chapter reserves</i>	-2.5				

*Note: In the table we assumed that the unallocated central reserves would be cancelled.*

*Source: MNB.*

The measures in the Structural Reform Programme 2.0 substantially improve the general government balance. In addition to consistent implementation of the plan, the decreased interest expenditures resulting from the lower deficit path may bring about additional savings rising to 0.3 percentage point of GDP by 2016.

After cancellation of the central reserves, the GDP-proportionate ESA deficit may be around 2.7 per cent in 2012 and 2.4 per cent in 2013. Because of its conditionality,

in our baseline scenario we did not include the freezing of the chapter-administered appropriations proposed for 2012 and amounting to 0.2 per cent of GDP. If the appropriations are cancelled and are definitively incorporated into the base (rather than as a temporary cost saving), in 2012–2013 the deficit may reach the 2.5 and 2.2 per cent targets of the Government. The ESA deficit may remain consistently below 3 per cent, while from 2014 on the Government's deficit targets may be attained only through additional measures.

# 4 Debt projection (2012–2026)

The purpose of this chapter is to present the medium-term debt projection. As the first step, we present the macroeconomic path underlying the projection. Our assumptions relating to demographic and labour market trends are crucial, both for the macroeconomic projection and for the expenditure and revenue trends of the budget; therefore, these issues are addressed separately in the appendices (see Appendices 6.2 and 6.3).

After explaining the factors driving the changes in the primary budget balance, we focus on the long-term trends of the costs of financing because, on the one hand interest expenditures play a major role in the total deficit, and on the other hand the debt ratio is determined to a large extent by the relationship between the real interest rate paid on the debt and real growth. For the projection of debt, we also need to take into account the items other than the budget deficit that affect the nominal debt level.

Next, we present the medium-term debt dynamics and the results of the partial sensitivity analyses for the primary fiscal balance, interest rate, exchange rate and growth rate. Finally, comparing the outcome of the debt projection with the various debt targets and assuming other factors to be constant, we investigate the magnitude of additional fiscal balance improvement required for the attainment of the debt target on the given horizon, that is, the size of the so-called “fiscal gap”.

## 4.1 TECHNICAL PROJECTION OF GDP GROWTH

The expected macroeconomic path is one of the important inputs for calculations of the debt path. Following from the rationale of our projection, on the 15-year horizon we consider as given both the government measures set out in the Convergence Programme and the international environment.

We assume that in the period up to 2016 the current negative output gap will gradually close. Even though the improvement of the cyclical position of the economy may provide some growth surplus for the economy as we expect a slow recovery from the European debt crisis in this period and the continuation of the low global risk tolerance, the capacities of the economy may expand at a very slow pace. Thus, actual growth may be around 2 per cent despite the improving cyclical position.

For the second phase starting in 2017, we assume that the economy will follow a course corresponding to its potential growth; thus, we project with no further cyclical effects. In this period, as funding costs return to normal, the amount of external funding and growth in our export markets may both improve. Nevertheless, we do not assume that growth rates return to the pre-crisis levels. We expect that the Hungarian economy will reach the 2.5 per cent potential growth rate gradually.

**Table 6**  
**Macroeconomic assumptions**  
(per cent, 2017–2026)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Economic growth	2.2	2.3	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Inflation	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Activity rate	59.5	59.9	60.2	60.4	60.7	60.8	61.0	61.1	61.3	61.6
Unemployment rate	12.1	11.9	11.6	11.2	10.9	10.5	10.1	9.7	9.3	9.1
Real implicit interest rate of HUF government bonds	3.6	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8
Real implicit interest rate of FX government bonds	3.8	3.7	3.6	3.5	3.4	3.3	3.3	3.3	3.2	3.2



As we assumed policies to remain unchanged in the projection, we do not expect Hungary to join the euro area.

Our medium-term growth projection can be approached in two different frameworks: from the side of convergence or the accumulation of the factors of production.

#### 4.1.1 Convergence approach

If we think in terms of convergence, economic growth is the result of two factors: growth in our main trading partners and the sustainable balance of payments position. From this aspect, the Hungarian economy ended up in a less favourable growth environment after the financial crisis. In the pre-crisis period, the behaviour of investors was characterised by the underpricing of macroeconomic risks, which allowed certain economies to become persistently overheated and to accumulate substantial financial imbalances. The crisis brought a reassessment of risks. Investors are expected to be more conservative than in the previous decade in financing countries with sizeable macroeconomic imbalances. Thus, even after the extreme fluctuations seen during the crisis dampen, risk premia may remain persistently above the pre-crisis levels.

The change in investor preferences has a dual effect on the growth prospects of economies, through a “flow” and a “stock” effect. Because of the flow effect, a growth path involving a current account deficit will be more difficult – more risky and more expensive – to maintain. The “stock” effect means that, due to the external and fiscal debt stock accumulated in the past decade, countries will be considered more risky if in the future their growth relies more on domestic funding than in the previous decade. Thus, the more conservative approach to risk makes external financing more expensive and more volatile, while domestic actors will need to use a greater proportion of the income produced to repay debt. All of this hinders economic growth. In addition to the direct effects of funding costs, the more cautious spending of businesses and households due to the increased uncertainty may also have an adverse effect on growth. Experience shows that the adjustment of highly indebted countries and economies previously showing macroeconomic imbalances may take decades if the stock effect is dominant.<sup>21</sup>

Considering that both Hungary and some euro area Member States have significant financial imbalances, our growth potential is constrained from two sides by the need to reduce debt. The growth of the euro area, our main trading

partner, is expected to be lower than before the crisis, and we can also sustain a lower current account deficit.

In our 2010 Convergence Report, we considered that real convergence may slow down to some extent in the coming decade depending on the ability of the country to raise external funding. Assuming 1-1.5 per cent growth in the euro area,<sup>22</sup> we considered a growth potential of 2.5 per cent reasonable in the baseline scenario and 2 per cent in the risk scenario. The former one is consistent with a permanent 3 per cent external financing requirement, while the latter demands a balanced current account. In our current projection, we reckon with the lowering of financing costs as the global financial situation returns to normal in the second half of the decade. In that environment, the Hungarian economy will be able to gradually achieve a 2.5 per cent trend growth rate and external funding corresponding to approximately 3 per cent of GDP. Even though this situation is considerably more favourable than the trend assumed for the pre-2016 years, it is still below the trends seen before the crisis.

#### 4.1.2 Factors of production approach

Another possible approach to our medium-term growth prospects is to look at the expected development of the factors of production. As financing constraints tighten, capital accumulation will suffer the most obvious decline while the effects of the crisis on productivity and employment are less clear-cut. Productivity improvement is hindered by the fact that because of the more stringent credit supply conditions, innovative businesses will be more likely to be driven out of the market and even financing viable companies becomes impossible. On the other hand, as competition intensifies in the wake of the crisis, low-productivity firms may exit. There are counteracting tendencies for employment as well, though the balance seems unfavourable in the short term. The changing structure of the economy, which is an inevitable result of the crisis (mostly the withering of highly leveraged sectors or industries producing for the domestic market) may increase frictional unemployment with a permanent effect. The reduced number of jobs may also have an adverse effect on the willingness to search for jobs. These unwelcome trends are somewhat counterbalanced by the fact that due to the deterioration of income prospects, the willingness to take on employment may increase, particularly among secondary earners. Finally, we also need to consider that a crisis may act as a catalyst for long-put-off reforms, as currently evidenced in several European countries.

<sup>21</sup> See for example McKinsey (2010).

<sup>22</sup> For more details on the assumptions, see: Analysis of the Convergence Process, Magyar Nemzeti Bank 2010.

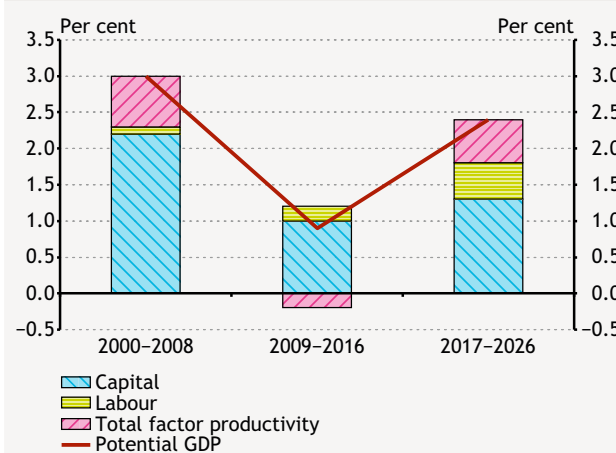
These considerations are reflected in the changes in factors of production in Hungary as well. The corporate investment rate declined from 20 per cent before the crisis by some 5 percentage points, while the volume of household investments sank below the level seen at the transition period in the early 1990s. The tightening of credit supply conditions also worsened productivity. On the other hand, compared to the pre-crisis situation, we have seen an improving trend in labour supply mostly due to the systematic policy interventions of recent years.

Since 2009, the changes in the institutional system of the labour market were conducive to raising the participation rate partly through the reform of the taxation system (reduction of taxes on labour with a shift towards indirect taxes) and partly through stricter rules for social benefits (pensions, family benefits, social benefits, public employment).<sup>23</sup> Our earlier calculations show that in the best-case scenario these effects could yield a 0.5–0.8 percentage point growth surplus in the years to come.<sup>24</sup> However, if the increased labour supply is to effectively contribute to production growth, labour demand must also increase. This requires an expansion of investments and a temporary lowering of real labour costs. Unfortunately, at present the manifestation of the effects assumed in our earlier calculations is hindered by the government measures affecting the cost of employing low-wage workers and by the sovereign risk premium curbing investments. Consequently, in our calculations we assume that the growth surplus arising from a higher willingness to take up employment will only be realised gradually, over a timeframe of 5–10 years.

On the whole, production factors also substantiate the assumption that in the environment of a slow relaxation of financing constraints, potential growth may accelerate gradually to around 2.5 per cent by the end of the decade. This results from the combination of capital accumulation and productivity growth lagging behind the pre-crisis levels and the stronger employment expansion. Furthermore, we expect businesses to amend their labour demand to assure that the ratio of labour income in the value added remains constant. Households' propensity to save will also remain unchanged, and thus their level of consumption as a proportion of GDP will be constant.

For the analysis of expected employment trends, we took into account the potential effects of demographic changes (for more details, see Appendixes 6.2 and 6.3). Economic

**Figure 14**  
Contribution of factors of production to potential growth



Source: MNB.

activity is closely linked with several demographic and social factors (such as age, gender, qualifications). In light of the expected demographic trends, we can estimate the changes in the composition of society in terms of the criteria relevant for participation. Furthermore, we assumed the unemployment rate to reach its long-term equilibrium level by around 2026. As a combined result, until 2020 approximately 40,000 new jobs may be created annually on average, and then the level of employment may stabilise. The employment rate of the 15–74-year age group may rise from the current approximately 50 per cent to about 57 per cent by 2026.

## 4.2 ASSUMPTIONS ON BUDGET ITEMS SENSITIVE TO DEMOGRAPHIC CHANGES

On the projection horizon, the size and age composition of the population will change. In the following, we discuss the budget items which are directly affected by demographic changes and deserve special attention because of their sheer magnitude. In addition to their demographic sensitivity and size, pension, health and education expenditures are particularly interesting as recent measures have affected all three subsystems and functions.

### 4.2.1 Pension expenditures

The procedure for the recording of pension expenditures was changed by the Budget Act of 2012: new terminology was introduced and benefits were reclassified into larger

<sup>23</sup> The raising of the retirement age and the tightening of disability benefits started before the crisis, which was reflected in the continuously rising participation rate. (see Kátay and Nobilis, 2011) In addition, measures detrimental to labour supply were also adopted, such as the significant minimum wage increase and the phase-out of the tax credit.

<sup>24</sup> See the convergence reviews of 2010 and 2011.

categories. We considered these changes immaterial to the estimation of pension expenditures: all benefits that have the characteristics of pensions were accounted for as pension expenditures irrespective of their name or whether they are presented in the budget as expenditures of the National Pension Insurance Fund, the National Health Insurance Fund or the National Social Fund grouped under the Ministry of National Resources.<sup>25</sup>

In the medium and long term, pension expenditures are determined mostly by demographic trends; expenditures of the system are driven by the existing portfolio of pensioners due to the slow pace of attrition. Due to the modified rules, the demographic position of the population and that of the pension system may follow different paths in the medium term; however, the size and composition of the population function as a constraint on the internal demographic developments of a system aiming for universality. On our projection horizon, Hungary's total population will decline by 3 per cent, while the number of persons over 60 years of age will increase by 14 per cent. Simultaneously, the number of the 20-59 age group will drop by 8.5 per cent.

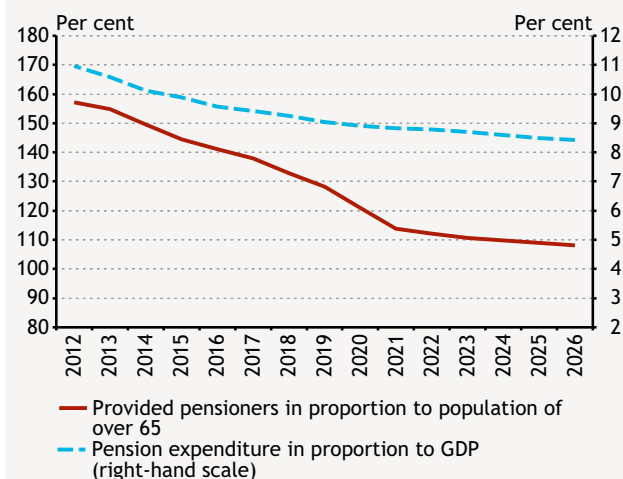
However, the deterioration of the demographic situation will be offset by measures affecting the number of beneficiaries and the assumptions concerning the increase of participation and employment. Furthermore, the financial equilibrium of the pension system is also affected by the relative growth rate of average contributions versus average benefits, as well as the gradual lowering of the new pensions as compared to the average of discontinued benefits. As the course of expenditures is driven by the number of beneficiaries and the increase in the specific benefits of the stock (with a slow replacement), the rules of indexation are particularly important.

In respect of the number of beneficiaries, we assume that the declining number of recipients of survivor's main benefit will continue – at a decelerating rate – because more and more persons will become eligible for other, mostly old-age, benefits. Regarding benefits to persons with altered working capacity (invalidity benefit recipients), we assumed that the tightening of rules that affected the speed of entry in the past five years will cease to have

effect in the future, while for some of the beneficiaries the disability benefit will be replaced by a temporary rehabilitation benefit, which can be disbursed for no more than three years. We also assumed that the new benefit categories have an effect on the expenditures of the remaining beneficiaries. As regards the number of old-age pensioners, we assumed that persons in the cohorts that reach the statutory retirement age and receive no survivor's or disability benefits will become eligible for old-age pension. We increased the mean age of retirement parallel with the legal retirement age and, with the exception of women with 40 years of service, we assumed that the no old-age pension before the retirement age will be awarded after 2013.

In the medium and long term, pension indexation has the most marked effect: while the reduction or slow growth of the stock of recipients will come to an end by 2022 for most benefits, the change in indexation is conducive to a continuous reduction of expenditure as a percentage of GDP, because economic growth is assumed to exceed the price index by 1.9 per cent on average.<sup>26</sup> Because of the rising ratio of the elderly, the number of people above 60 is increasing, despite the declining population. This growth, however, is offset by the retirement age increase and the

**Figure 15**  
Pension expenditures and beneficiaries, 2012–2026



Source: MNB.

<sup>25</sup> Old-age type benefits paid below the legal retirement age have been removed from the "old-age pension" expenditures of the National Pension Insurance Fund; they are now disclosed in the budget under the National Social Fund as "benefits under retirement age". The category of disability pension has been abolished: from 2012 on, benefits to persons past the retirement age receiving pension on the grounds of health impairment are disclosed within the old-age pension expenditures of the National Pension Insurance Fund. Benefits below the retirement age previously known as disability and accidental disability pensions are, in conjunction with the reform of the system of benefits to persons with altered working capacity, disbursed by the National Health Insurance Fund as disability benefit or rehabilitation benefit, depending on the extent of impairment, the possibility of medical and employment rehabilitation and age.

<sup>26</sup> The relationship of indexation rules to inflation and net wage growth determines the real and relative income position of pensioners: while under the present indexing system the purchasing power of a benefit does not decline throughout the term of disbursement, a 2 per cent annual increase of net real wages would halve the relative value of a benefit in our time frame.

effects of the tightening of retirement rules. In the second half of the projection horizon, when the effect of tightening measures has been fully incorporated and the number of new awards increases, the growth of the number of elderly (that is, potential new retirees) slows down and becomes insufficient to offset the effects of indexation. As a combined result, the ratio of GDP-proportionate pension expenditures will fall by approximately 2.4 per cent by 2026; one fourth of this is explained by the tighter rules concerning the number of beneficiaries and three fourths by the indexation rules.

## 4.2.2 Healthcare

Along our projection path, by 2026 public healthcare expenditure as a percentage of GDP will increase by an additional 0.3 percentage point compared to the level projected for 2016, and thus may amount to 5.7 per cent of GDP. The net fiscal effect of this additional growth corresponds to approximately 0.2 per cent of GDP. Accordingly, our calculations show that between 2012 and 2026 (compared to the baseline projection excluding the sectoral wage correction of 2012), the primary balance may worsen by close to 0.4 percentage point per year, due to the required expenditures in the healthcare sector. Of this deterioration of the primary balance, slightly less than 0.3

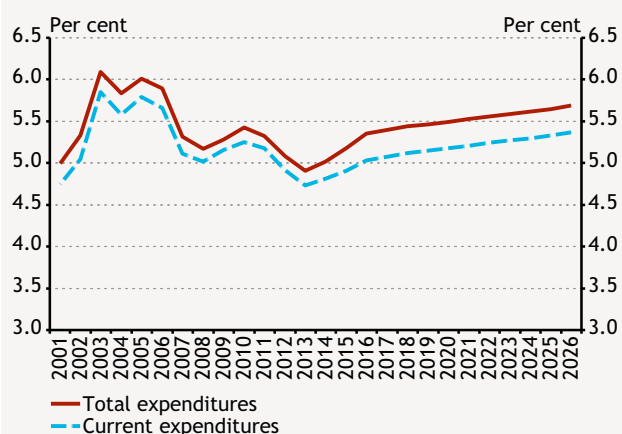
percentage point relate to the expansion of current (operational) healthcare expenditures while the remaining 0.1 percentage point is attributable to the higher investment level.<sup>27</sup>

After 2016, GDP-proportionate public healthcare expenditures will change exclusively due to demographic trends as in this period we do not expect any specific additional measures and the basic expenditure trend is identical with nominal GDP growth (for more detail, see Appendix 6.4).<sup>28</sup> The cost increase arising from the expected shift in the age profile of the population is reflected only in current expenditures: this expenditure component may increase from 5 per cent of GDP to almost 5.4 per cent by 2026, in parallel with the gradual but relatively moderately paced ageing of the population. By contrast, in the case of healthcare investments our projection shows a rise in expenditures up to 2016, followed by a period of consolidation. Investments as a percentage of GDP will permanently remain at the increased value of 2016.<sup>29</sup>

The level of public healthcare expenditures projected for 2026 is moderate both historically and in international comparison. This is because in our projection the future level of expenditures is fundamentally determined by the current standards of service. Even at the end of the 15-year period healthcare expenditures will not reach the level observed in the first half of the 2000s, when public healthcare expenditures in Hungary exceeded 6 per cent of GDP. The 5.7 percentage point expenditure level projected for 2026 is 1 percentage point lower than the average public expenditure reported by the OECD for EU Member States between 2007 and 2009, corresponding more or less to the average of the other Visegrád countries in the same period, although it lags behind the most recently published value for 2009 for these countries (6.1 per cent of GDP).

**Figure 16**  
Projected path of public healthcare expenditure up to 2026

(per cent of GDP)



Source: MNB.

## 4.2.3 Education expenditures

The Public Education Act adopted in December 2011 is important in determining education expenditures. As a result of the measures and taking into account demographic trends, by 2021, when the public education reform is completed, the gross wage costs of the general government will be 0.1 percentage point of GDP higher than in 2016.

<sup>27</sup> We should note that in our analyses we estimated government investment on an aggregate level, and allocated the investment volume change "in a virtual sense" among the various sectors. Accordingly, the balance effect of investments is also recorded in aggregate rather than for each functional expenditure area.

<sup>28</sup> The functional breakdown of public healthcare expenditures follows the OECD definition, which exceeds by 0.2-0.3 percentage points the GDP-proportionate level calculated on a COFOG basis.

<sup>29</sup> Our projection does not take into account the effect of technological innovation on healthcare expenditure. In a more complex analytical framework the relationship of investment level and depreciation cannot be examined independent of the expected trend of technological innovation. Thus the assumption of an investment "consolidation" period probably yields a rather conservative projection of expenditures, at more modest levels than compared to other, more plausible scenarios.

The changes in the public education system – other than the career path model and the demographic trends – jointly have a near-neutral effect on the future development of wage costs, while the introduction of all-day schooling under tighter terms than we assumed may trigger a greater wage expenditure growth than we projected. Between 2017 and 2026 the size of cohorts using kindergarten services will fall by 0.7 percentage point on average per year, the number of children in institutions of elementary education will decline by an average of 0.6 percentage point per year in the same period, while the size of cohorts in secondary education institutions will on average continue rising slightly in the period. However, the expenditure reducing effect of the lower number of children will be largely offset by the additional costs of the introduction of daily physical education as well as the higher expenditures attributable to the full-scale introduction of the career path model by 2018.

We were unable to estimate the wage cost effects of the career path model for teachers in higher education as the Act on Higher Education fails to specify the date and specificities of the new model's introduction. The other measures geared towards rationalising higher education expenditures (student quotas, reform of the system of institutions, financing conditions) also contain a number of uncertainties; therefore, we made the simplifying assumption that the effects of expenditure increasing and decreasing measures will cancel each other out over the projection horizon.

### 4.3 PRIMARY BALANCE (2017–2026)

In addition to the demographically sensitive items described in the previous section, certain past measures and their development over time, external factors (EU-related items) as well as the growth of certain items at a rate different from nominal GDP growth will all affect the deficit after 2016. The most important measures affecting the primary balance will exert their effects in the 2012–2016 period; thereafter, we reckon with no other substantive revenue or expenditure shocks.

The main measures and trends affecting the primary balance after 2016 are the following:

- Implementation of the fiscal measures set out in the agreement with the Banking Association (exchange rate cap, property purchases by the state-owned asset manager institution) by 2017.

- The end of the next EU budget cycle and the simultaneous temporary decline in EU transfers in 2021–2022 will cause a drop in the primary balance.
- The expected fall in tobacco consumption will erode revenues as a percentage of GDP.
- Both the PIT and social contributions will change in line with the gross wage bill index between 2016 and 2026.
- Over the entire horizon, taxes, contributions and duties payable by households will rise from 17.1 per cent of GDP to 17.8 per cent, which is attributable to the different rate of growth of GDP and the gross wage bill.
- In respect of primary expenditures, transfers to households stand out, falling from 13.8 per cent of GDP to 11.1 per cent throughout the horizon. The decline is caused primarily by the parametric reforms of the pension system, affecting the number of entrants (legal retirement age rise, tightening of rules of eligibility for retirement below the legal retirement age), the total headcount and benefits of the current recipients (review of the health status and benefits of persons with altered working capacity) and the regular increase of benefits (price indexation). The reduction of transfers is also promoted by the low birth rate, which affects expenditures on family and child raising benefits, as well as by unemployment benefits, where both the assumed improvement of employment indicators and the low level of benefits are conducive to improving the balance.

As a result of the above processes, the primary balance will show an improving trend in 2017–2026, rising from 1.3 per cent of GDP to 2 per cent of GDP by 2026.

### 4.4 INTEREST BALANCE, FINANCING COSTS

The financing cost, i.e. our assumption concerning the development of the sovereign foreign currency and forint yields, plays an extraordinary role in the projection of the debt ratio. Analyses on the sustainability of debt always feature the difference between the real interest expenditure and real growth ( $r-g$ ) as a key indicator. The higher the difference between interest and real growth, the greater the primary surplus the budget must produce to stabilise or reduce the debt ratio.<sup>30</sup>

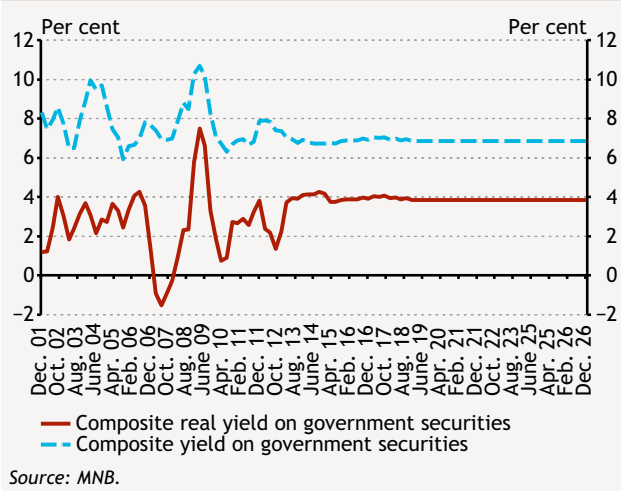
<sup>30</sup> For the effect of the real interest rate, real growth and real exchange rate changes on the development of debt, see Czeti and Hoffman (2006).

In our projection, we expect the sovereign risk premium, a determinant of yields, to fall significantly in the medium term. However, we assume that over the projection horizon the premium will not return to the consistently low level seen in the pre-crisis era.

### 4.4.1 HUF and foreign currency interest rates

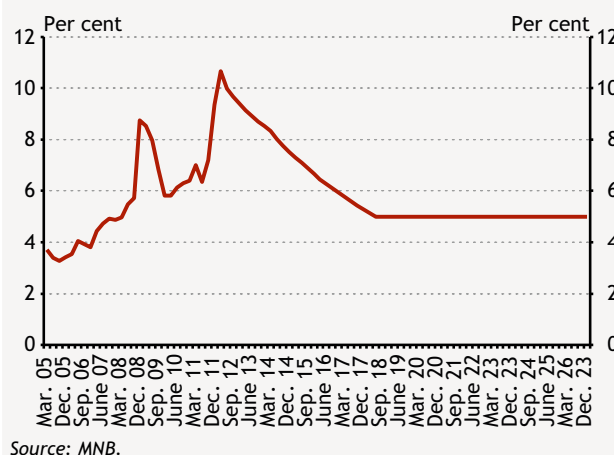
Estimation of the market yield of HUF government securities relies on the assumed long-term equilibrium economic development and an improved risk perception of Hungary. The yields of government securities with different maturities have been converted into a composite index, which takes into account the yields of the various maturities with the weighting corresponding to their ratio within public debt. The index is closest to the yields of 3-year and 5-year bonds, which is in line with the average remaining maturity of the debt. We estimate yields on the government securities market to be around 7 per cent in the long term, which – assuming a 3 per cent inflation rate – would mean that the real yield is slightly below 4 per cent, or 0.9 percentage point above the levels observed between 2002 and 2006.

**Figure 17**  
HUF government securities yields assumed in the projection



In the long term, foreign currency yields may be around 5 per cent, which is almost 2 percentage points below HUF yields, resulting in real yields of around 3 per cent in EUR terms. The projection is based on the risk-free yield and the Hungarian risk premium. We estimated the risk-free yield to be 3.5 per cent, based on the potential growth of the euro area estimated at 1.5 per cent and its 2 per cent inflation target. Early in 2012, the premium was at very high levels and in the long term we expect a substantial decline, but we still

**Figure 18**  
Foreign currency bond yield assumed in the projection



project that the nominal and real yields of foreign currency bonds will remain above the pre-crisis values: the technical assumption we used for the long-term premium of sovereign foreign currency bonds is 150 basis points.

### 4.4.2 Implicit interest rate of public debt

In 2011, the implicit interest rate of the Hungarian public debt, i.e. the average interest rate projected for the outstanding debt, reached its lowest level since data are available (see Section 2.2). Nevertheless, based on our yield curve estimates, we expect an increase already in the short term. At first glance, the simultaneous assumption of the decline of current yields and the increase of the implicit interest rate may appear to be contradictory, but the structure and repricing of the public debt explains this development.

- As the most important factor, the current high market yields are only reflected to a small degree in the implicit interest rate. On the one hand, this is because a substantial part of the debt (particularly in the case of foreign currency bonds) was issued at the pre-crisis lower yields, and on the other hand, since 2008 non-market funds (from the EU and IMF credit facility), at interest rates below the rates of HUF and foreign currency bonds, have represented a significant part in the public debt.
- Thus, the debt will be repriced gradually, meaning that the implicit interest rate will only slowly follow the rise or fall of market rates. Even after their expected decline, the assumed long-term level of market yields is higher than the current implicit interest rate, which will necessarily lead to the rise in the latter.

- The increase of the implicit interest rate will be accelerated by two factors: 1) we assume that the share of HUF-denominated debt will increase, which typically bears a higher interest rate than foreign currency debt; 2) the IMF-EU loans will mature by 2016 and are expected to be refinanced at market rates.

In accordance with the structure of the outstanding debt, we expect most of the HUF debt to be repriced in 6 years. Initially, repricing of the foreign currency debt is faster because the overwhelming majority of the EU/IMF loans, extended at rates below market yields, will mature between 2012 and 2015, and their refinancing in foreign currency will increase the implicit foreign currency interest rate.<sup>31</sup> Thus, in 2017 the implicit interest rate would effectively be identical to its estimated long-term value of 6.3 per cent.

We assume that in the long term the share of foreign currency within the public debt will decline to its pre-crisis level. As a result of the IMF/EU package, the share of foreign currency within gross public debt rose from around 30 per cent before the onset of the crisis to 46-47 per cent in 2009–2010, and then in 2011, as a result of the depreciation of the forint and the withdrawal of some of the HUF government securities, it rose to 52 per cent. Such a high share of foreign currency financing is suboptimal in the long term, as it increases the vulnerability of the economy; therefore, we assume that the share of foreign currency liabilities within the public debt declines to 34 per cent by 2026.

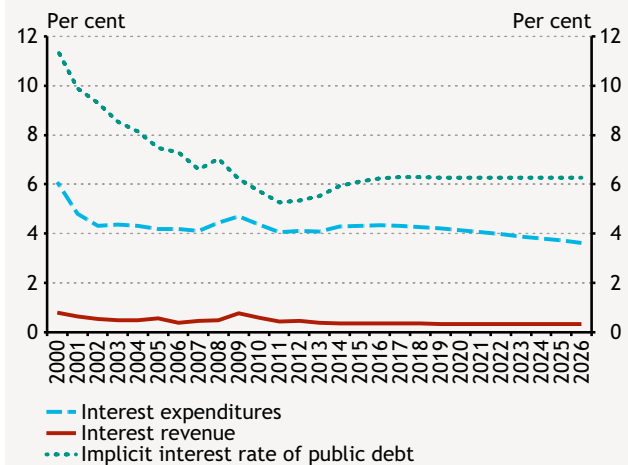
In our projection, the ratio of interest expenditures to GDP will rise in the medium term, while in the long term we may see a reversal of that trend. The implicit interest rate and the development of debt driven by the primary deficit directly determines interest expenditures as a proportion of GDP at the projection horizon. Initially, the rise in the implicit interest rate may exert a more marked effect, resulting in a slight increase in gross interest expenditures. After 2017, however, the impact of the falling debt ratio will prevail, continuously reducing interest expenditures. As a result of the use of foreign exchange deposits, interest revenues may fall in the short term, but subsequently they are expected to remain level as a percentage of GDP.

#### 4.5 OTHER FACTORS ASIDE FROM THE DEFICIT AFFECTING NOMINAL DEBT

The budget deficit is an indicator consistent with the changes of net financial liabilities arising from transactions. Thus, the

**Figure 19**  
Interest revenues and expenditures

(per cent of GDP)



Source: MNB.

projection of the deficit yields “unequivocal” conclusions concerning the net financial liabilities as a stock indicator.

Nevertheless, analyses of the medium-term sustainability of the budget tend to focus on gross public debt, and most of the fiscal rules also rely on the gross public debt figure. Therefore, we also focus on gross public debt in our projection. However, in order to project the gross debt ratio, we need to make assumptions concerning the development of the deficit, GDP and the exchange rate as well as the financial assets of the government. That is because the reduction of liquid and illiquid financial assets is conducive to the reduction of the debt ratio even with all other factors remaining constant.

For the projection of debt, in addition to financial assets we also need to take into account the financial liabilities that are not included in the debt figure, but affect the debt. On our projection horizon such a liability arises due to the new student loan arrangement. The new arrangement offers interest rate subsidised, restricted-use loans, at an interest rate cap of 2 per cent, to students paying full or partial tuition fees. The interest rate subsidy directly increases the deficit, while as a result of its statistical treatment, the total stock of credit extended is incorporated in the public debt.

Finally, mention should be made of the debt accumulated recently by quasi-fiscal operations, which is likely to be assumed in the future and in time be added to public debt.

<sup>31</sup> In line with the Government’s communication, we assume that the purpose of the new EU/IMF agreement proposed for 2012 is a precautionary credit line. Consequently, we do not expect the Government Debt Management Agency (ÁKK) to draw down funds from the new facility.

Such debt assumptions tend to also increase the deficit, but in our baseline scenario we have not taken that effect into consideration.

#### 4.5.1 Financial assets

Since 2008-2009, the central budget has had higher financing reserves than are customary or required for short-term liquidity. Based on the convergence program of 2012, we assume that in the medium term the government will use some of the financing reserves. A substantial part of the reserves in the government's account at the MNB was accumulated when the IMF and EU loans were drawn down. Another source is the private pension fund portfolio acquired by the government in 2011, of which 2.1 per cent of GDP was still available at the end of 2011 according to the figures of the ÁKK.

The uncertain environment and the present risk perception of Hungary may necessitate the maintenance of the reserves in the medium term. Pursuant to Act CLIV of 2010, the revenues of the Pension Reform and Debt Reduction Fund must be paid into the budget or used towards the reduction of debt, but the Act remains silent on the timing of such payments. In our projection, we started from the government's strategy stated in the 2012 convergence programme, which provides that the budget will not make use of the private pension fund assets until 2015. Assuming that the strategy remains unchanged, those assets will remain in state ownership throughout the horizon of the projection and their value increases at the rate of nominal GDP growth. Maintenance of the assets will increase the budget balance through their (estimated) yield, which is recognised among interest revenues. If the government uses the assets of the fund to reduce the debt at a given point in time, the GDP-proportionate debt ratio could decline by 1.7 percentage points.

The convergence programme proposes the use of some one third of the foreign currency deposits by 2015. In view of the higher deficit path which we expect, we expect the use of all such assets by the end of 2016. The use of a greater share

of the assets than proposed in the convergence programme reduces the debt by 0.8 per cent of GDP. We do not expect the sale of the state-owned MOL shares and we assume their value to be constant as a percentage of GDP. The swap of MOL shares for government securities and the withdrawal of the latter could reduce the debt ratio by 1.5 percentage points depending on the future price of MOL shares.

#### 4.5.2 Student loan II

The Student Loan II arrangement is considerably different from Student Loan I: there is no maximum to the loan amount and borrowers receive a government interest rate subsidy. The interest rate payable by borrowers is maximised at 2 per cent, while the government reimburses the Diákhitel Központ (Student Loan Company) for the difference of the actual cost of the credit (cost of funds and other charges) and the 2 per cent. After graduation, borrowers pay instalments based on their income from two years ago, but the rates are differentiated depending on the loan amount.

We examined how the interest rate subsidy granted to students affects the deficit and the effect Student Loan II has on the public debt. In our calculations we relied on the following assumptions:

- We took into account the probable trends in demographics and participation in higher education in determining the number of borrowers, while also taking into consideration the current distribution of quotas between tuition fee-paying and state-financed students.
- For the estimation of the debt stock, we assumed the present average cost of education to remain constant in real terms, taking into account the different costs of bachelor- and master-level education.
- We also included early repayment: based on the 2010 figures, we determined the ratio of actual to required instalment payment at 172 per cent. However, this is likely to be lower for the new facility as it contains no incentives for accelerated repayment.<sup>32</sup>

**Table 7**  
Financing reserve available to the government, as a percentage of GDP

	2006	2011	2012	2016
Deposits derived from IMF/EU loans	0.2	1.3	1.7	0.1
Private pension fund portfolio (without deposits)	0.0	2.1	1.7	1.7
MOL-shares		1.5	1.5	1.5

*Note: In making our estimate for the end-2012 stock of assets, we assumed the proposed foreign currency bond issues being taken up and partial use of the pension fund portfolio.*

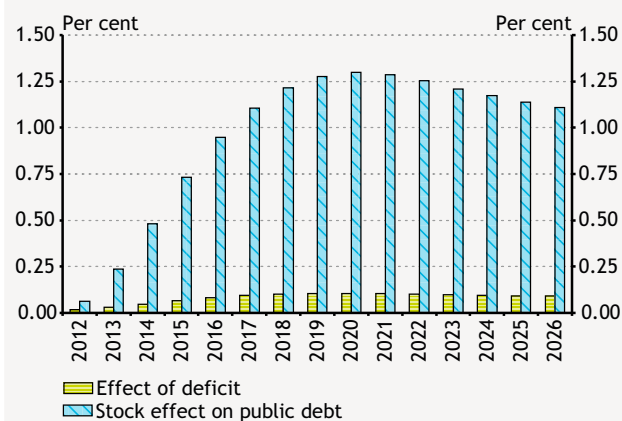
<sup>32</sup> Early repayment, on the one hand, lightens the interest burden on the general government, and on the other hand, the public debt is also reduced as the portfolio shrinks.



- To establish the volume of interest rate subsidy, we had to make assumptions in relation to the forward-looking interest rates of student loans. Pursuant to the effective government decree, the components of the interest rate must be determined in the same manner as in the case of Student Loan I (cost of funds, risk premium to cover the risk of default and risk premium to cover operating costs). For the future cost of funds we assumed that Student Loan II would be financed by issuing 3-year HUF bonds.

The measure affects the public debt through two channels: the deficit increases *ceteris paribus* due to the interest rate subsidy, and public debt rises due to the outstanding loan stock. The interest rate subsidy represents a gradually increasing current budget expenditure close to 0.1 per cent of GDP per year. The annual amount of the interest rate subsidies will fall below the savings achieved through the higher education reform in the first few years, and in 2017, due to the dynamic growth of interest expenditures, it may exceed such savings.

**Figure 20**  
Total effect of Student Loan II on the public debt



Note: Within the total effect, the interest rate subsidy is shown in the general government deficit, thus it affects the debt through the deficit.  
Source: MNB.

Student Loan I was not considered public debt, even though the government guaranteed the refinancing loans (i.e. provided a financing guarantee). The reasoning for this classification relied on the argument that the credit risk of this product is borne by the pool of borrowers through the default risk premium. In the case of Student Loan II, the interest rate on the loan is set at 2 per cent by law. Because of the interest rate subsidy, the facility will belong to the general government rather than to the sector of financial enterprises and the debt stock will be added to public debt. The credit stock outstanding in 2026, taking into account the repayments to have started by then, may correspond to 1.1 per cent of GDP.

### 4.5.3 Quasi-fiscal debt

For the projection of public debt, we made the simplifying technical assumption that the classic accrual-based general government deficit indicator covers all the activities of the government: thus, the deficit and debt paths always reflect “reality”, and there are no spikes in the indicators. We also assumed that the existing quasi-fiscal debt to be assumed at a later date (see Appendix 6.1) will not grow any further; instead, it will be rolled over and remain constant in nominal terms. The constant nominal debt gradually decreases as a percentage of GDP. Thus the assumption of the existing quasi-fiscal debt presents ever smaller risk for the debt ratio as time passes.

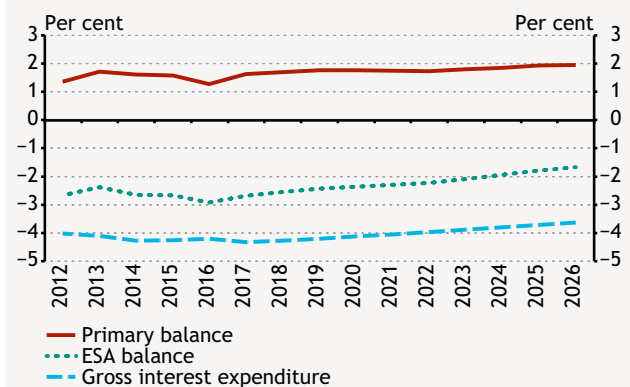
The value of quasi-fiscal debt at the end of 2011 is estimated to be 1.1. per cent of GDP. As a result of nominal GDP growth, this ratio will drop to 0.6 per cent of GDP towards the end of the horizon. Thus, if the government assumes this debt by the end of the projection horizon, the debt ratio may be 0.6 percentage point of GDP higher than in the baseline scenario.

### 4.6 DEFICIT AND DEBT PATH UP TO 2026

The ESA balance of the general government will remain below the 3 per cent Maastricht criterion throughout the period. The deficit may be the highest in 2016 (at 2.9 per cent of GDP), followed by a continuous decline, and consequently this indicator may sink to 1.7 per cent of GDP by 2026. The downward path of the deficit is attributable to the growth of the primary surplus on the one hand, and to the falling interest expenditures following from the smaller debt stock on the other hand.

**Figure 21**  
ESA balance of the general government

(per cent of GDP)

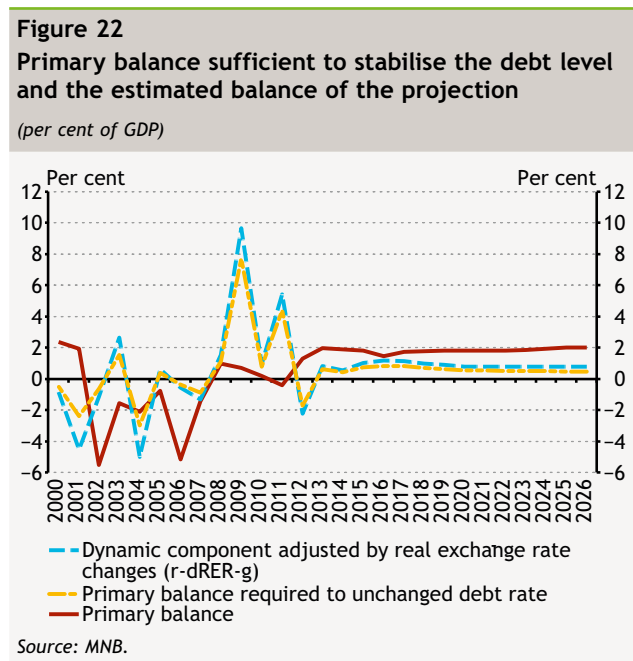


Source: MNB.

Based on the technical assumption of the macroeconomic trend and our estimate for the funding costs of the general government, this deficit results in a debt path declining steadily, albeit slowly, as a percentage of GDP. The relationship of the real interest rate on the debt, real growth and real appreciation with the primary balance has a major role in this process.

Despite the significant drop in the premium assumed, the long-term real interest rate on the debt may be around 3.6 per cent, which is 1.1 percentage points higher than our expectation for long-term real growth. On the other hand, the debt ratio is lowered by our assumption of a steadily positive, 1 percentage point inflation differential with an assumed stabilisation of the exchange rate, as a result of which the real exchange rate appreciates continuously. Taking into account the effect of real appreciation, the difference of the real cost of debt and real growth, which is important for the debt path, stabilises at 0.8 per cent in our projection. The combination of the high funding cost and low growth reflected in the indicator represents a substantial additional burden for fiscal policy.

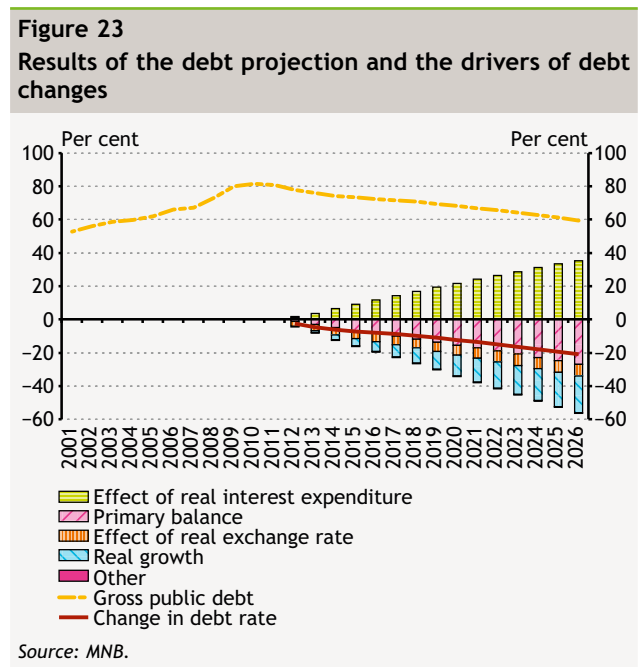
A primary balance ensuring that the debt ratio remains constant at any given debt level can be calculated for each value of the real interest rate-real output growth differential. A general government position that is more favourable than the primary balance sufficient to stabilise the debt results in a decline in the debt-to-GDP ratio. After 2012, the primary balance is higher than the level required for debt stabilisation over the projection horizon, which assures the continuous downward trend in the debt ratio.



With the substantial reduction in the risk premium and the near-stable HUF exchange rate, public debt will fall from 80.6 per cent to 59.4 per cent in the 16 years between 2011 and 2026. The decline is steady, but slow. The projection shows that the debt path satisfies the 60 per cent Maastricht debt target and the "one-twentieth" rule set in the Fiscal Compact, but the debt ratio will fail to meet the 50 per cent target specified in the Constitution even by the end of the period.

For the 2012–2016 period, the macroeconomic and fiscal assumptions are consistent with the Report on Inflation published in March 2012 and the outcome of the underlying modelling, while for the years after 2016 they can be considered as technical assumptions. Our projection contains no scenario analysis, and we have prepared no alternative debt path analysis relying on alternative macroeconomic assumptions, only partial sensitivity analyses.

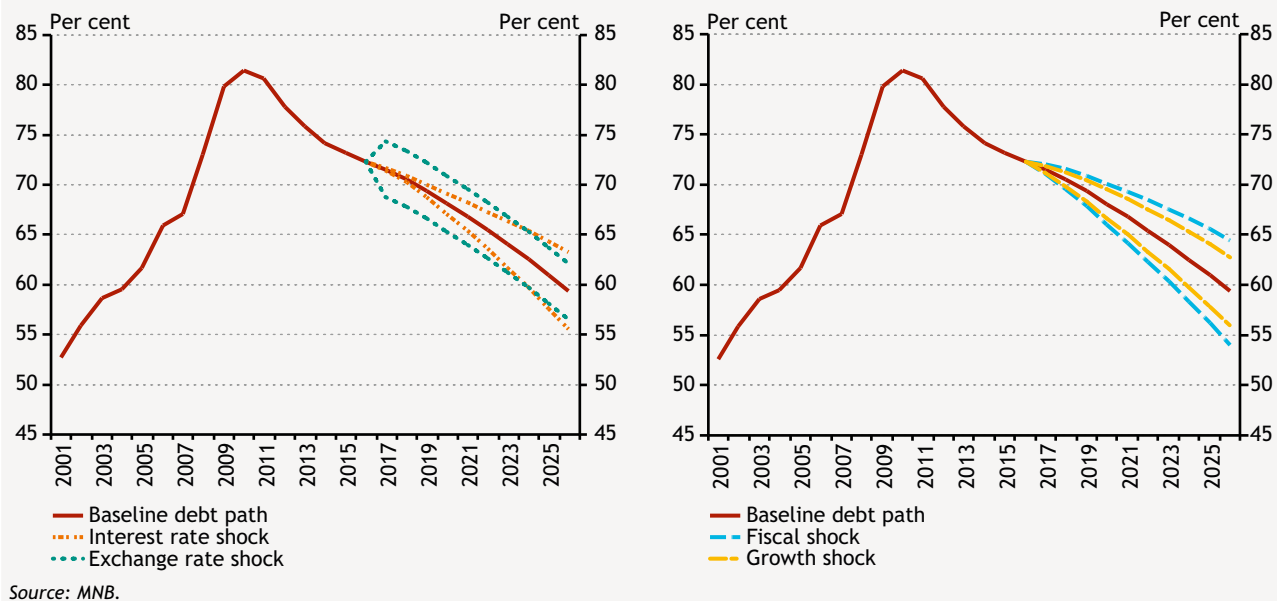
Because of the high initial level of debt, the growth path of the public debt is determined by the relationship between the interest rate on the debt and economic growth. Therefore, the permanent reduction of the debt ratio is dependent both on meeting the balance targets and the promotion of growth and improvement of investor perception.



### 4.7 SENSITIVITY ANALYSES

We ran sensitivity analyses for the key macroeconomic factors affecting the debt ratio. In the absence of sufficient long-term models, in the course of the sensitivity analyses

**Figure 24**  
Result of sensitivity analyses



we did not look at secondary effects or the interactions and feedback between variables. We examined the sensitivity of the debt ratio to the following factors:

- 0.5 per cent deviation in the rate of economic growth;
- a change in the primary balance corresponding to 0.5 per cent of GDP;
- a 100 basis point shift in the risk premium; and
- a 10 per cent change in the HUF exchange rate.

The size of the shocks is no indication of their expected magnitudes or typical historical values; their sole purpose is to illustrate the sensitivity of the debt path under plausible assumptions. Each shock was started from 2017 and assumed to remain unchanged over the horizon.

The exchange rate change is the only factor that exerts its full effect immediately because the HUF value of foreign currency debt is revalued instantly. A 10 per cent shift in the exchange rate would change the debt ratio by 2.9 per cent of GDP in 2017, and this would effectively remain constant over the projection horizon.

A 100 basis point change in the cost of funding would be reflected in the debt ratio more slowly, but to an increasing degree from year to year. Higher yields would raise the deficit and debt through interest expenditures, assuming an unchanged level of the primary balance, although the repricing of debt is gradual (Section 4.2.1) and therefore the effect is moderate in the initial years. However, there

is no cap on the change of debt, because if higher debt is financed at higher yields, the effect grows year from year, and it reaches 3.9 per cent of GDP after 10 years.

In our analysis, a 0.5 percentage point deviation in economic growth from the baseline scenario affects the debt ratio only through the denominator of the debt/GDP ratio. In reality, the acceleration or deceleration of growth has a substantial impact on the deficit, thus also on the nominal value of debt, but our partial analysis did not cover that phenomenon; consequently, the effect we measured amounts to 3.4 per cent in 2026.

A lasting 0.5 percentage point deviation of the primary balance of the budget starting in 2017 also has a continuously growing effect as compared to the baseline scenario. That is because the alternative debt path entails lower or higher interest expenditures, which is added each year to the effect arising from the primary balance. In one decade, the 0.5 per cent deviation would modify the debt path by 5.0 per cent of GDP, while the effect through interest rates represents an additional 0.2-0.3 per cent of GDP on the same horizon.

## 4.8 THE DEBT RULES RELEVANT FOR HUNGARY

We compared the public debt path with three debt targets:

- the 50 per cent target stated in the Constitution,

- the 60 per cent Maastricht criterion, and
- the “one-twentieth” rule implemented by the EU in 2012.<sup>33</sup>

The Financial Stability Act<sup>34</sup> supplements the debt rule of the Constitution with a debt formula that will have to be used for the 2016 budget and thereafter. According to the formula, the proposed value of the public debt in HUF terms must be determined so that its rate of growth over the previous year does not exceed the difference of the inflation rate expected for the fiscal year as specified in the budget act and half of the expected real growth rate of the gross domestic product.

The debt formula has the advantage of being simple and easy to quantify. The formula sets a cap on the HUF value of the government debt in the budget year; the maximum deficit

can be derived from this figure. While the interpretation of the rule for the budget of any given year is simple, its use in the baseline projection is problematic: the manoeuvring room of the government changes depending on the expected growth and inflation. In turn, the fiscal impulses arising from the compulsion to tighten or the ability to loosen fiscal policy feed back to macroeconomic developments, including the deficit as well as growth and inflation. Thus, the deficit ceiling derived from the debt formula also changes continuously. However, our baseline projection is unable to reflect such feedback. Therefore, in our projection we attempted to assume an unchanged fiscal policy, apart from the fiscal measures already decided, we have tried to reflect the effect of these in our macroeconomic projection up to 2016 as well. Because of the shortcomings in our approach, we are unable to examine the debt trend resulting from the debt formula in a consistent framework.

#### Box 5

#### Dilemmas relating to the debt formula defined in the Stability Act

While being simple, the debt formula raises some theoretical concerns: at times the rule requires procyclical fiscal policy and it may undermine the anti-inflationary commitment of the government.

The debt formula only takes into account the rate of economic growth, but not the cyclical position of the economy. Thus we may have a scenario where the formula requires fiscal tightening in the environment of a negative output gap and economic growth below the 2 per cent potential level. For instance, if a small, positive growth rate emerges after a long period of recession, in an economy operating far below its potential. In such cases, the continuation of fiscal stimulation may be called for while the rule demands immediate fiscal tightening, which may have an adverse effect on the emerging recovery. Similarly, there may be cases in which the rule allows the deficit to increase if the output gap is positive and growth is above its potential.

The other dilemma relating to the debt formula is that higher inflation facilitates a higher deficit. This may undermine the commitment of the government in the future to reduce inflation and may increase the pressure on monetary policy. Based on the results of our simulation, with an initial debt level of 80 per cent and a growth rate of 2 per cent, a 1 percentage point increase of inflation would loosen the deficit criteria consistent with the rule by 0.8 percentage point.

By contrast, the positive bias to inflation expectations also broadens the fiscal manoeuvring room, even if actual inflation turns out lower than envisaged. That is because during the implementation of the budget there is no mechanism imposing a clear obligation to amend the budget during the year. The half-year review required in the Stability Act applies to the debt rule rather than the debt formula. Accordingly, it requires no adjustment measures as long as the expected public debt declines by at least 0.1 percentage point.

## 4.9 DIFFERENCE OF THE DEBT RULE AND THE PROJECTION – THE “FISCAL GAP”

In the following, we present the magnitude of fiscal balance improvement required to assure the attainment of the debt target specified in the Constitution assuming all else, i.e. long-term interest rates and growth, remains equal. This is

the indicator known as the fiscal gap, which captures the fiscal adjustment required to attain the debt targets over a given time horizon. It is a useful indicator of the tensions between debt targets and the results of the debt projection.

It should be noted, however, that if appropriate economic policy instruments are used, a faster reduction of debt may result from the lower funding costs or improving growth

<sup>33</sup> The application of the rule is not automatic: compliance is assessed on a case-by-case basis, on the average of 3 years.

<sup>34</sup> Act CXCIV of 2011 on the Economic Stability of Hungary.

**Table 8**  
**Fiscal balance improvement required to achieve the debt target of the Constitution**

(per cent of GDP)

	Average primary balance between 2016–2026	Debt target in 2026: 50 per cent	
		Measure of required adjustment	Average primary balance after the adjustment
	GDP %	GDP %	
Persistent adjustment in 2017	1.9	0.9	2.8
Persistent adjustment in 2020	1.9	1.3	3.2
Gradual adjustment between 2017–2026, annual average	1.9	0.2	2.8

prospects, i.e. the “gap” does not necessarily have to be “plugged” with tighter fiscal policy.

The definition of fiscal sustainability provides that the government can meet its future obligations, meaning that the government does not cross the intertemporal budget constraint: the present value of net public debt and the future obligations of the government does not exceed the present value of expected revenues. If this is not the case, the intertemporal budget gap is captured by the immediate and lasting adjustment required. The size of the primary balance required for the adjustment is determined primarily by the difference in the real interest rate on the public debt and the rate of economic growth: the higher the real interest rate compared to the growth rate, the greater the need for adjustment.

Despite its theoretical foundations and general acceptance, the intertemporal budget constraint as an indicator has its drawbacks: it relies on the assumption that the government wishes to eliminate all of its debt, and it is generally applied on an infinite horizon. The adjustment requirement for an infinite horizon is difficult to translate into medium-term economic policy measures, particularly as this allows governments to postpone adjustments claiming that a future positive revenue shock would occur after their term.

Because of these problems, we capture the results of the projection through a medium-term fiscal gap calculated for a finite period, ending in 2026 in our case. We present the fiscal gap in three different ways depending on whether (a)

the fiscal adjustment occurs immediately (in 2017) or (b) three years later, and (c) the size of gradual adjustment steps necessary between 2017 and 2026 to attain the 50 per cent debt target by 2026.

The difference between the first two indicators highlights the “price” of the timing of economic policy response to the problem, while we show the third indicator because fiscal tightening is not necessarily undertaken in a single step such as the imposition of new taxes, the increase of tax rates or tax bases in one go or certain expenditure cuts, but may also occur gradually. Examples include the indexation of certain appropriations or transfers to household, the trend of which lags behind potential growth, or the regular lagged adjustment of the brackets of a progressive tax.

Based on our medium-term baseline projection, which relies on the recent fiscal measures, cautiously optimistic growth and yield expectations and the assumption of constant policies, Hungarian public debt has assumed a path of slow but steady decline. The debt achieved in the baseline scenario by 2026 meets the Maastricht debt criterion, but exceeds the debt target of the Constitution, while the result of the projection is very sensitive to any growth, exchange rate, fiscal or yield shock in the next 15 years. The slow reduction of the debt ratio calls attention to the fact that the economic strategy needs to assign priority to improving the risk perception of Hungary and the conditions of long-term growth as well as a balanced fiscal policy producing a significant surplus in the primary balance.

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# 6 Appendices

## 6.1 ALTERNATIVE INDICATORS OF THE FINANCIAL POSITION OF THE GENERAL GOVERNMENT

When assessing the medium-term position of the general government, information about the past is particularly important: on the one hand, the initial financial debt and asset stock as well as commitments undertaken in the past but relating to the future have a significant effect on the future trajectory of public debt, and on the other hand, the “inheritance”, the level and changes in physical assets may be an important cornerstone for the definition of unchanged fiscal policy. In this section, we describe the past mostly through stock type variables disclosed in the balance sheet of the general government. It should be noted, however, that the broader the coverage we try to achieve, the less reliable the statistics are, and data may be available only with significant delays.

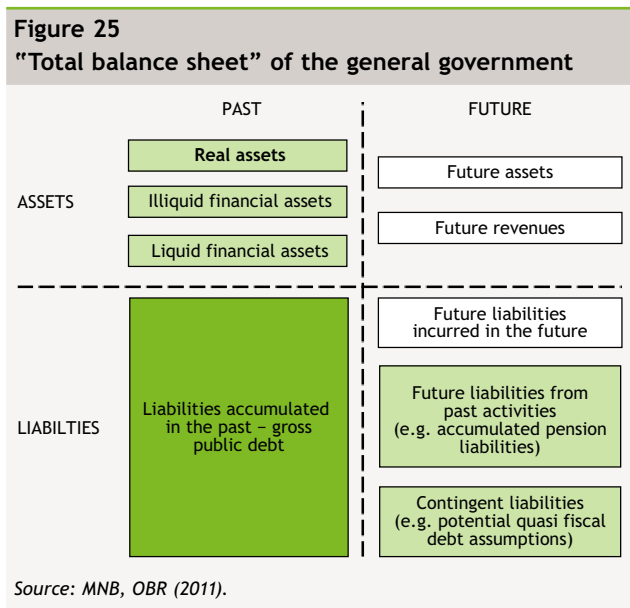
*Gross public debt* plays a prominent role in the assessment of the vulnerability of a country and the sustainability of its

fiscal policy. The indicator is part of the Maastricht criteria and it is central to the set of rules recently adopted by the EU. The fiscal rule set laid down in Hungary in the Constitution and in the related Financial Stability Act in 2011 also relies on gross national debt. However, the central role of the gross debt ratio is due to the fact that it is easy to produce, it is not distorted by valuation issues, it is more or less unequivocal, consequently, it is available for a number of countries. On the other hand, in terms of economic content, indicators that also take into account the assets of the general government provide a more comprehensive picture of the position of the budget.

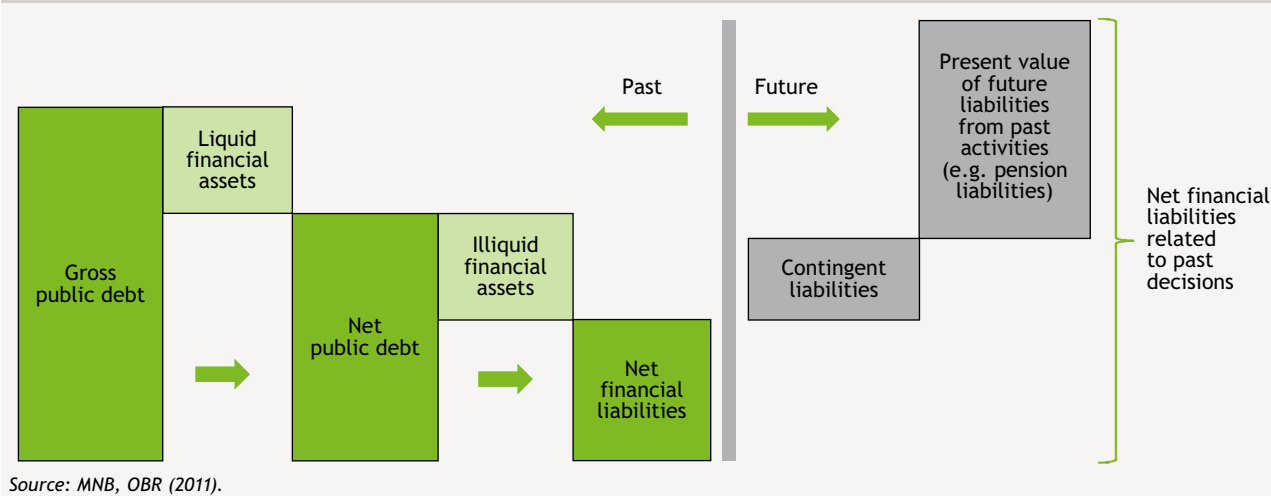
In addition to the gross public debt, i.e. financial liabilities accumulated in the past, the general government also has more or less liquid financial assets. Financial assets are kept primarily to assure the continuous and secure financing of the public debt and the deficit. During times of financial turbulence, in order to reduce the risk of financing, the debt manager may decide to increase the level of liquid financial reserves. The elevated level of financial assets boosts gross debt. The lowering of liquid reserves may play a role in reducing the debt ratio. Consequently, in some countries the fiscal rules are based on the net *public debt ratio*, which is generally defined as the difference between gross public debt and the liquid assets of the government.

In the second half of the 1990s, the use of privatisation proceeds to pay off debt played a major part in the development of gross public debt; then after the turn of the century, due to the steadily high deficit, both gross and net debt started on a steep climb (for the trends driving changes in the gross debt, see Section 2.2.).

Taking into account the full scope of financial assets and liabilities, we can quantify the *net financial liabilities* of the general government (financial accounts), which corresponds to the difference of the total stock of financial liabilities and assets. It should be noted, however, that the overwhelming majority of illiquid financial assets is given by



**Figure 26**  
Debt and liability indicators of the general government under different approaches



the participation of the general government in undertakings performing public functions,<sup>35</sup> that is, they may not serve as cover for a debt falling due in the future, and hence they may not be the source of reducing the gross debt ratio.

In the second half of the 1990s, the decline of public debt ratios was accompanied by a continuous increase in the net financial liabilities of the government. That is because the privatisation of state property played a major role in the reduction of net and gross public debt, resulting in a fall in the equity capital of the general government. From the early 2000s, the debt and liability ratios have been following a parallel, rising course. In that period, the increase of debt and liabilities was driven mainly by the high general government deficit. In 2011 Q1, the net financial liabilities dropped significantly, by close to 10 per cent of GDP, which is related to the acquisition of the pension fund portfolio by the government. A significant part of the pension fund assets were held in less liquid securities, and therefore the decline in net public debt was considerably exceeded by the decrease of net financial assets.

Capturing the *physical assets* of the general government can be an important tool for assessing both the past and the expected developments.<sup>36</sup> The net state-owned physical asset stock, i.e. net of depreciation, mostly consisting of

real property and machinery, sank from 137 per cent of GDP in the second half of the 1990s to 111 per cent as the average of the last 5 years (2005–2009). This contraction in physical assets results from the intentional downscaling of the role of the state as an owner, as well as the permanent low level of public investments below the estimated rate of depreciation. If the state decides to maintain the current level of services, a substantial increase in investment expenditures will be required to retain the value of state-owned physical assets (see Chapter 3).

The indicator covering the entire balance sheet of the general government is the net worth of the state, which can be defined as the difference of total assets (financial and physical) and liabilities. Unfortunately, we are unable to accurately quantify the net worth of the general government. Even though the CSO does publish annual figures on the stock of physical assets of the state, we have no information on non-produced tangible assets (e.g. land, rights and titles, etc.). Consequently, we estimated the historic development of net worth based on partial data. As a result of the continuously decreasing net physical asset stock and increasing financial liability stock, the *net worth* of general government as a percentage of GDP decreased from above 100 per cent of GDP to around 60 per cent and then stabilised at that level.

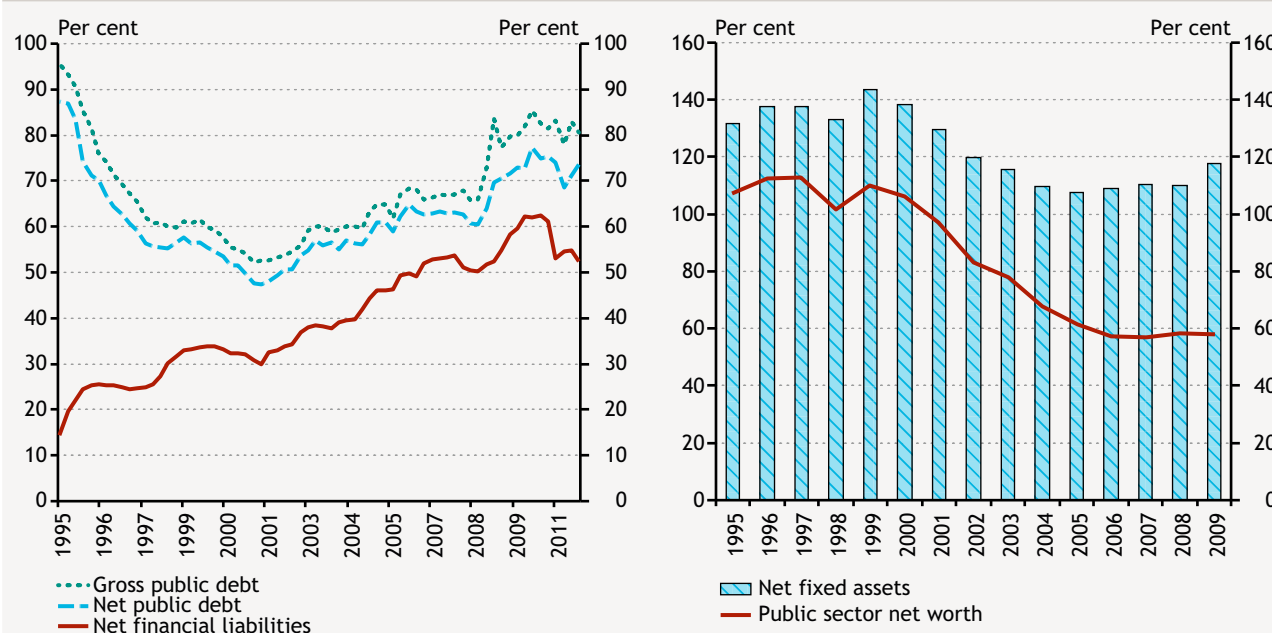
<sup>35</sup> So-called quasi-fiscal companies, which perform fiscal functions and are state-owned, may cause considerable distortions in the deficit and debt statistics of the general government. If these companies make a loss and they finance it through the private sector, the loss, i.e. deficit, effectively related to fiscal functions and the debt accumulating as a result may remain outside the standard general government statistics for years. When the accumulating debt reaches a level that it can no longer be financed from the market, the government decides to assume the debt, bringing the accumulated losses into the deficit and debt. In order to record such explicit or implicit government commitments transparently and simultaneously with the treatment of losses, the statistical authority of the United Kingdom decided to quantify the deficit for the entire scope of the general government including quasi-fiscal corporations. Thus the financial liabilities and assets of such companies are also included in the gross and net public debt of general government.

<sup>36</sup> Annual data on the net and gross physical asset stock is published by the CSO (latest figure from 2009).



**Figure 27**  
Debt and liability indicators of the general government

(per cent of GDP)



Note: In the case of gross public debt, liabilities embodied in securities are recorded at nominal value in accordance with EUROSTAT methodology. Financial accounts, on the other hand, present financial assets at market value; thus the exchange rate fluctuations of securities cause variations in the public debt disclosed in the financial accounts. Due to the difference in methodologies, the public debt indicators and net financial liabilities cannot be compared directly, whereas the difference in methodologies has no impact on trends and does not affect the overall picture. The net public debt is defined as the difference of the Maastricht gross public debt and the liquid financial assets of the general government. Liquid assets include cash, deposits, securities other than shares and short-term credit instruments.

Source: MNB, Financial accounts; CSO.

The indicators explained above present the results of the past operations of the budget based on the assets and liabilities disclosed in the general government balance sheet. However, fiscal policy decisions adopted often result in commitments that “materialise” in the future. Such future liabilities may arise from explicit or implicit undertakings relating mostly to quasi-fiscal operations, and have left a visible trace on both deficit and debt development in the past. Similarly, the pension payment liability relating to pension contributions already paid also represents commitments for the future, which will become part of general government statistics in the future.

The overwhelming majority of the accumulated debt of so-called quasi-fiscal corporations that perform public functions but are outside the government sector is accounted for by the debt of MÁV and BKV, amounting to 1.1. per cent of GDP at the end of 2011. Based on historic tendencies, the government will in time assume that debt, and thus it will appear in the deficit and public debt.

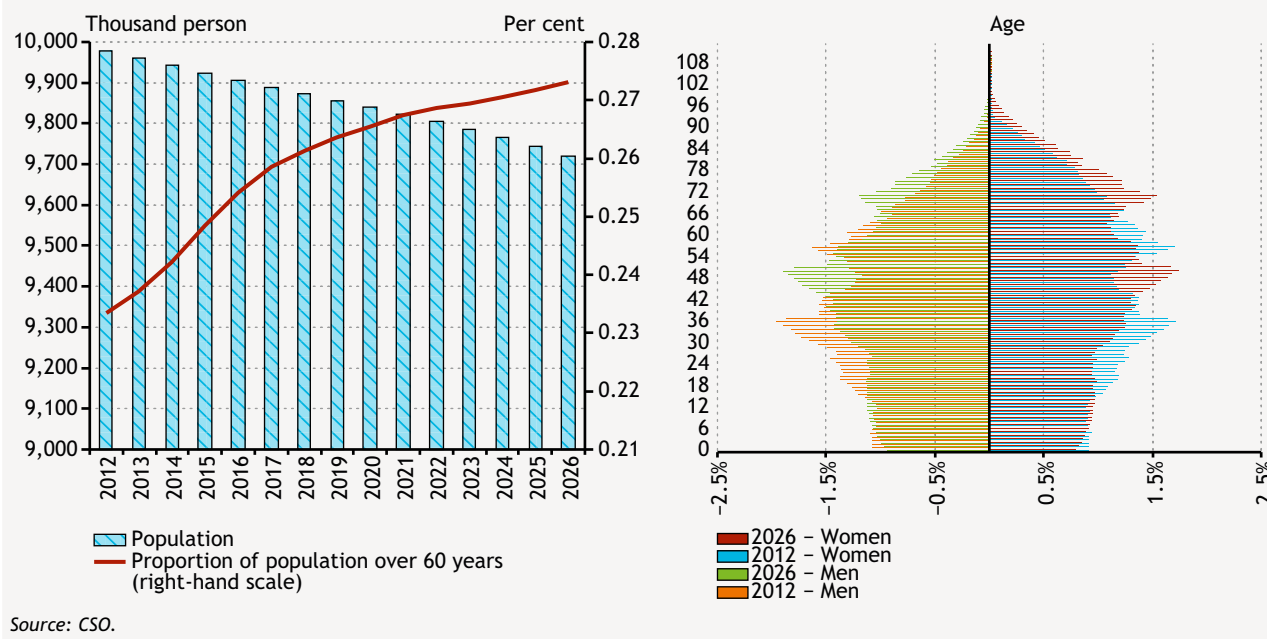
In respect of future commitments arising from past operations, the retirement benefits owed based on accrued entitlements, or rather their present value, deserve special

attention. This indicator can be considered as a liquidation value of sorts: it shows the magnitude of payment that the government would need to make to redeem the accrued benefits of present and future pensioners if the state pension system were to be abolished. In the case of Hungary, the gross and net liabilities are identical as the general government has no reserves to cover commitments falling due in the future. According to preliminary calculations, the implicit pension liability calculated as described above, at a discount rate of 3 per cent, corresponded to 215 per cent of GDP in 2010 assuming the present behaviour patterns remain and using the assumptions of the Ageing Working Group (EC, 2011a) for growth and wage development.

## 6.2 DEMOGRAPHIC CHANGES

The expected development of the Hungarian population has three important characteristics: the decline of the total population due to the low birth rate below the replacement level, the growing ratio of the elderly – in other words the ageing of society – and the fluctuation in the age structure and the total population, explained by the echo of earlier demographic events (“Ratkó era”,

**Figure 28**  
**Number of population and ratio of elderly, 2012–2026**



introduction of family and child benefits) recurring from generation to generation.

While the first two phenomena are present in most developed countries, the wide fluctuations in the population is not a necessary element of economic growth and is often restricted to the echoes of high post-war birth rates. In this respect, the position of Hungary is special as fluctuation is high, creating tensions in those subsystems of the general government which are directly affected by demographic characteristics.

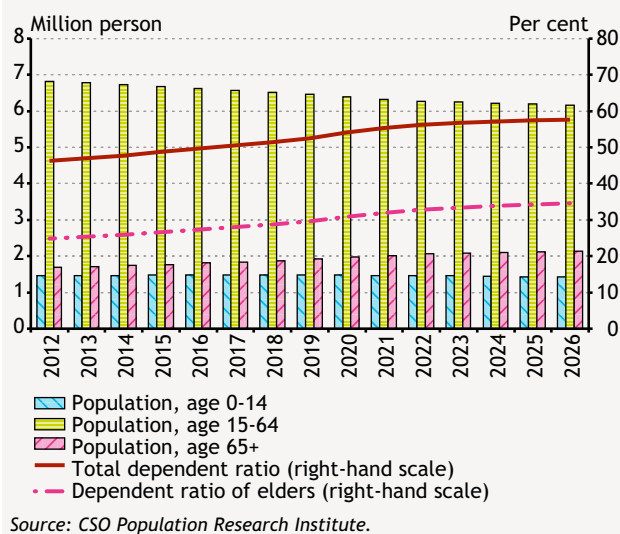
Mention should be made of the effects of international migration. In term of migration, there are countries of net outflows, net inflows and transit countries. Determining which group a certain country belongs to is difficult based on administrative data, partly because of the lack of clarity around concepts relating to migration and change of residence, partly due to the limited reliability of international databases and partly as a result of the difficulties of linking and consolidating international data. The forward-looking calculation of the population is deterministic in the sense that it only takes into account the observed trends of fertility, mortality and migration while it contains no behavioural responses (for instance to family benefits, net household income or student quotas); thus it is unsuitable for the sensitivity analysis of the demographic effects of measures.

For the analysis, we have used the demographic projection prepared by the CSO Demographic Research Institute, which

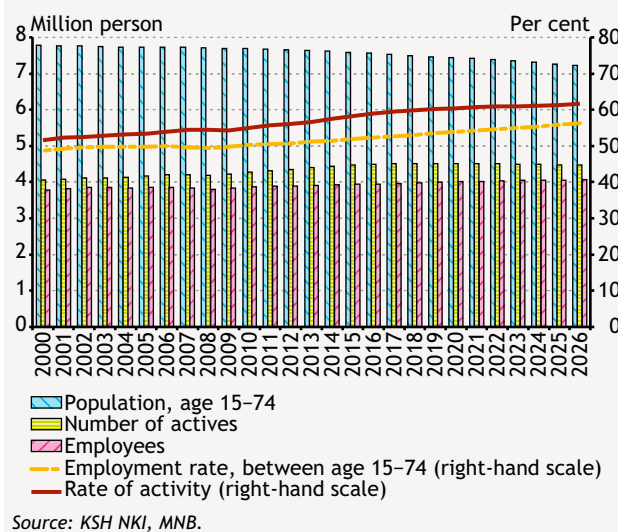
does not yet incorporate the corrections to reflect the data from the 2011 census. On the horizon of the analysis, the decline and ageing of the population continues: total population will fall from 9.98 million to 9.72 million, and the ratio of persons between 20 and 59 years of age will decline from 56.3 per cent in 2012 to 52.9 per cent, a drop of 476,000 persons. The number of persons above 60 will increase by 325,000, or 4 per cent of the total population, between 2012 and 2026, with the old-age dependency ratio increasing from the current 0.25 to 0.35. The total dependency ratio will deteriorate at a lesser degree, from 0.46 to 0.58, as the drop in the number of young persons partly offsets the increased ratio of the elderly. However, the two trends entail risks of different magnitudes and character: while the increased number of the elderly raises at a similar rate as the number of persons having no or only a partial presence on the labour market and thus relying on transfer income (pension and social benefits), the ratio of young persons participating in full-time post-secondary education continues to grow even as the ratio of young people declines. Thus, the ratio of young dependants within the population declines to a lesser extent and may even grow, despite the underlying demographic trends.

In the long term, the effects of the changing age composition will primarily be felt in the shrinking participation rate, which is coupled with the cost implications of the pension payments and healthcare services to the inactive elderly. The long-term negative impact of the lower revenues and higher expenditures resulting from lower participation can be mitigated primarily by improving the age-specific

**Figure 29**  
Dependency indicators



**Figure 30**  
Growing participation rate and employment



productivity and health status: on the one hand, any further increase in the retirement age, even if the average life expectancy at retirement remains constant, can be successful only if there is demand for the skills of those remaining in the labour market, and on the other hand, the drop in the number of the active age population is partly offset by efficiency improvements. These trends highlight the importance of professional education and retraining, adult and life-long learning as well as the importance of an economic structure taking into account the changing age composition.

### 6.3 ASSUMPTIONS CONCERNING THE LABOUR MARKET

The starting point for the labour market projection is the number and age composition of the population. According to the central estimate of the CSO Demographic Research Institute, the number of persons between 15 and 64 years of age will fall by 9.5 per cent, or a total of almost 600,000 persons, between 2012 and 2026. The participation rate of the working-age population can be approximated fairly well on the basis of gender and schooling. The higher ratio of persons with higher qualifications raises the participation rate of the working-age population over the entire projection horizon. The improved participation rate can offset the effects of the shrinking and the changing composition of the population until approximately 2020, that is, the number of economically active persons will

increase until then, and start to decline slightly in the six years to follow.

In the long run, the participation rate cannot be derived automatically from the qualification profile as the partial inflation of qualifications over time needs to be taken into account. However, we did not take into consideration this constraint on the projection horizon, because of the relatively low ratio of people with higher education qualifications and the slow pace of change in the enrolment structure.

Another component of the labour market projection is the natural rate of unemployment, which we assume to be stable in the long run – disregarding the short term effects of one-off measures – its equilibrium level being identical with the average unemployment rate between 1997 and 2007. We assume that the current high unemployment will return to the former average level by 2025–2026. This rate of decline of long-term unemployment is the same as the one assumed by the Ageing Working Group (EC, 2011a).

Because of the growing activity rate and falling unemployment, employment increases continuously over the projection horizon, by approximately 240,000 persons. The gravity of the labour market problems is shown by the fact that Hungary will reach the EU27 employment rate of 2010 by 2026 with these rather optimistic participation and employment assumptions.

## 6.4 PUBLIC HEALTHCARE EXPENDITURES: METHODOLOGY AND MEASURES TAKEN INTO CONSIDERATION

In our medium-term outlook, we adopted the definition of the OECD for public healthcare expenditure<sup>37</sup> (Figure 31). Within the expenditures of general government defined accordingly, approximately 85 per cent of current (operating) expenditures is accounted for by the expenditures of the Health Insurance Fund (Health Fund). However, the remaining portion of operating expenditures as well as all government investment in the sector (barely 3 per cent of health expenditures in 2011) is financed directly by the central government and local governments.<sup>38</sup>

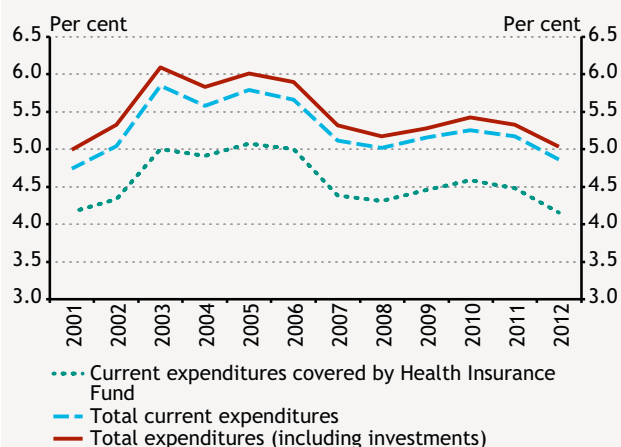
As a substantial part of health expenditures is discretionary or determined by capped budgets in the short term, we quantified some two thirds of the expected health expenditures of 2012 in accordance with legal appropriations. We prepared our own estimate for pharmaceutical subsidies (including the free medication to the needy). The items of current expenditure financed by

sources other than the Health Fund which are difficult to accurately identify have been estimated based on the Budget Act or in line with the nominal expenditure trends of curative-preventive care, following the observed trend of the item group.<sup>39</sup> For methodological considerations, we treated investments in healthcare separately over the projection horizon, as we forecast the volume of public investments on an aggregate level. Within this, we assumed that health-related investment expenditures will grow at the rate of government investment growth, with the exception of the 2014–2016 period, when we allocated some of the aggregate investment increase as a proportion of GDP to the healthcare sector.

Starting from the basis determined in this manner, we made the simple assumption that public health expenditures will follow a *growth path that assures the maintenance of the present (relative) standard of service*. Thus, we have not included the effect of technological innovation or any change in the existing institutional or financing arrangements. In numerical terms, if the expenditure path develops as we expect, per capita public health expenditure will grow at the rate of the trend growth of GDP per capita. In the case of a zero output gap and a demographically homogeneous population, this relationship results constant health expenditures in proportion to GDP (irrespective of any changes in the number of population). This baseline scenario, however, is modified by three factors:

- i. *Government measures* will divert the assumed expenditure trend from the baseline path. The volume of expenditures estimated for 2012 already reflects substantial fiscal adjustment in this sector. Without the planned wage increase, the GDP-proportionate public health expenditures may decline by 0.3 percentage point from the 2011 level, which results in the lowest expenditure level of the past decade (Figure 31). Of that drop, 0.2 percentage point relates to pharmaceutical subsidies. Together with the additional effects of the Structural Reform Programme 2.0, we project pharmaceutical expenditures declining in nominal terms again in 2013. Furthermore, we also included in our projection for 2013 the nominal freeze of earnings for both direct sectoral labour costs and the costs of services provided by private entities (e.g. family doctors).

**Figure 31**  
Public health expenditures  
(per cent of GDP, 2001–2012)



Notes: 1. GDP-proportionate expenditures were quantified based on the GDP data retroactively amended by the CSO. 2. The 2012 figures show our baseline projection calculated without the additional effects of the wage correction and the Structural Reform Programme 2.0.  
Source: 2001–2009: OECD; 2010–2011: nowcast; 2012: MNB projection.

<sup>37</sup> The OECD definition is methodologically more detailed to reflect the specifics of the sector than the COFOG based classification covering all government functions. Hungarian public healthcare expenditures calculated on the OECD basis are some 0.2–0.3 per cent of GDP higher than the COFOG level because of the more comprehensive coverage.

<sup>38</sup> Items financed by sources other than the Health Insurance Fund include, inter alia, free medication to the needy, various prevention programmes, sectoral administration costs, expenditures of budgetary institutions not financed by the National Health Insurance Fund (HNIF) (e.g. National Public Health and Medical Officer Service, National Blood Transfusion Service), supplementary transfers to healthcare institutions and employees as well as the cost of healthcare services provided in social institutions.

<sup>39</sup> This procedure was meant to identify the healthcare expenditures that serve as the projection basis within the various subsystems of the general government, thus it had no direct effect on our calculation of the balance for 2012.

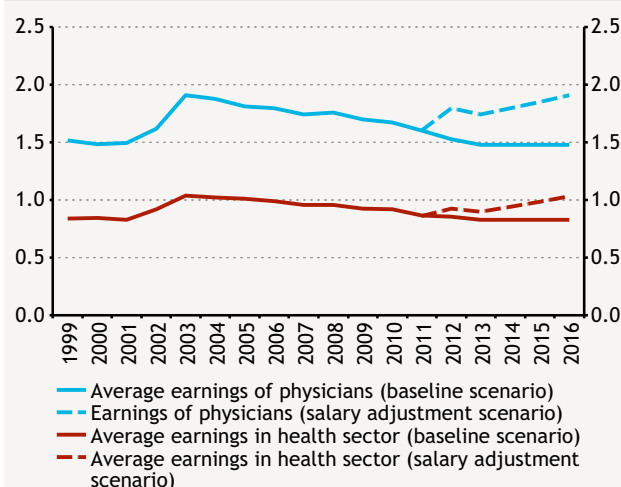
ii. Additional expenditures may be needed even to simply *maintain the present standard of service in the medium term*. Given the liberalised EU labour market, the wage tensions in the sector may lead to a destabilising lack of medical personnel. In order to mitigate the problem, the Government has announced a partial sectoral wage adjustment scheme for this year in the gross amount of HUF 30.5 billion. In addition, we incorporated in our projection further wage increases between 2014 and 2016. Simultaneously with the wage adjustment, and based on similar considerations of alleviating tensions, we assumed an adjustment in the expenditures of the sectoral asset accumulation and replacement, resulting in a relatively modest increase in the investment level in absolute terms.

iii. Per capita public health expenditures are different by age group and sex, thus the *change in the demographic composition of the population*, typically the shift of the age profile towards higher ages, results in pressure on expenditures. This relationship is easiest to integrate into the expenditure rule we adopted if we assume that per capita health expenditures follow the per capita trend GDP growth rate for every demographic group. We quantified the demographic effect using the demographic index (indices) measuring the change in the per capita health expenditures weighted for age group and gender based on, or extrapolating from, the demographic information obtained from the social insurance data available.

### 6.4.1 Wage adjustment in healthcare

The state-financed healthcare sector has shown aggravating wage tensions particularly since the second half of the 2000s. This is clearly shown by the ratio of gross salaries in healthcare to the average in the national economy. While as a result of the wage increases at the beginning of the previous decade, in 2003 gross average salaries in the healthcare sector exceeded the average of the national economy by 3 per cent, in 2011, based on the preliminary actual figures, they were 14 per cent below that level. The same ratio for doctors in employment was 1.91 in 2003 and only 1.6 in 2011. Given the salary freeze of 2012–2013 announced in the convergence programme and in the absence of any other measures, the relative level of salaries in healthcare may sink to its lowest level.

**Figure 32**  
Ratio of average gross salaries in healthcare and the salaries of medical doctors to the average in the national economy



Notes: 1. The figures relate to full time employees. 2. In the case of the baseline scenario, apart from the wage compensation to public servants due to the phase-out of the tax credit (and adjusted for the one-off payments of 2011), we project salaries being nominally unchanged in 2012 and 2013, followed by a growth rate identical with the average in the national economy.

Source: 1999–2011: GYEMSZI.

The situation is similar in the entire public sector, but the functioning of the healthcare sector is particularly jeopardised by the fact that the EU labour market presents a realistic exit option for doctors and other healthcare workers.<sup>40</sup> According to international data available, the salaries of Hungarian doctors and health care professional as a percentage of the national economy average is significantly below the EU average and the income of their peers working in Member States on a similar level of development (Table 9 and Table 10). The gap would be even wider if the calculation was based on purchasing power parity.

Taking into account all these circumstances, we assumed that assuring the human resources necessary to maintain the standards of service requires, in the medium term, at least the restoration of the relative wage level seen in the health sector since the transition. This assumption can be considered to be rather conservative: even with a wage adjustment of that magnitude, relative Hungarian healthcare salaries would not catch up with the average of the ex-socialist countries that joined the EU in 2004.<sup>41</sup>

<sup>40</sup> According to the records of the Office of Health Authorisation and Administrative Procedures, 1,901 healthcare workers applied for and received regulatory certificates required for employment abroad in 2011; this represents an increase of close to 70 per cent over the corresponding figure 5 years earlier (1,148 persons).

<sup>41</sup> It should be noted that the significant salary increases implemented recently in the benchmark countries are not yet reflected in the international statistics available. For instance, the salary increase programme launched in the Czech Republic aims to increase the salaries of doctors to three times the national average in the medium term. In Slovakia, the salaries of doctors were increased by 300–500 EUR per month while the salaries of healthcare professionals were increased by 25 per cent this year. These developments are responses to labour market challenges similar to the ones faced by Hungary.

**Table 9**  
Salaries of Hungarian doctors in international comparison: salaries as a proportion of average national wages

	Ratio of wages	Year
Czech Republic	1.85	2009
Denmark	2.67	2009
United Kingdom	2.64	2009
Estonia	2.15	2009
Finland	2.59	2009
Greece	2.75	2009
Netherlands	2.89	2008
Ireland	3.79	2008
Germany	2.46	2006
Italy	2.61	2009
Slovenia	2.81	2009
<b>EU average</b>	<b>2.66</b>	
<b>Average of new member states</b>	<b>2.27</b>	
<b>Hungary</b>		
Employed medical doctors*	1.60 (1.55)***	2011
Specialists**	1.68 (1.63)***	2011
<i>memo: targeted level of wages</i>	1.91	

\* Including senior executives with medical qualifications.

\*\* Specialist physicians by FEOR code.

\*\*\* The figures in parentheses show the average income including fringe benefits as a ratio of labour income in the national economy.

Source: OECD, GYEMSZI.

**Table 10**  
Salaries of Hungarian healthcare professionals in international comparison: salaries as a proportion of average national wages

	Ratio of wages	Year
Czech Republic	0.99	2009
Denmark	1.08	2009
United Kingdom	1.10	2009
Estonia	1.02	2009
Finland	0.97	2009
Greece	1.04	2009
Netherlands	0.96	2008
Ireland	1.04	2009
Luxemburg	1.43	2009
Germany	1.17	2006
Italy	1.06	2009
Slovakia	0.89	2009
Spain	1.29	2009
Slovenia	1.05	2009
<b>EU average</b>	<b>1.08</b>	
<b>Average of new member states</b>	<b>0.99</b>	
<b>Hungary</b>		
Skilled medical personnel	0.80 (0.79)*	2011
Hospital personnel and nurses	0.81 (0.80)*	2011
<i>memo: targeted level of wages</i>	0.96	

\* The figures in parentheses show the average income including fringe benefits as a ratio of labour income in the national economy.

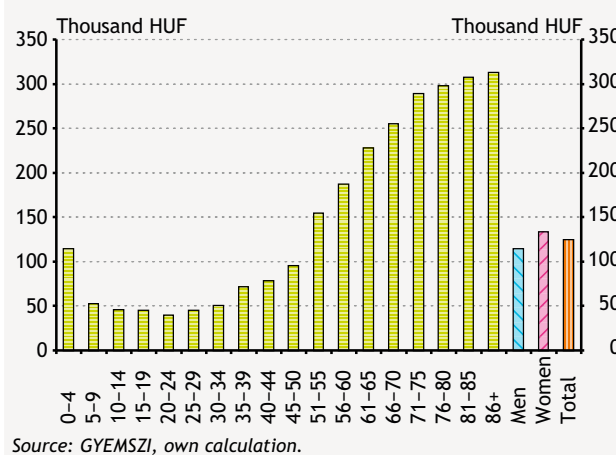
Source: OECD, GYEMSZI.

For technical reasons, we closed the gap between the targeted salary level and the baseline scenario excluding the wage adjustment by 2016, evenly distributing the difference remaining after the wage adjustment of 2012 in the period between 2014 and 2016. Taking into account the erosion caused by the wage freeze of 2013, the sectoral wage increase of HUF 30.5 billion proposed for this year will work off about one third of this gap in respect of all employees working in the healthcare sector, whereas the same ratio for medical doctors in *employment* is approximately 60 per cent. The wage increase of 2012 can be considered partial also in the sense that it does not apply to all healthcare workers, for instance it does not cover physicians in entrepreneur status participating in publicly financed service provision or their employees, nor healthcare professionals working as entrepreneurs. If the wage adjustment is extended to these groups, the additional measure we applied constitutes some three fourth of the total cost of the entire wage adjustment and its effect on the primary balance amounts, *ceteris paribus*, to almost 0.15 percentage points of GDP.

### 6.4.2 Demographic index

The demographic effect on healthcare expenditures was estimated using the *patient flow data* on social insurance services broken down by financing events. We should note that from the viewpoint of service providers this reflects the revenue side while expenses actually incurred cannot be observed with similar accuracy. For three fourths of the in-kind services of the Health Fund (active and chronic inpatient care, secondary outpatient care, laboratory budget, dental care as well as pharmaceutical subsidies), the breakdown by age group and gender of the expenditures calculated from the 2010–2011 patient flow reports is available from the GYEMSZI (National Institute for Quality and Organisational Development in Healthcare and Medicines) IRF database.<sup>42</sup> In respect of the remaining services, we relied on the National Health Insurance Fund data, with similar content, on the financing year of 2004, partly using data of 2010–2011 as proxy.<sup>43</sup> For these figures, we calculated the expected value of per capita expenditures projecting the figures on the ratio of the various demographic groups within the population and adjusted to the *nominal healthcare expenditures* estimated for 2012. Figure 33 shows the distribution of the per capita

**Figure 33**  
Age profile of the per capita in-kind expenditures of the Health Insurance Fund, 2012



expenditure on the total in-kind benefits financed from the Health Fund by age.

As the next step, we projected the per capita expenditures for the *entire population*, fixing the per capita expenditures of the various demographic groups by gender for 2012 (i.e. treating them as having constant expenditure weightings over time) and weighted these values with the breakdown of the population in the given year. The chain index of the weighted averages thus derived, the “demographic index of healthcare”, shows the effect, *ceteris paribus*, of changes in the demographic composition of the population from one year to the next on the expected per capita expenditures. Figure 31 illustrates the cumulative changes of that effect for current public health expenditures, with 2012 as the reference year.

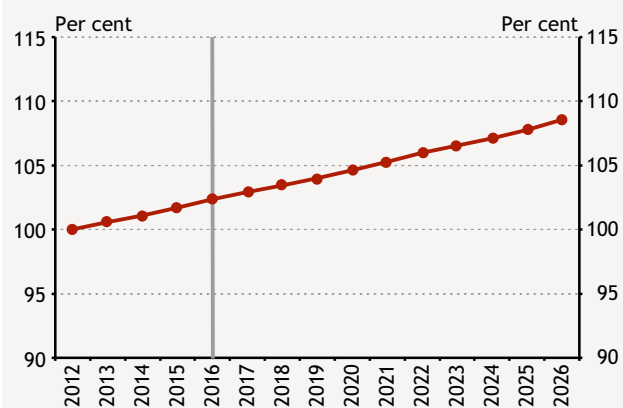
If we also assume that in a dynamic economy the per capita expenditures grow by the multiple of per capita GDP and the demographic chain index this cumulative index<sup>44</sup> can be also interpreted as the percentage change of GDP-proportionate healthcare expenditures. For example, the value of the cumulative index calculated for 2026 is 108.5 per cent, which means, in case of healthcare expenditures amounting to 5 per cent of GDP in 2012, that the GDP-proportionate expenditure level would increase by 8.5 per cent, that is, to 5.4 percentage points by 2026 as a result of the demographic effect.

<sup>42</sup> These data were processed by Péter Gyenes and Péter Mihalicza, of the IT and System Analysis Division of GYEMSZI; their work is gratefully acknowledged.

<sup>43</sup> For expenditures on free medication to the needy, we assumed a demographic sample identical with the one for pharmaceutical subsidies, while for other expenditures not financed from the Health Fund, we applied the expenditure weights estimated from curative-preventive care aggregated from sub-items.

<sup>44</sup> This is equivalent to assuming that the per capita expenditures of the *various demographic groups* expand by the growth rate of per capita GDP.

**Figure 34**  
Per capita health expenditures resulting from changes in demographic composition



Source: GYEMSZI, own calculation.

Finally, we should also highlight the constraints of the approach outlined above. The projection of the effects of demographic changes on healthcare expenditures as described above represents a static projection method as it treats the present morbidity and use patterns as constant. The longer the projection horizon, the less substantiated that assumption is. For instance, the growth of life expectancy may also increase the number of years spent in good health, while in the approach presented above the number of healthy years effectively remains unchanged.

## 6.5. KEY METHODOLOGICAL ASSUMPTIONS UNDERLYING THE PROJECTION OF BUDGET ITEMS

**Table 11**  
Central government subsystem: revenues

	2012–2016	2017–2026
CENTRAL GOVERNMENT REVENUES		
PAYMENTS BY ECONOMIC ORGANISATIONS		
Corporate profit tax	Tax revenues of non-financial corporations: estimation is based on the adjusted aggregate tax base and the effective tax rate, adjusted for the effects of government measures and the economic cycle. Corporate profit tax paid by financial corporations: based on expert judgement consistent with the stress test scenario in MNB's Report on Financial Stability.	Indexed with nominal GDP growth, adjusted for the delayed tax reducing effects of the tightened rules of the write-off of losses.
Fees of financial institutions	Assuming a declining revenue trend (due to the phase-out of subsidised mortgage loans).	Revenues remain on the 2016 level (assuming no change in the stock of interest subsidised loans).
Special tax on financial institutions	For 2012, the previous year base adjusted for the tax reducing effect of early repayment. For 2013, half of the actual figures for 2011. From 2014 on, we reckon with the new tax on credit institutions harmonized on the EU level, indexed with nominal GDP growth.	The new tax on credit institutions harmonized on the EU level, indexed with nominal GDP growth.
Sector-specific taxes	For 2012 the adjusted base of the previous year plus the change in the estimated weighted net turnover of the sectors concerned. In 2013 the tax will be abolished but residual revenues are expected because of the cash flow overlap.	Abolished



<b>Table 11</b>		
<b>Central government subsystem: revenues (cont'd)</b>		
	<b>2012-2016</b>	<b>2017-2026</b>
Simplified entrepreneurial tax	For 2012, we take into account the effect of the tax rate hike, assuming a 20 per cent exit rate. For 2013, the tax will be abolished but residual revenues are expected due to ex post settlement of accounts.	Abolished
Green taxes	For 2012, estimation is based on the analysis of actual figures. From 2013 on, the base is increased at the rate of real GDP growth (because of the assumed improvement in energy efficiency).	The base is indexed with the rate of real GDP growth (because of the assumed improvement in energy efficiency).
Mining rent	Estimation is based on the assumed oil price and exchange rate trends as well as the extrapolation of the historic hydrocarbon production trend.	Estimation is based on the assumed oil price and exchange rate trends as well as the extrapolation of the historic hydrocarbon production trend.
Gambling tax	Lottery-type games: the base increased by the assumed change in disposable income and the price of tickets. Slot machines: In 2012 we assume flexible adaptation due to the flat-rate tax hike, then from 2013 on, we incorporated the effect of the lower turnover-proportionate tax rate. On-line gambling: we reckon with a minimum amount of revenue.	Indexed with nominal GDP growth.
Other payments	The statutory appropriation in 2012, then indexed with nominal GDP growth.	Indexed with nominal GDP growth.
Other centralized revenues		
Rehabilitation contribution	Projection of the historical revenue trend adjusted for tax changes.	Projection of the historical revenue trend adjusted for tax changes.
Environmental product fee	In 2012, estimated revenue taking into account the measures adopted and the interim figures. From 2013 on, indexed with the real GDP growth rate.	Indexed with nominal GDP growth.
E-toll payments into the central government budget	The estimated gross revenue will be HUF 75 billion in 2013, HUF 150 billion in 2014, then increasing at the rate of nominal GDP growth.	Indexed with nominal GDP growth.
Other	In 2012, the budget appropriation adjusted for the change of fee due to the change in the number of slot machines. From 2013 on, indexed with nominal GDP growth (unadjusted for the change in the number of slot machines).	Indexed with nominal GDP growth.
Profit tax of energy suppliers	For 2012, the budget appropriation. For 2013, the base is adjusted for the estimated effect of the Széll Kálmán Plan 2.0, then indexed with the nominal GDP growth rate.	Indexed with nominal GDP growth.
Company car tax	For 2012, estimation takes into account the increased flat tax rate and adjusts for the assumed behaviour effect (reduction in number of company cars, replacement of cars). From 2013 on, revenues increase by the real GDP growth rate (until 2016, the raised flat tax rates are assumed to be constant).	Indexed with nominal GDP growth.
Telecommunication service tax	For 2012, the revenue calculated from the traffic estimation based on the actual telecommunications figures of the HCSO, adjusted with the contraction of the tax base resulting from the expected supply-side adjustment. From 2013 on, the annualized base is indexed with the average of real consumption expenditures and real GDP growth (until 2016, the flat tax rates are assumed to remain level).	Indexed with nominal GDP growth.

<b>Table 11</b>		
<b>Central government subsystem: revenues (cont'd)</b>		
	<b>2012-2016</b>	<b>2017-2026</b>
Financial transaction tax	Expert judgement based on the detailed transaction data of the MNB. From 2013 on, indexed with the nominal GDP growth rate.	Indexed with nominal GDP growth.
Single insurance tax	For 2013, gross premium income estimated from the 2011 actual figures of MABISZ, then indexed with nominal GDP growth for property insurance. For the projection of the gross premium income from CASCO and MTPL (in 2012, accident tax), which are in close correlation, we assumed a rebound after the setback expected for 2012, and indexed with nominal GDP growth after 2013.	Indexed with nominal GDP growth.
<b>CONSUMPTION RELATED TAXES</b>		
Value added tax	Base amended by the effect of the tax rate hike of 2012 multiplied by the index of household final consumption expenditure, adjusted for the index of the consumption and investment expenditures of the government sector; expert judgement on the revenue effects of the various government measures.	Indexed with the change in household final consumption expenditure, adjusted for the index of the consumption and investment expenditures of the government sector.
Excise tax	Fuels: expert judgement for the volume based on our HUF oil price scenario, adjusted for the reimbursement for commercial Diesel oil. Tobacco: tax rates based on recent tax increases and EU rules on the excise tax content of tobacco products, assuming declining consumption. Alcoholic beverages: base indexed with real growth (assuming constant flat tax rates).	Fuels: expert judgement for the volume based on our HUF oil price scenario, adjusted for the reimbursement for commercial Diesel oil. Tobacco: estimated revenue based on the EU rules on the excise tax content of tobacco products (fixed until 2020) and the projection of historic trend of consumption decline. Alcoholic beverages: the base indexed with real growth.
Registration tax	In 2012, the base is adjusted for the estimated effect of the tax change, then indexed with the nominal GDP growth rate.	Indexed with nominal GDP growth.
<b>PAYMENTS BY HOUSEHOLDS</b>		
Personal income tax	Indexed with the MNB wage bill index and adjusted for the effect of the tax rate change; for withholding taxes, estimation for each tax base; for tax expenditures, based on the sum of tax allowances set out in the Bill, partially adjusted by expert judgement.	Indexed with the wage bill index of MNB. Family tax benefit is adjusted for the effects of demographic changes.
Fees and duties	In 2012, the statutory target adjusted with the results of time series analysis, then indexed with nominal GDP growth.	Indexed with nominal GDP growth.
Other taxes on households	The statutory appropriation in 2012, then indexed with nominal GDP growth.	Indexed with nominal GDP growth.
<b>BUDGETARY INSTITUTIONS AND CHAPTER-MANAGED APPROPRIATIONS</b>		
Revenues of budgetary institutions	For 2012, the statutory target adjusted with the results of time series analysis, then indexed with the nominal growth of potential GDP (in line with expenditure growth).	Indexed with the nominal change of GDP (in line with expenditure growth).
Revenues of chapter managed professional appropriations	For 2012, the statutory target adjusted with the results of time series analysis, then indexed with the nominal growth of potential GDP (in line with expenditure growth).	Indexed with the nominal change of GDP (in line with expenditure growth).
EU funding to chapter managed professional appropriations	We prepared our own estimation for the overlapping use of the funds of the 2007-2013 period (partly relying on the past trend). The full effect of the new assistance cycle will be present from 2016 on.	We adopted the COM proposal for the 2014-2020 period, fixing it as a percentage of GDP for subsequent years, assuming cash flow overlapping to be stable.
<b>PAYMENTS RELATED TO STATE OR TREASURY PROPERTY</b>	The statutory target in 2012, then indexed with nominal GDP growth.	Indexed with nominal GDP growth.

<b>Table 11</b>		
<b>Central government subsystem: revenues (cont'd)</b>		
	<b>2012-2016</b>	<b>2017-2026</b>
OTHER REVENUES	In 2012, the statutory target adjusted by expert judgement, then indexed with nominal GDP growth.	Indexed with nominal GDP growth.
OTHER REVENUES FROM EU	In 2012, the statutory target adjusted by expert judgement, then indexed with nominal GDP growth.	Indexed with nominal GDP growth.
DEBT SERVICE RELATED REVENUES	Based on assumptions on the interest bearing assets of the general government and their expected yields, as well as estimates for interest revenues recorded in the context of debt management.	Based on assumptions on the interest bearing assets of the general government and their expected yields, as well as estimates for interest revenues recorded in the context of debt management.
<b>REVENUES OF EXTRA-BUDGETARY FUNDS</b>		
LMF – Health insurance and labour market contribution	The base multiplied by the wage bill index and adjusted for the effects of measures affecting the contribution base.	Indexed with the wage bill index.
LMF – Vocational training contribution	The base multiplied by the wage bill index and adjusted for the effects of measures affecting the tax base.	Indexed with the wage bill index.
R&D Fund – Innovation contribution	The base multiplied by the nominal GDP index; for 2013-2014 adjusted for the effects of the broadening of the contribution base.	Indexed with nominal GDP growth.
NCF – 5/90 lottery revenue	The base increased by the estimated change in disposable real income and in the price of lottery tickets.	Indexed with nominal GDP growth.
Other revenues of extra-budgetary funds	In 2012, equal to the budget appropriations, then the majority of items indexed with nominal GDP growth, EU funds follow the trend of total EU transfers.	Indexed with nominal GDP growth.
<b>REVENUES OF SOCIAL SECURITY FUNDS</b>		
Other taxes and contributions	Base of 2011 multiplied by the estimated wage bill index, adjusted for the expected effect of measures (reduced contribution rate, broadening of tax base) and changes in effective level of tax compliance for 2012. From 2013 on, most types of contributions are projected using the wage bill index, adjusted for the estimated effect of preferential contribution rates.	Indexed with the wage bill index.
Per capita health contribution	Based on the 2012 actual figures available. Separate projection of the items subject to 10, 14 and 27 per cent tax rates to the whole of 2012. The per capita health contribution on dividends (14 per cent) multiplied by nominal GDP growth from 2014 on (half that rate for 2013), the other two items indexed with the wage bill growth.	The per capita health contribution on dividends (14 per cent) increased by nominal GDP growth from 2014 on (half that rate for 2013), the other two items indexed with the wage bill growth.
Public health product tax	Projection of the turnover and volumes of the affected products estimated from the HBS time series and retail trade turnover figures (with CPI and consumption expenditure), taking into account the estimated drop in consumption resulting from the tax increase in 2012.	Indexed with nominal GDP growth.
Accident tax	For 2012, based on the estimated gross MTPL premium income, a minor bounce-back from the 2012 decline in 2013, then indexed with nominal GDP.	As part of the new single insurance tax, indexed with nominal GDP growth.

**Table 11**  
**Central government subsystem: revenues (cont'd)**

	2012–2016	2017–2026
Payments by pharmaceutical producers	Forecast consistent with pharmaceutical expenditures and legislative changes. From 2013 on, payments of pharmaceutical producers are increased in line with pharmaceutical subsidy growth trends. By 2016 the rabate component is phased out, assuming the expenditure appropriation and the expected outturn to be equal in the medium term. Up to 2014, the medical representatives' fees are calculated based on the items specified in law, assuming the number of representatives to be unchanged, then the base is increased at the rate of GDP growth.	Payments by pharmaceutical producers are increased in line with pharmaceutical subsidy growth trends. Medical representative fee payments indexed with nominal GDP growth.
Operational and other revenues	Appropriation in the Budget Bill of 2012, indexed by inflation for 2013 and by nominal GDP growth from 2014 on.	Indexed with nominal GDP growth.

**Table 12**  
**Central government subsystem: expenditures**

	2012–2016	2017–2026
CENTRAL GOVERNMENT EXPENDITURES		
ONE-OFF AND NORMATIVE SUBSIDIES	Appropriation in the Budget Bill of 2012, then indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.
SUBSIDIES TO PUBLIC SERVICE MEDIA	Appropriation in the Budget Bill of 2012, then indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.
CONSUMER PRICE SUBSIDY	Appropriation in the Budget Bill of 2012, then indexed with the nominal growth of potential GDP (in 2013, adjusted to take into account the overlapping effects of the narrowed scope of subsidies).	Indexed with the nominal growth of potential GDP.
HOUSING SUBSIDIES	Appropriation in the Budget Bill of 2012, adjusted for the effects of the agreement with the Banking Association. From 2013 on, indexed with the nominal growth of potential GDP, taking into account the gradual phase-out of the effects of the agreement with the Banking Association and the introduction of the new social policy allowance.	Indexed with the nominal growth of potential GDP.
NATIONAL SOCIAL POLICY FUND		
Family benefits, social transfers	Estimate based on the trends of the reference population and of the ratio of take-up, and the expected development of specific benefits (up to 2013: fixed in nominal terms, thereafter in line with the nominal growth of potential GDP).	Estimate based on the trends of the reference population and of the ratio of take-up, and the expected development of specific benefits.
Benefits below retirement age	Reflecting the tightened conditions of early retirement from 2013 on, taking into account the expected headcount of women with 40 years of service. Initial benefits estimated based on the rules of awarding new old-age pensions.	Reflecting the tightened conditions of early retirement on a continuing basis, taking into account the expected headcount of women with 40 years of service. Initial benefits estimated based on the rules of awarding new old-age pensions.
EXPENDITURES OF BUDGETARY INSTITUTIONS AND CHAPTER-MANAGED APPROPRIATIONS		
Expenditures of budgetary institutions	Appropriation in the Budget Bill of 2012. From 2013 on, reflecting the effects of laws and measures adopted, and indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.

Table 12 Central government subsystem: expenditures (cont'd)		
	2012-2016	2017-2026
Expenditures of chapter managed professional appropriations	Appropriation in the Budget Bill of 2012. From 2013 on, reflecting the effects of laws and measures adopted, and indexed with the nominal growth of potential GDP. Aggregate investment expenditures estimated on the level of the general government (see below).	Indexed with the nominal growth of potential GDP.
RESERVES	Appropriation in the Budget Bill of 2012 (assuming the cancellation of extraordinary "unallocated central reserves"), then indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.
EXPENDITURES RELATED TO MNB	Value calculated based on the net interest expenditure estimated from the projection of the key items of the MNB balance sheet and the realized exchange rate earnings.	Value calculated based on the net interest expenditure estimated from the projection of the key items of the MNB balance sheet and the realized exchange rate earnings.
STATE PROPERTY RELATED EXPENDITURES	Appropriation in the Budget Bill of 2012, then indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.
EXTRAORDINARY GOVERNMENT EXPENDITURES AND OTHER EXPENDITURES	Appropriation in the Budget Bill of 2012, then indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.
EXPENDITURES RELATED TO STATE GUARANTEES	Appropriation in the Budget Bill of 2012, then indexed with the nominal growth of potential GDP.	Indexed with the nominal growth of potential GDP.
DEBT ASSUMPTION AND DEBT RELIEF	We reckon with no debt assumption.	We reckon with no debt assumption.
CONTRIBUTION TO EU BUDGET	In 2012, the statutory target modified with the exchange rate assumption of the MNB, then estimate based on the GDP growth rate and the assumed exchange rate trend.	Estimate based on the GDP growth rate and the assumed exchange rate trend.
DEBT SERVICE, INTEREST PAYMENT	The financing requirement of the general government is estimated based on the primary balance and the debt falling due, the structure of issuance on the basis of current trends and the probable increase of the ratio of HUF financing. The HUF bond yields are estimated with the macro yield curve model, which takes into account the macroeconomic path and historic trends, while foreign exchange yields result as the sum of the assumed risk-free yields and the estimated future sovereign spreads.	The financing requirement of the general government is estimated based on the primary balance and the debt falling due, the structure of issuance on the basis of current trends and the probable increase of the ratio of HUF financing. The HUF bond yields are estimated with the macro yield curve model, which takes into account the macroeconomic path and historic trends, while foreign exchange yields result as the sum of the assumed risk-free yields and the estimated future sovereign spreads. We assume the sovereign risk premium to decline up to 2018, to stabilise at a level significantly lower than at present but slightly above the pre-crisis level.
EXPENDITURES OF EXTRA-BUDGETARY FUNDS		
LMF – Passive benefits	Unemployment benefits: base indexed with the change in the number of unemployed and in the gross average wage, adjusted for the effects of the 2011 measures narrowing the scope of benefits. Reimbursement of early retirement pensions: the statutory target in 2012, then in line with the estimated difference between expected disbursements and payments by employers.	Unemployment benefits: base indexed with the change in the number of unemployed and in the gross average wage. Reimbursement of early retirement pensions: gradually terminated parallel with the phase-out of the benefit.
LMF – Active and other employment expenditures	The statutory target in 2012, then the majority of items increases in accordance with the wage bill index. Public employment expenditures indexed with the growth of potential GDP.	Indexed with the wage bill index, or in the case of public employment, with the nominal change of potential GDP.

Table 12

## Central government subsystem: expenditures (cont'd)

	2012–2016	2017–2026
Expenditures of other funds	The statutory target in 2012, then up to 2016 expenditures gradually catch up with revenues, while for the Nuclear Fund, they increase in line with potential GDP growth.	Nuclear Fund: indexed with the nominal growth of potential GDP; the additional expenditures relating to the dismantling of the reactors of the Paks nuclear facility at the end of their technological life are considered as part of aggregate investment expenditures. Other funds: expenditure path resulting a zero balance.
<b>EXPENDITURES OF SOCIAL SECURITY FUNDS</b>		
Retirement benefits (incl. disability benefits from the HIF)	Coverage profiles projected by age, benefit type and gender, adjusted for the effects of retirement age increase and tightening of eligibility rules. Average benefits by type of benefit, sex and age increase in line with the price index, adjusted for the replacement effect due to new entrants. In the case of persons with altered working capacity, the age-specific rate of new awards and its composition by degree of health impairment remains constant but at the end of the rehabilitation period, receipt of the rehabilitation benefit is terminated. Disability benefits are defined in light of the new assessment rules, considering statutory minima and maxima for both the existing recipients and new entrants.	Coverage profiles projected by age, benefit type and gender, adjusted for the effects of retirement age increase and tightening of eligibility rules. Average benefits by type of benefit, sex and age increase in line with the price index, adjusted for the replacement effect due to new entrants. In the case of persons with altered working capacity, the age-specific rate of new awards and its composition by degree of health impairment remains constant but at the end of the rehabilitation period, receipt of the rehabilitation benefit is terminated. Disability benefits are defined in light of the new assessment rules, considering statutory minima and maxima for both the existing recipients and new entrants.
Sick pay	Increased in line with the wage bill index, adjusted for effects of measures.	Indexed with the wage bill index.
Childcare benefit, pregnancy-confinement all.	Indexed with the change of average gross wages, adjusted for the effects of demographic trends and measures.	Indexed with average gross wage growth, adjusted for the change in recipients due to demographic trends.
Pharmaceutical subsidies	Projection of seasonally adjusted monthly subsidy outflow modified by the effects of measures in 2011–2013. Up to 2014, the underlying expenditure trend increases at a rate below the CPI, then at the rate of the nominal growth of potential GDP, from 2013 multiplied by the demographic index calculated for pharmaceutical subsidies.	Indexed with the nominal change of GDP and adjusted for the effects of demographic trends on expenditures.
Curative-preventive care	In 2012, the statutory target adjusted for the effect of the announced wage measure. From 2013 on, the part of the base relating to labour expenditure is indexed with the wage growth of the public sector (reflecting the nominal wage freeze in 2013), while other expenditures are indexed with the nominal change of potential GDP, modified with the effects of demographic trends and, between 2014–2016, of the assumed additional wage increase.	Indexed with the nominal change of GDP and adjusted for the effects of demographic trends on expenditures.
Other benefits and expenditures	In 2012, we use the statutory target, from 2013 on, reflecting the effects of measures, we assume an expenditure scenario indexed with the nominal change of potential GDP and, in case of demographically sensitive items (such as subsidies on therapeutic appliances also multiplied by a benefit-specific demographic index.	Indexed with the nominal change of GDP and in the case of demographically sensitive items also adjusted for the effects of demographic trends.

Table 13 Other subsystems and adjustments		
	2012–2016	2017–2026
LOCAL GOVERNMENTS		
(Consolidated) balance of the local government system	Expert forecast based on macroeconomic parameters and time series analyses, taking into account the effects of government measures (reclassification of institutions into the central government subsystem; contraction of responsibilities and funding, etc.).	Expert forecast based on macroeconomic parameters and time series analyses; taking into account the effects of government measures (reclassification of institutions into the central government subsystem; contraction of responsibilities and funding, etc.).
GFS-ESA adjustment	Own estimate for the accruals based interest rate adjustment; own estimate based on the actual figures of the prior period for the accruals based tax revenue adjustment; the losses on the commercial operations of MNB are recorded among accruals based adjustments for 2014–2016.	Own estimate for the accruals based interest rate adjustment; own estimate based on the actual figures of the prior period for the accruals based tax revenue adjustment.
General government (ESA) investment	The level of investments increases gradually to the level corresponding to the depreciation of the stock of tangible assets. This keeps the stock of tangible assets constant as a percentage of GDP.	The 2016 level of investments is unchanged as a percentage of GDP throughout the projection horizon.





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