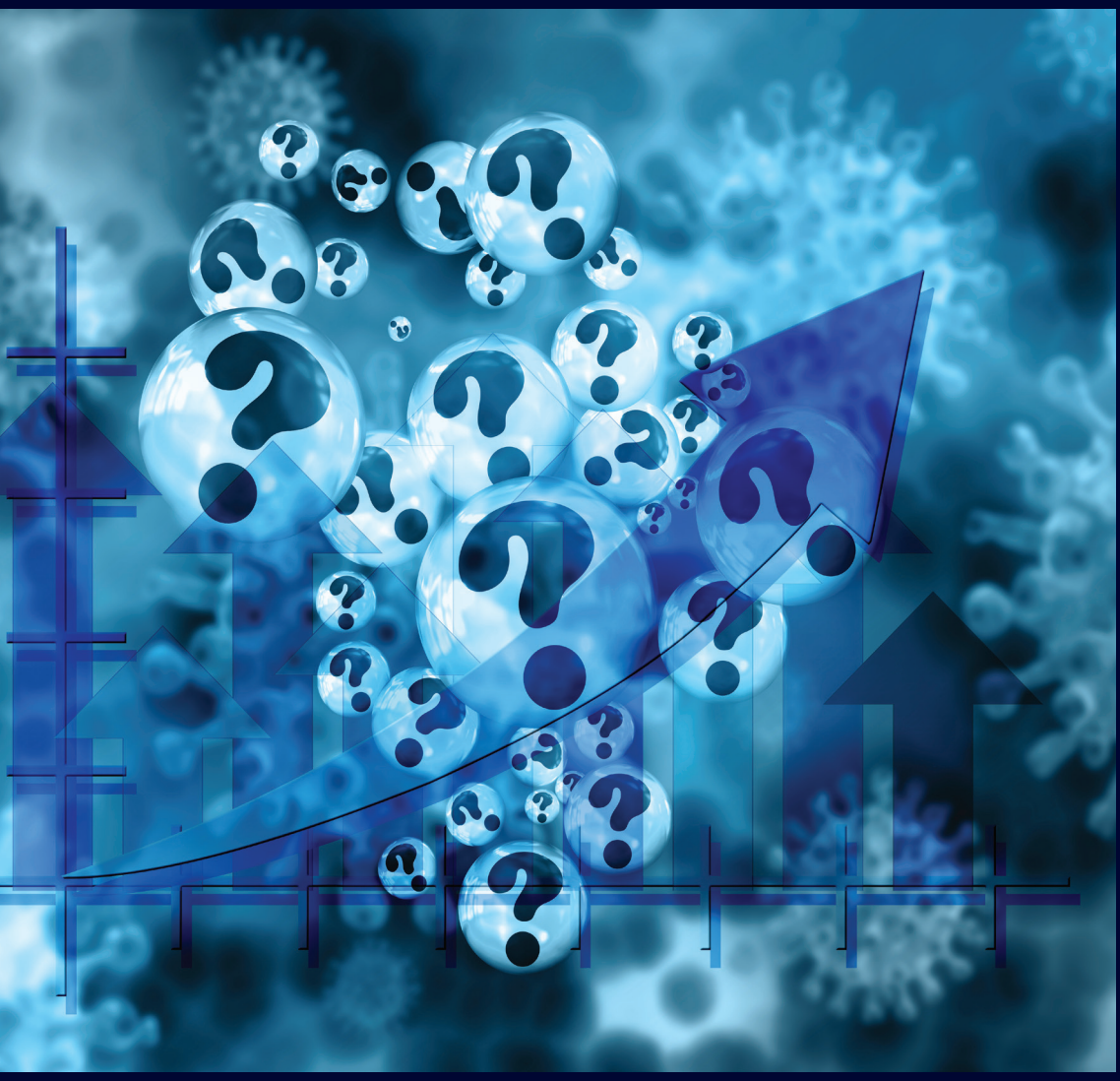
KÖLTSÉGVETÉSI TANÁCS

Magyar Közgazdasági Társaság



National economy and public finances in the time of coronavirus pandemic

Analyses prepared for the Fiscal Council of Hungary in 2020

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Published by the Hungarian Economic Association

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As a foreword…

The annual joint conferences organised by the Hungarian Economic Association (HEA) and the Fiscal Council (FC) go back almost a decade, eventually turning into a major flagship event of the HEA. The yearly conferences alternately housed by the Kossuth Club and the Budapest Business School provide an excellent opportunity for the organisations responsible for FC background studies to present their latest analyses and prognoses and to discuss the current public finance processes before a wide professional audience of the HEA.

The Hungarian Economic Association is honoured to have the opportunity to organise these events as a qualified partner of the Fiscal Council, and thereby the National Bank of Hungary and the State Audit Office. As a non-profit entity we pursue our mission set out in the Articles of Association by providing a platform for meaningful policy debates, open professional dialogues and national economy issues, in this case focusing on the government budget and its subsystems.

2020 is extraordinary in many ways: for instance, this book has been published as a replacement for this year's conference due to the COVID-19 pandemic. The recent events have changed not only our plans, but in a sense everything we used to know, or believed to know about the functioning of the economy. The kind of shock caused by the pandemic to both demand and supply is perhaps unprecedented in economic history. The highly integrated global economy interwoven with networks and supply chains has been demolished and broken down – at least for the time being. Employment has been hit and the economic boom experienced in recent years has come to a halt: the economic actors and the households around the world look to the governments and the central banks to help them survive and recover. The new circumstances have brought new challenges which require novel solutions and responses; yet at the moment we are unable to clearly see the world in which we are to land after the pandemic-induced crisis.

Naturally, the new situation also presents new challenges in terms of public finance processes. The governments will have to facilitate fast economic recovery and to save businesses and workplaces even at the cost of higher deficits than specified under the Maastricht Treaty. If ever there was a need for a comprehensive picture from the best analysts as to the effects of the pandemic on Hungary's economy, public finances and

the individual sectors, this must be it. Indeed, it could provide an adequate basis also for further analyses and strategy-making. And it will be instrumental in helping us land in a post-pandemic, increasingly digital world as winners.

Budapest, 6 October 2020

Gyula Pleschinger
President
Hungarian Economic Association

Introduction

As the pandemic crisis unfolded, it accelerated the publishing of this volume of research studies resumés, which is also available online on the website of the Fiscal Council (FC). The FC has decided not only to publish the scientific studies that were prepared to substantiate the Council's decisions during the emergency of the pandemic, but also to ask the authors to summarise and publish the respective contents in an update of the economic-public finance processes of the last months of 2020. In addition to the analyses in areas that directly affect public finance positions, the FC considers its task to carry out annual, broader studies in areas that indirectly affect the budget and the financing of public tasks. In previous years, such topic was related to health care, while this year environmental and water protection came under closer inspection.

Of course, a collection of studies cannot substitute in the least the traditional conference that had to be cancelled this year. Indeed, the intention earlier was to strengthen also in 2020 the knowledge-transfer opportunities of the forums evoking great professional and press interest – traditionally organised in co-operation with the Hungarian Economic Association (MKT) – by including the main findings and illustrations of the lectures summarized in a bilingual, Hungarian-English volume. But in the autumn of 2020 the epidemic returned also to Hungary. This has also thwarted even the opportunity for a personal exchange of views and the chance for a broader professional thinking created by the forum organized by MKT. However, it could not prevent the series of studies from being widely publicised in the care of FC and MKT from which, thanks to the professional work of the editors of *Közgazdasági Szemle* (the monthly economic journal of the Hungarian Academy of Sciences), the reader can get a glimpse on what a versatile, multi-perspective focus the Fiscal Council used when forming its opinions and making its decisions at the planning and the review of the Hungarian central budget and its half-yearly implementation.

For this reason, on behalf of the Council, here on these pages, I would like to thank the authors, the leaders of the Hungarian Economic Association and also the editors of *Közgazdasági Szemle*; for they provided great assistance making the mission of the FC even more widely known and more transparent.

Using a broad range of studies, building on a wide range of scientific expertise, the publication of the materials on the Internet, the professional forums and their

main messages and forecasts, the collaborative co-operation with the written and electronic press, and now the publication of this summary volume are inseparable from the Fiscal Council's statutory approach. Please, allow me to talk about the latter in this introduction in some detail.

* * *

It is still fundamental for the Hungarian budgetary practice – as it was with the 1989 constitutional amendment, then with the Association Agreement, signed in 1991, that opened the way for Hungary towards European integration, and finally with our accession to the EU in 2004 – that the requirements which express the connection with the socio-economic-political community of European countries have appeared and confirmed by our Fundamental Law adopted in 2011. Accession to the EU entailed the harmonisation of obligations, requiring the integration of common European values and standards, *including equilibrium requirements in public finances.*

After the millennium, Hungary was not the only one to face the growing problems of public overspending and, as a consequence, deepening debt issues, which led to the weakening of the country's financial stability. In our country, the situation was different as the smaller and larger crises were not the result of the severely damaged economy due to some pandemic caused by a hitherto unknown virus, but the mutually reinforcing/weakening process of overlaps between political and economic cycles – overspending and indebtedness dictated by the desire of vote maximisation. Thus, action against them could be effective with economic instruments, a consistent rule-based fiscal policy and restraint in spending. *Considering the pre-pandemic situation, where the rule-based fiscal system – fiscal-policy rules, technical regulations and their institutional guarantees – has been applied consistently, a favourable, discipline-enhancing effect of this budgetary framework has been demonstrated, as it could be viewed mainly through the decline of indebtedness.*

Returning to the "beginnings", by the end of 2008 – under the shadow of the looming state bankruptcy and the pressure of IMF-EU borrowing – *the law on responsible budget management was passed*, which was also called the "ceiling law" due to its perception, intervention mechanism/spending limits.

The Council was composed of a professional expert representing the head of state, two other experts, as proposed by the heads of the SAO and the MNB each, and the related staff was a large-scale apparatus with significant capability of macroeconomic analysis. The "ceiling law" was in force until the end of 2010.

Hungary's *Fundamental Law,* adopted on 18 April 2011, devotes a separate chapter to public finances. It stipulates the budgetary rights of the Parliament, and states that public funds shall be managed in a transparent and controllable manner, keeping in mind the requirements of legality, economy, and effectiveness. It also sets a limit on indebtedness, not only for the general government as a whole but also for local governments/municipalities. This also opened a new chapter in the regulation of the rule-based budget system, corresponding to its weight and significance. By creating the *public-debt rule,* the Fundamental Law also determined the amount of public debt that could be planned each year. According to this, the National

Assembly shall not pass a law on the central budget, as a result of which public debt would exceed half of the GDP. As long as the public debt exceeds this level, Parliament shall only pass a central budget law that includes a reduction in the ratio of public debt to GDP, except in years when the economy shrinks, for example due to an economic or pandemic crisis, or natural disaster.

The Fundamental Law raised the Fiscal Council among the conditions of constitutional operation, empowering it to monitor the observance of the rules of fiscal stability, while it also stipulated the Chairman of the Council – appointed by the President of the Republic – and the two members: the Governor of the National Bank and the President of the State Audit Office. The Council performs its duties in accordance with the Fundamental Law and other statutes. Among them, on the one hand, it participates in the process of drafting the law on the central budget as a body supporting the legislative activity of the National Assembly, *providing opinion on the validity of the central budget* and, on the other hand, *examining its compliance with the public debt rule – giving or withholding its endorsement.* With the latter task and competence, the Council, as an independent fiscal institution, has *a role and responsibility in the legislative process* related to the budget law – at the so-called parliamentary final vote. According to this, if the FC indicates disagreement in its opinion on the draft budget, it shall have to be renegotiated by the Government and agreed upon by the Council. The power of the Council's prior consent to the budget bill regarding compliance with the public debt rule is "tougher"; if the FC refuses to give prior consent, exercising its already mentioned "veto right", the final vote should be postponed and the procedure should continue until the Council has given its consent.

This statutory mandate requires decisive participation in the preparation of annual budgets and, accordingly, the use of a network of experts, leaning on research and analytic background underpinning such an orientation and focus that helps substantiating the decisions of the FC during the implementation of its tasks.

Longer- and medium-term outlooks, sustainability studies and analyses related to the semi-annual monitoring of the implementation of the current budget law add to this by forecasting and providing feedback, which helps the Council to broaden its horizons and assists with the multifaceted examination of the annual budget processes and the realisation of goals.

With its own means and activities, besides its strong powers for budgetary discipline and its mere presence that serves as a guarantee of fiscal prudence, through the very wide-ranging, multifaceted supporting expert work, the Council contributed to the success of the fiscal-balance policy, to the termination of the Excessive Deficit Procedure in 2013, and to the significant, decade-long decline in government debt as a share of GDP until 2019.

In previous years, the evaluations of the State Audit Office, the National Bank and the analyses prepared by research organisations from various segments and perspectives of the external advisory and expert palette – In addition to a significant number of sometimes serious critical findings and corrective proposals – were painting a picture about the strengthening stability of the economy and public finances, the

rising trajectory of the country. The studies published now are inevitable reflections of the serious difficulties caused by the pandemic situation.

However, accurate, factual knowledge and a reliable perspective are essential to a successful fight against the effects of the crisis and a wider knowledge of them, both at home and abroad, and can be a means to return to the path we had to leave, as soon as possible. The Fiscal Council, in co-operation with the researchers providing professional background and the Hungarian Economic Association, therefore considers the publication of the summary of the studies to be of decisive importance.

At the end of this introduction, it should also be emphasized that hopefully the FC can also contribute to the recovery from the current economic and public finance situation, and in the next volume of studies, expert work can talk already about better results.

Árpád Kovács
Chairman of the Fiscal Council

DIÁNA HORVÁTH (ED.)[1]

Macroeconomic and budgetary situation in 2019

Overview of international economic processes

The GDP of the European Union grew by 1.5% in 2019, a slowdown of 0.5 percentage points from the previous year. Growth was similar in the euro area at 1.2 %, down by 0.7 percentage points from 2018. The US economy also slowed, from 2.9% to 2.3%, while Japan's accelerated from 0.7% to 1.2%. Growth slowed in all of the euro zone's largest economies: from 1.5% to 0.6% in Germany and from 1.7% to 1.3% in France. In contrast, growth in the UK accelerated from 1.3% to 1.4%. The expansion of the Visegrad countries continued to exceed the EU average, but they also slowed down in 2019. The growth rate was 2.4% in the Czech Republic, 4.1% in Poland and 2.3% in Slovakia, compared with an increase of 3.2%, 5.3% and 3.9%, respectively, in 2018.

In 2019, the number of employees continued to rise in both the US and the European Union, while the pace of expansion in both economies slowed compared to the previous year. At the same time, the unemployment rate in the US fell to a 50-year low of 3.5% by the end of the year, compared to 6.4% in the European Union. Both figures are 0.4 percentage points lower than in the previous year.

The European Central Bank reduced its deposit rate by 0.1 percentage point to –0.5% last year but did not change the base rate of 0%. In addition, the ECB restarted its asset purchase programme in November due to falling inflation, which was discontinued at the end of 2018. On November 1, Christine Lagarde, former IMF president, replaced Mario Draghi as head of the European Central Bank, but the central bank's monetary policy did not change under the new president either, based on the December interest rate decision. The Federal Reserve also cut its key rate three times in 2019 to the 1.5–1.75% range, citing below-target money deterioration, despite rising employment and household consumption in the US. Of the regional central banks, only the Czech National Bank changed its interest rate conditions by raising interest rates by 25 basis points (to 2%) in May 2019, although in Poland and Romania the rate of monetary deterioration was above the central bank target.

Japanese 10-year government bond yields showed a declining trend until early September 2019 and then increased for the rest of the year. Overall, it was close to

[1] Századvég Economic Research Institute. The report was prepared by Diána Horváth, Gergely Horváth, Tamás Isépy, Dániel Molnár, Anna Nikl, István Posgay and Gábor Regős.

0% at the beginning of the year and at the end of the year it was in a slightly negative range. The United Kingdom also saw a decline until early September, but there was a smaller correction than in Japan. Yields of 1.15% at the beginning of the year fell to 0.83% by the end of the year. The largest decline in yields was observed for 10-year US government securities: in 2019, yields fell by a total of 75.0 basis points, to 1.92% at the end of the year. In France, the yield on 10-year government securities was still close to 0.7% at the beginning of the year, falling to –0.44% by the end of August and closing at 0.12% at the end of the year. Thus, French 10-year government bond yields fell by more than 57 basis points for the year as a whole. The declining trend from the end of August to the beginning of September can also be observed for the German 10-year government bond yield, which was then followed by a correction period. As a result, the German government bond yield of 0.21% at the beginning of the year decreased to –0.19% by the end of the year. The major floating exchange rate currencies showed a different ability against the dollar in 2019: the euro and the Swiss franc weakened significantly (by 2.9 and 1.7%, respectively), the yuan remained broadly unchanged, while the yen and the pound both strengthened (by 0.4 and 2.6%, respectively). The world's leading stock indices have shown an upward trend over the past year: DAX at 23.0, Dow Jones Index at 21.5, Stoxx 600 at 21.2, Shanghai Composite Index and Nikkei 225 at 20.9, while the FTSE 100 increased by 11.0% from its level in early 2019.

Oil prices in 2019 were on average 10.5% lower than the year before. As a result, inflation has also typically slowed down, from 2.2% to 1.3% in the United States, from 1.9% to 1.5% in the European Union and from 1.8% to 1.2% in the euro area. Within the Union, the countries with the highest inflation in 2019 were Romania (3.9%), Hungary (3.4%), Slovakia (2.8%), the Netherlands (2.7%) and Latvia (2.7%)). In contrast, consumer prices rose by just 0.3% in Portugal, 0.5% in Cyprus and Greece, and 0.6% in Italy in one year.

In the US, the previously announced tax cuts (Tax Cuts and Jobs Act) significantly increased the budget deficit, while in the European Union it increased slightly last year. However, for the first three quarters of 2019, most EU member states were able to show surpluses. As a result, government debt fell from 81.4% of GDP to 80.1% in the region as a whole but the debt ratio also increased in 6 Member States.

Overview of economic processes in Hungary

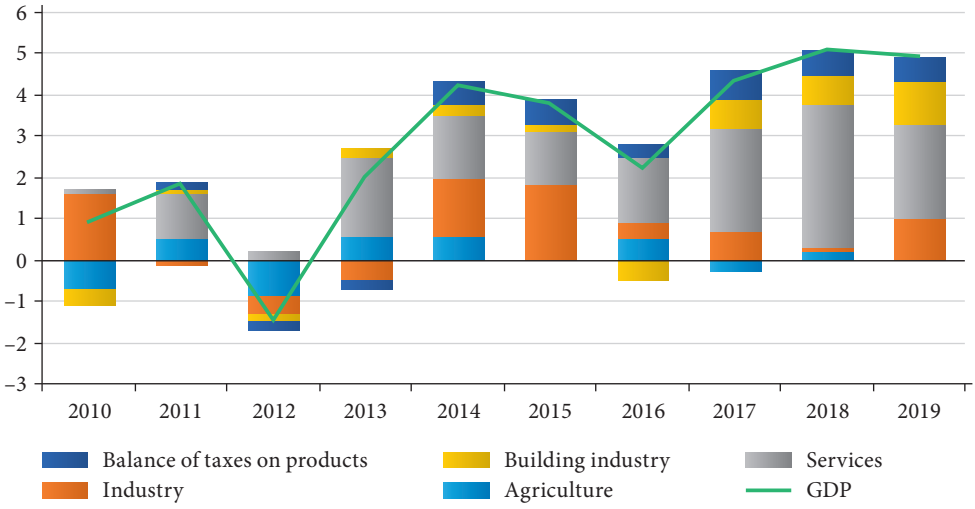
In 2019, the expansion of the Hungarian economy exceeded expectations: according to raw data and seasonally and calendar-adjusted data, it was 4.9%.[2] This exceeded the growth of the Slovak and Czech economies (2.3 and 2.4%) and that of the Polish economy (4.1%).[3]

[2] The revision by the Hungarian Central Statistics Office (HCSO) carried out after the conclusion of the study reduced the growth rate to 4.6% by revising the 2018 GDP data upwards.

[3] According to revisions made since then, the Czech economy grew by 2.3% in 2019, while the Polish economy grew by 4.5%.

Similarly to 2018, the GDP deflator describing the development of producer prices was 4.5%. Last year, all sectors of the economy, with the exception of agriculture (–0.3%), were able to contribute to growth. Added value in industry increased by 5.0%, in construction by 21.4% and in service sectors by 4.2% compared to 2018. Thus, the growth contribution of industry and construction was 1–1 percentage point and that of services 2.3 percentage points, while agriculture did not contribute to expansion, although it did not slow it down either. Within the service sector, the trade, motor vehicle repair, accommodation and food service activities grew by 8.8% and the professional, scientific, technical, administrative and support service activities by 6.7%.

Figure 1
Contribution to GDP growth by sector (percentage)

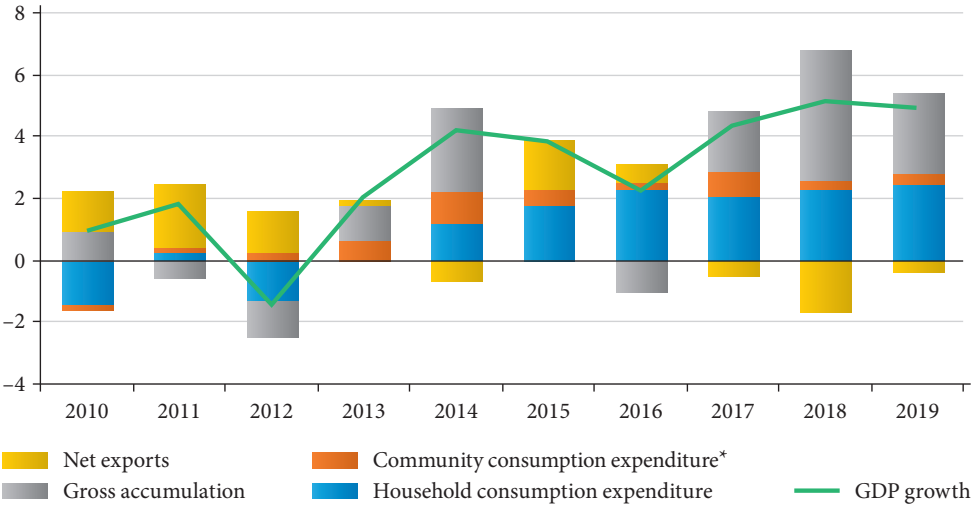


Source: HSCO.

On the consumption side, household consumption expenditure increased by 5.0%, adding 2.4 percentage points to the expansion. This is mainly due to a substantial increase in household disposable income as a result of declining unemployment and an average wage increase of over 10%. Gross fixed capital formation increased by 15.3%, making its contribution 3.9 percentage points. In addition to the use of EU funds, this is due to corporate investments and the growing number of housing constructions, which was supported by the family home discount in addition to the reduced VAT rate. In contrast, net exports slowed growth by 0.4 percentage points. Exports grew by 6.0% while imports by 6.9%, the latter stemming from a significant expansion in domestic demand. At the same time, foreign trade in goods and services followed a similar trend: exports of goods grew by 4.2% and imports by 5.7%, while in the case of services the expansion was 8.2% and 9.2%, respectively. At the same time, the net export surplus is entirely due to foreign trade in services, the balance of which showed an asset of HUF 2,602 billion, while that of goods amounted to a liability of HUF 883 billion. Due to the decrease in the foreign trade

surplus, the value of the current account as a share of GDP decreased by 0.8 percentage points to –0.8% in 2019.[4]

Figure 2
Contribution to GDP growth, consumption side (percentage)



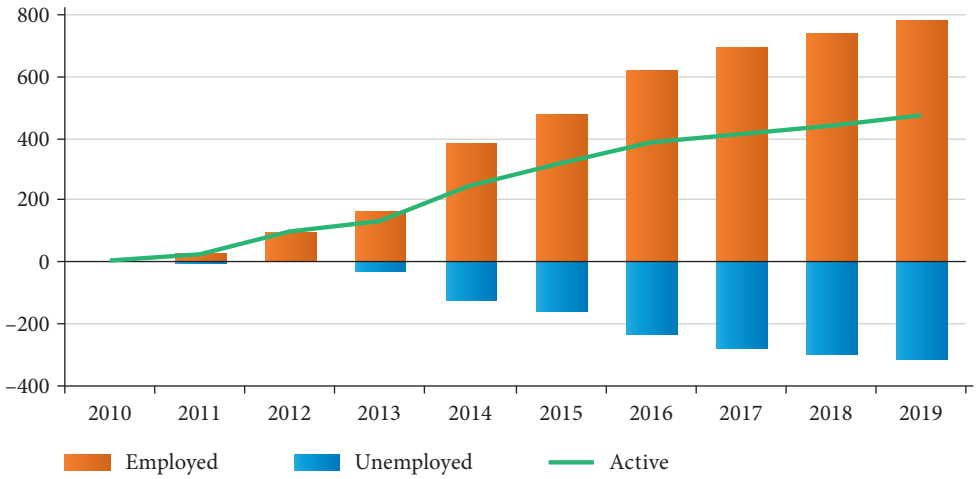
Source: HCSO.
* Includes social benefits in kind, regardless of their source.

In 2019, employment increased at a somewhat slower pace than in the previous year, by 43,000 to 4 million 512,000. As a result, the employment rate rose to 60.8% in the 15–74 age group, which is the same as the EU average. Last year, employment in the private sector increased further by 42,000 which, however, lagged behind the expansion experienced in 2018. In the public sector, on the other hand, the number of employees continued to decline, largely as a result of the decline in public employment (a special government scheme aimed at mitigating unemployment). In 2019, an average of 101,000 people worked in Start work programmes, which is 25,000 less than in the previous year. The number of unemployed fell by 12,000 to 160,000 last year, while their share fell to 3.4%. It is also a positive process that the share of the long-term unemployed (people without job for at least a year) has fallen to another low point within this group, to 32.5%. In 2019, labour shortages eased in the private sector, while labour shortages increased in the public sector, thus causing a more significant problem in the latter. The average gross earnings increased by 11.4% to 367.8 thousand HUF at a rate almost the same as in the previous year. In the private sector, the increase in the minimum wage and the guaranteed minimum wage by 8–8% at the beginning of the year, as well as labour shortages, have driven wage growth, while in the public sector public wage arrangements for public administration and social welfare should be highlighted. Net real earnings increased at a slightly slower pace

[4] Revisions since finalizing the study increased both the 2018 and 2019 balance to 0.3%.

than in 2018, by 7.7% in 2019, while inflation-adjusted average earnings increased by 51.8% compared to 2010.

Figure 3
Activity, employment and unemployment (2010 = 0)



Source: HSCO, Századvég ed.

In 2019, inflation averaged 3.4% in Hungary after 2.8% the previous year. Meanwhile, core inflation rose from 2.5% to 3.8%. Thus, on an annual average, inflation was higher than in the previous year and also exceeded the central bank target but was in the target range of 2 to 4%. Among the individual product groups, the largest price increase, 8.1%, was measured in the case of alcoholic beverages and tobacco products, followed by a 5.4% increase in food prices. The very modest, merely 0.4% increase in the price of fuels played a significant role in the moderate increase in the prices of other goods and fuels (1.3%). Prices for services rose by 3% and for household energy and clothing by 1% each, while those for durable consumer goods fell by 0.3%. Among the core inflation indicators of the Hungarian National Bank, core inflation filtered from indirect taxes was 3.4%, demand-sensitive inflation was 3.2%, while inflation of seldom variable products was 3.5%.

The Monetary Council left its key interest rate unchanged (0.9%) at each interest rate decision meeting during the past year. At the same time, it narrowed the interest rate corridor in March, raising the overnight deposit rate by 10 basis points to –5 basis points. However, given that the BUBOR fixations were not concluded near the lower edge of the interest rate corridor, the increase in the overnight deposit rate was marginal, rather indicative, as BUBOR increased by a few basis points thereafter.

With the withdrawal of the 3-month deposit on 31 December 2018, the reserve requirement took over the role of the underlying reserve. From January 2019, the central bank will use two tools from its toolbox of unconventional short-term yields. These are the volume adjustment of FX swaps (forint liquidity-providing foreign exchange swaps) and the modification of the interest rate corridor. Furthermore, the central

bank introduced the "NHP" fixed corporate structure from January 2019, in the case of which, however, according to the central bank's communication, the goal is not to increase the existing liquidity in the banking system, but to change the structure of existing SME loans. The central bank wants not only retail market participants but also SMEs that are more vulnerable than large companies, to be protected against interest rate risk. In addition, the central bank launched the Growth Bond Programme (NKP) from 1 July 2019. Under the programme, the central bank will purchase HUF 300 billion worth of well-rated bonds issued by domestically based non-financial corporations, with the aim of boosting the domestic corporate bond market and strengthening monetary transmission, among other things.

During 2019, two of the major international credit rating agencies, S&P and Fitch, changed their assessment of Hungarian government debt. On 15 February S&P, while on 22 February Fitch, upgraded the Hungarian public debt rating from a previous BBB– positive outlook to a stable outlook, i.e. upgraded the rating of the Hungarian public debt. Several reasons for this move were mentioned by the two credit rating agencies: high growth prospects, reduced external vulnerabilities and a more stable banking system. Thus, the Hungarian public debt is in the category proposed for investment, in its second stage. Moody's maintains Hungarian government debt at a level lower by one category.

The foreign-currency ratio of Hungarian government debt decreased further last year, as after 20.0% at the end of December 2018, it was 17.3% at the end of December 2019, mainly due to the renewal of maturing foreign currency bonds with retail forint government securities. This ratio is in line with the 10–20% range target set in the 2019 financing plan.

During 2019, households increased their government securities savings significantly (by HUF 2,268.4 billion), by 39.25%, to HUF 8,047.1 billion, including higher demand for long-term securities. The introduction of the 5-year "MÁP+" on 1 June was the breakthrough in the significant rearrangement. This means that the population holds more than 30% of the total stock of government securities. The forint cash stock of households increased by 8.3%, or HUF 398.5 billion, to a lesser extent than last year. The loan portfolio of households increased by HUF 981.4 billion, to which an increase of almost 67% was due to the increase in consumer and other loans in HUF. Overall, the net financial assets of households increased by 11.7%, i.e. by HUF 5,341.3 billion, to HUF 50,931.8 billion.

The yield curve on the secondary government securities market shifted markedly downwards compared to the end of December 2018. Yields, which are still low at close to 0%, are due to loosen domestic monetary policy at the short end of the yield curve. Significantly shrinking longer-term yields were in line with the general, global declining trend in yields.

The stock of non-financial corporate loans increased by HUF 840.9 billion, or 11.3% (to HUF 8,299.4 billion) by the end of 2019, while the stock of retail loans increased by HUF 956.8 billion, or 15.6%, to HUF 7,107 billion, compared to the loan portfolio at the end of 2018. Within retail loans, consumer loans increased significantly by HUF 625.5 billion, or 26.6%, to HUF 2,980 billion.

Based on the MNB's quarterly time series on the credit institutions sector, the share of (non-performing) loans overdue for more than 90 days decreased in 2019 as a whole in both the retail segment and the corporate segment. In the corporate segment, the ratio of non-performing loans decreased by almost 1.29 percentage points to 4.23%, mainly due to portfolio cleansing, while growth in receivables sales and net income in the retail sector may also have contributed to the 3.0-percentage-points decrease in the NPL rate in one year, which thus amounted to 6.8%.

Examining the external balance, it can be concluded that external financing capacity accounted for 1.0% of GDP in 2019. The current account balance was in deficit (–0.8%).[5]

During 2019, the forint weakened against the euro: while at the end of December 2018 the euro was still worth HUF 321.51, at the end of 2019 it was already HUF 330.52. The weaker forint adversely affected public finances (despite the declining ratio of foreign-currency debt) and importing companies (typically domestically owned SMEs), while the population was hardly affected by its negligible foreign currency loans. However, it is important to mention that a persistently weak or weakening domestic currency may lead to higher inflation through import prices.

According to the preliminary cash flow data published in January, the central government subsystem closed with a deficit of HUF 1,219.0 billion last year. The central budget contributed to this with a deficit of HUF 1,023.8 billion, while the social security financial funds with a deficit of HUF 234.9 billion and the segregated state funds with a surplus of HUF 39.6 billion.

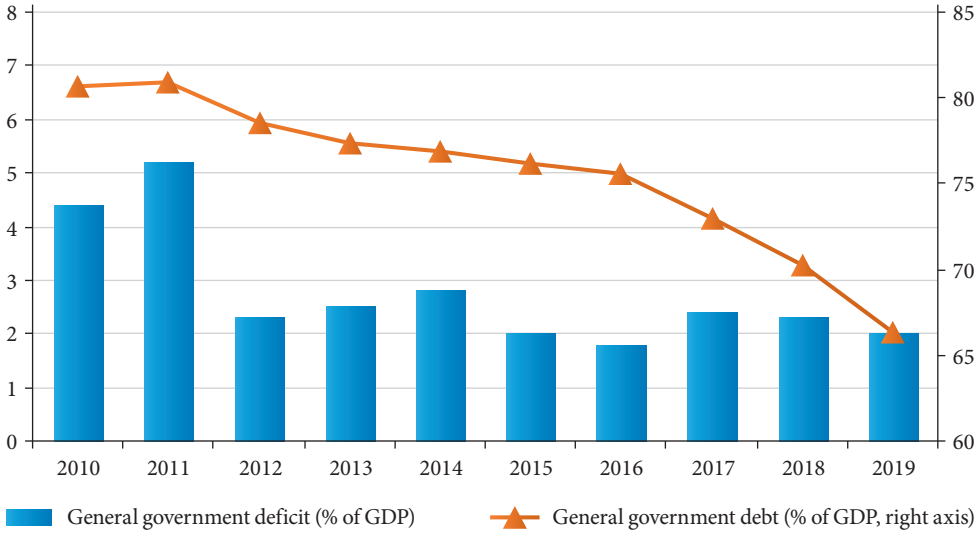
In 2019, the favourable real economic developments, the tax-revenue generating effect of the measures introduced under the six-year wage agreement, and the revenues related to EU projects determined the development of the revenue side of the central budget. As a result of the above processes, the accumulated revenue of the central budget was HUF 1,517.6 billion (7.6%) above the value of 2018, despite the fact that several measures affected items on the revenue side during the year (VAT reduction, abolition of tax advance supplementation obligation, etc.). For the whole of last year, the amounts received from consumption-related taxes increased by 13.5%, and retail payments by 11.2%, while the payments of economic entities decreased by 1.2% compared to 2018. In the case of consumption-related taxes, revenue from value added taxes increased by HUF 603.7 billion (15.4%) compared to the previous year. Within retail payments, personal income tax revenue was HUF 247.1 billion (11.3%) higher than in the previous year, driven by higher payments due to the higher wages. The underperformance of corporate payments was caused mostly by the abolition of the December corporate tax advance supplement, which resulted in a HUF 77.1 billion (20.3%) lower amount of corporate tax than in 2018.

Last year, as a whole, was characterized by higher-than-expected revenues and expenditures. The measures introduced by the Economic Protection and the Family Protection Action Plans, investments financed from domestic sources and the

[5] Post-study revisions improved external financing capacity to 1.6% of GDP and current account deficit to 0.3%.

pre-financing of European Union programmes played a significant role in the development of the higher-than-planned cash-flow deficit. Expenditures related to EU programmes amounted to more than HUF 1,500 billion in 2019, compared to HUF 1,251.4 billion in revenues. The deficit planned for the end of the year was exceeded by HUF 220.6 billion (22.1%), which was largely due to the HUF 1,710.3 billion (37.9%) overrun of the expenditures of budgetary bodies. According to the EU methodology, the accrual-based deficit as a share of GDP in 2019, although higher than the planned 1.8%, was 2.0%, thus it can be stated that Hungary has met the 3% Maastricht criterion for the eighth year now. Debt amounted to 66.3% of GDP at the end of 2019, according to MNB data, which is 3.9 percentage points better than in the previous year.

Figure 4
Government debt and deficit, 2010–2019 (as % of GDP)



Source: Eurostat.

PÁL BELYÓ[1]

Macroeconomic developments and public finances in 2019–20

The global economic situation that evolved by March 2020 fundamentally affected our catching-up process, that earlier could be considered positive. It is clear that a severe economic downturn cannot be avoided, but the scope of the effects of the worldwide coronavirus epidemic on the Hungarian economy remains completely uncertain. It is difficult to assess the real extent of its short- and long-term effects on Hungary.

Developments in the economy in 2019

In 2019, the Hungarian economy expanded slightly slower than before – by 4.9%. By the end of the year, the outstanding growth of the construction industry had slowed down, and the growth expectations of the industry had also weakened considerably. The deterioration of the balance was indicated by the fact that the pace of consumer price inflation accelerated slightly and the forint weakened further. At the same time, optimism among companies and households has decreased, on the one hand due to the risk factors causing the slowdown in the external economy – Brexit, the noticeable deterioration in the world economy and the slowdown in the growth of our foreign trade partners –, on the other hand due to domestic labour market anomalies.

Previous macroeconomic plans stated that the expansion of Hungarian GDP would decrease by 1.5–2 percentage points in 2020. In addition to a significant decrease in construction, a more moderate decline in industrial production and a significant weakening of investment, we could also expect a decrease in consumption due to the deterioration of income conditions. The 18–16% volume expansion of fixed capital formation since 2017 will slow down significantly to around 4% in 2020. The current account deficit was still compensated by the inflow of foreign direct investment in 2019, and we expected this in 2020 to the extent of around HUF 2.5 billion.

Inflation rose to a seven-year high by December 2019, and we forecast a similarly unchanged annual consumer price index of 3.6% on average for 2020. According to the MNB's intention, the base rate would not have been changed by the end of

[1] Eco-Vista Economic Services & Consulting.

2020 and the annual average of HUF/EUR exchange rate would have been 320.9, as planned in the Budget Act.

Public finance developments have been favourable. According to preliminary data, the general government deficit in 2019 amounted to HUF 958 billion, or 2.0% of GDP. Compared to 2018, the balance has improved by 0.1 percentage point of GDP. According to the MNB, the debt of the general government sector reached HUF 31,040 billion, or 66.3% of GDP, at the end of 2019. The revenue of the general government sector was HUF 20,588 billion and its expenditure was HUF 21,546 billion. Revenues increased by HUF 1,594 billion, or 8.4%. Production taxes increased the most – by HUF 677 billion, or 8.6%. Within this, the increase in VAT revenues reached HUF 397 billion, or 9.6%. Income tax revenues were by HUF 291 billion – 10.2% – higher than in 2018. Social security contributions increased by HUF 334 billion, or 6.4%. Other revenues increased by HUF 292 billion, or 9.5%. Expenditures increased by HUF 1,635 billion, or 8.2%. The increase was HUF 305 billion (12.2%) in the case of gross fixed capital formation and HUF 396 billion (11.6%) in the case of intermediate consumption. Employee income paid increased by HUF 255 billion, or 5.6%, and social benefits in cash increased by HUF 228 billion, or 4.7%. The increase was HUF 50 billion (4.9%) in interest expenses and HUF 402 billion (11.3%) in other expenses.

Even before the epidemic broke out, foreign central banks cancelled their tightening monetary policies to help their economies. At the same time, the pressure on the MNB to raise interest rates decreased, so the weakening of the forint became a natural consequence of the lack of monetary tightening. With the onset of the crisis, the average euro exchange rate of HUF 325 in 2019 may deteriorate above 350–360 by the end of 2020.

In 2019, the banking sector earned substantial profits. The share of corporate loans being overdue over 90 days or non-performing has already fallen to close to 2% as a result of the decline in recent years. The interest income, operating income and general result of the banks' management have also been continuously improving in recent years.

At the end of 2019, about 15% of the registered unemployed were young people under the age of 25, with two-thirds looking for their first job, but with few results. One third of the unemployed have no qualifications. A quarter of jobseekers are over 55 – in one of the most vulnerable age groups in terms of employment. The proportion of the unemployed in relation to the economically active population also reached – or even exceeded – levels one and half times higher than the national average in five counties: 9.7% in Somogy county, 9.3% in Szabolcs-Szatmár-Bereg county, 8% in Baranya county, 7.9% in Hajdú-Bihar county and 7.9% in Jász-Nagykun-Szolnok county.

There are significant extremes in earnings-income relationships. The gross average monthly wage in 2019 was HUF 656,100 in the financial and insurance activities, while in the field of accommodation and food service activities it was only HUF 238,100. It is estimated that the median wage in Hungary may be about 20% lower than the average wage. In other words, instead of the average salary of HUF 268 thousand in November without discounts, the median salary is HUF 215 thousand, and even taking into account the tax benefits, only HUF 221 thousand.

The improving situation of the upper income decile is indicated by the fact that according to the data of the Public Debt Management Centre, by the end of 2019 the population already held more than HUF 9,000 billion worth of government securities, an increase of 20% since the beginning of the year. The higher yield on government securities (MAPP) since early summer has boosted and restructured savings, naturally curbing with this the economic expansion. The deposit portfolio of the populace exceeded 9.5 thousand billion HUF, while its loan portfolio amounted to more than 7 thousand billion.

There has also been a large increase in the amount of taxes paid by households. Households paid about 10% more income-type taxes and 13% more consumption-related taxes compared to the previous year. VAT revenues rose about 16% and excise tax revenues were about 6% higher than before.

According to business cycle reports, by the end of 2019 corporate business indicators did not deteriorate despite declining business expectations. Overall, industrial production remained at the same level. However, construction output declined, the amounts of construction contracts being much lower at the end of the year than a year earlier.

For the whole of 2019, the average number of employed persons was 4,512 thousand, the employment rate among those aged 15–64 was 70.1%, and unemployment fell to 3.3% by the last quarter of 2019. This is one of the best values in the EU, and the rate below 6%, including public workers (people working under a specific scheme aimed at mitigating unemployment), is better than the EU average. However, structural tensions in the labour market have remained unchanged. The impact of persistent labour market difficulties has been felt in the weakening economy.

Developments in the economy in 2020

The coronavirus, which appeared in 2020, has triggered a worldwide crisis that was deeper and completely different from previous ones. Hungary was not left untouched by the adverse effects either. It was expected that the economic effects would be profound as soon as the emergency occurred. In addition to the slowdown in growth, unprecedented restrictions were introduced in all segments of society, and fear among workers and the population was growing.

The changes caused by the coronavirus epidemic resulted in a severe decline of the GDP and forecast an uncertain recovery for the coming years.

The outstanding growth of the expansion has stopped in almost all sectors, as did industrial performance that is essential for our exports. The further deterioration of the balance is indicated by the fact that the pace of consumer price inflation is accelerating, the forint has weakened further and is constantly weakening. In addition to declining employment, declining family incomes can also be a huge concern.

Based on the second quarterly flash estimate of the Central Statistical Office, the GDP decreased by 13.6% compared to the same period last year. As a result of the emergency situation caused by the epidemic, the output of most branches of the national economy fell, mainly due to the deterioration in performance in the services

and industry sectors. The performance of the national economy declined by 6.1% in the first half of 2020, and the downturn indicates an even more unfavourable situation than stated in our April "crisis forecast". As in other European countries, this year's general government deficit will increase significantly.

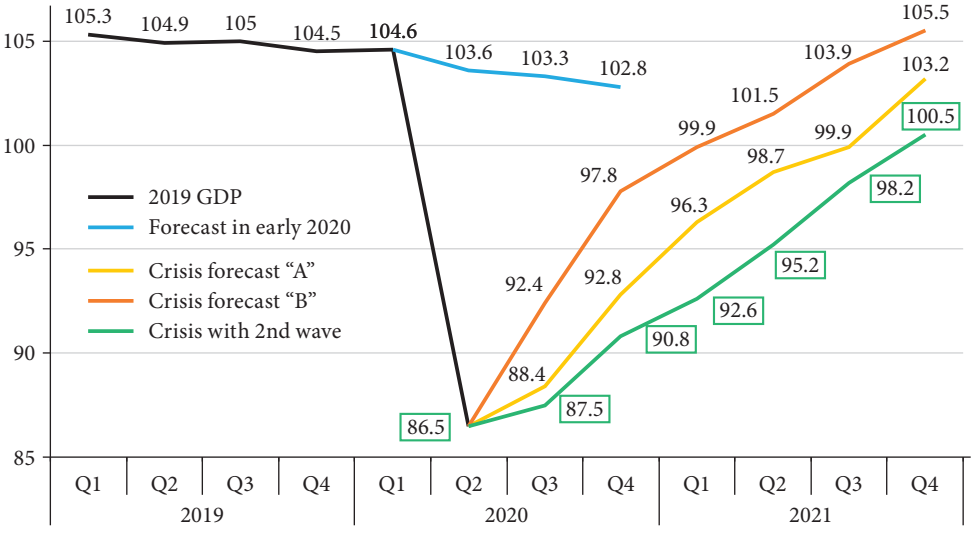
The pandemic radically changed the plans as well…

From March 2020, the global economic situation caused by the coronavirus epidemic has fundamentally affected our catching-up process, which could be considered positive before.

In the EU member states, the forecasts are very pessimistic, and this will also determine the demand for Hungarian exports. Hungarian economic rescue measures will only be able to mitigate the decline in GDP in the second half of 2020. Presumably, the decline in the second quarter may be followed by a decline in GDP of around 5–7% in the second half. Thus, on an annual basis, the decline in gross domestic product could be between 8% and 9% and the level of GDP in 2019 can probably be reached only by 2022.

OECD forecasts are more pessimistic than those of the IMF: depending on whether there is a second wave of the epidemic, which is very likely, it is estimated that the world economy will contract by between 6% and 7.6% in 2020, and will only grow by 2.8–5.2% in the next year. Necessary measures to help economies – monetary easing, leniency in tax collection, loan subsidies – mean a serious increase in budget spending everywhere. Thus, these measures will lead to a significant increase in previously planned deficits and even close to one tenth of GDP in 2020.

Figure 1
GDP forecasts, volume change compared to the same quarter of the previous year (%)



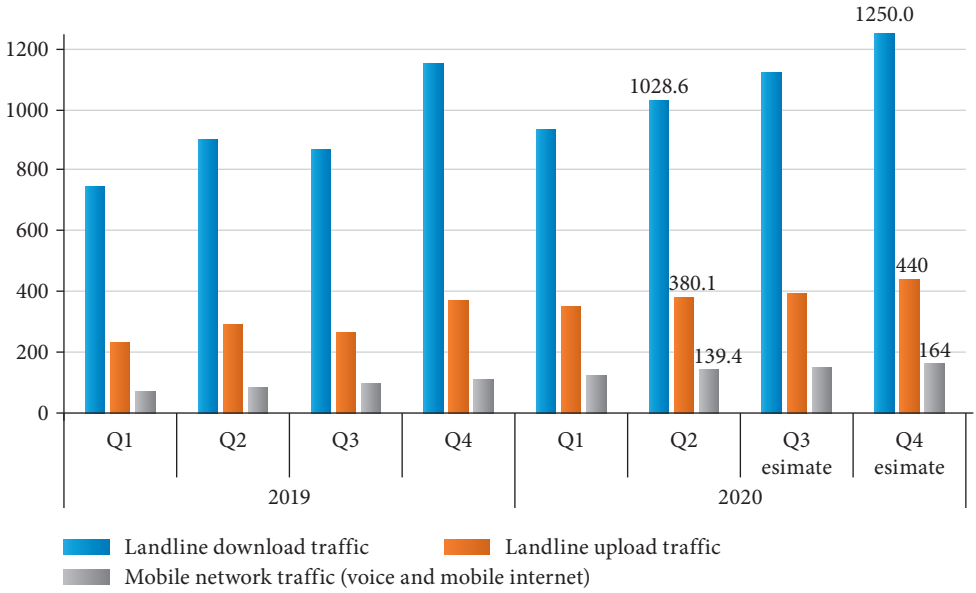
Source: CSO.

Helping businesses is essential

Since the outbreak of the coronavirus epidemic in March, corporate management indicators have deteriorated significantly. Industrial production fell by 12.8% in the first half. The volume of exports, which accounts for two thirds of total sales, decreased by 13.6%, while domestic sales decreased by 7.7%. Industrial production increased only in the Northern Great Plain (by 0.9%), but its decrease in the other regions varies between 2.9 and 21%. It could have fallen by almost 25% in Western Transdanubia. Compared to the previous month, even in June, there was a 12.2% decrease in production and presumably a 12–15% decrease in production on an annual basis. The fall in the construction industry is similar, as the contract stock is much lower than a year ago.

As a result of the epidemic, investment may fall at a higher rate than GDP, by about 10%, which is likely to lead to an investment rate of around 27%. Although significant amounts and cheap resources support the development of companies, the size and structure of demand this year is also uncertain, and a significant number of companies are postponing their previously planned investments. In addition to the construction of road and railway investments and the preparation of Paks-2 (a major extension of Hungary's only nuclear power plant), the development of tourism investments, the construction of sports facilities and the modernisation process of the army are secure projects.

Figure 2
Landline and mobile network traffic (Petabyte)



Source: CSO.

During the crisis, significant changes took place in the labour market. The specific working conditions of employment have changed, and the actual income processes have changed in a not yet measurable way due to the home-office, reduced working hours, unpaid leave and fourloughs. Internet use has increased significantly in all areas of the economy and society. The form of communication has been completely transformed; even primary school education often takes place on web platforms.

The number of employees averaged 4,408,000 in the second quarter, lower by 103,000, or 2.3%, than a year earlier. Considering those working abroad as domestic employees, the employment rate of the population aged 15–64 was 68.7%, which is 1.3 percentage points lower than in the previous year. In the second quarter, the number of active unemployed was 214,000. Compared to a year earlier, it is by 59 thousand people, or 37.7%, more. The unemployment rate calculated on the basis of the recruitment methodology was 4.6%, 1.3 percentage points higher than a year ago. The unemployment rate of 14.7% for those under 25 is high, up 4 percentage points from a year earlier.

The specific development of gross earnings is difficult to judge, but the decline in the previous rate of improvement is indicated by the fact that after the 9.1% growth in March compared to a year before, PIT revenues increased by only 5.5% in April. The temporary nominal decline in earnings in some parts of the economy can halt from July, provided that the economy will not be shut down as it was in the spring. Based on the expected development of economic performance this year, a decline in employment of around 3% and thus an unemployment rate of 6% can be assumed.

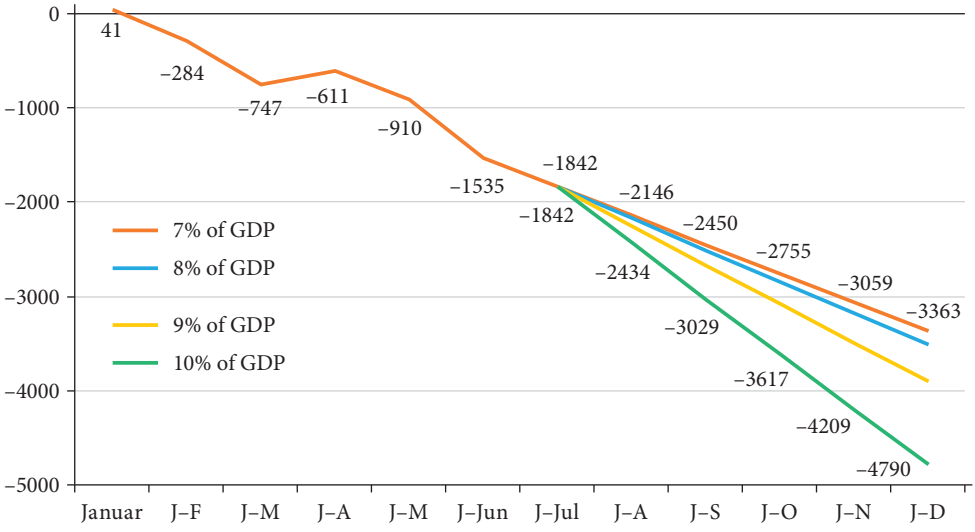
High inflation and significant fiscal expansion – growing budget deficit

Financial indicators also deteriorated sharply compared to the previous quarter, not only because of the fundamental difficulties caused by the pandemic, but as a result of measures to address the crisis as well. Inflation rose to 3.8% by July 2020, while core inflation rose to an eight-year high of 4.5%, and could be above 5% on an annual average.

As a result of the crisis, the government raised the general government deficit target to 3.8% by the end of the first half of the year, but it was expected that due to higher budget expenditures and much lower-than-expected GDP, the general government deficit can be higher (7–9%) or it can even reach 10%. (In the course of financing, the use and assessment of so-called helicopter money can be re-evaluated worldwide.)

The gross consolidated debt of the general government, previously forecasted at 66.3% by 2020, will clearly increase to over 80%, as it had already risen to 71.9 percent of GDP by the end of June. Due to the budget deficit, the central government debt increased by HUF 1,500 billion in the second quarter, the budget closed with a deficit of HUF 1,837 billion in six months, and even reached HUF 2,165 billion by the end of July. It is partially funded by the € 3.5 billion foreign currency bond issuance in early spring and the fact, that instead of the bi-weekly auctions, bonds are

Figure 3
General government balance – monthly forecast (billions HUF)



Source: CSO.

auctioned weekly points to the increasing need for finances. (MoF indicated that due to tax cuts and declining economic performance, this year's decline in general government revenues may exceed HUF 1,400 billion!)

The MNB cut the base interest rate to 0.75% in June and then again to 0.6% in July, i.e. further loosened its monetary policy. The forint exchange rate has been weakening for a long time, from the average exchange rate of HUF 275.4/euro in 2010 to the expected exchange rate of HUF 350/euro by the end of 2020, meaning a 25% depreciation (which can further deteriorate, should another epidemic happen). The base rate will certainly be raised from its long-standing low level, although monetary tightening is unlikely to help strengthen the forint. For employers, an 8% increase of the wage-costs means much lower, sometimes unchanged wages for foreign companies in terms of the strengthening euro. The weakening domestic currency affects adversely also Hungarian salaries, which are already losing their real value due to rising inflation.

As a result of the crisis, the current account balance could reach a deficit of up to € 3 billion in 2020, following last year's deficit of € 1.2 billion. Several previously announced foreign investments that were postponed due to the crisis in the spring, are likely to resume in the second half of the year.

The determinant of foreign trade activity will be that both exports and imports will fall by 4–5%. And the 18–16% volume expansion of fixed asset accumulation since 2017 will slow significantly in 2020, to around 4%. The current account balance of € 3.5 billion in 2019 will continue to decline by 1–1.5 billion, also taking into account the decrease in the investment-stimulating effect of EU subsidies and the slowing increase in the purchasing power of households.

Situation of households precarious…

Household indicators also show serious livelihood difficulties for families. The economic effects of the epidemic pose a serious threat, as in the absence of substantial financial support, the lives of families who have been living in relative security will become extremely hard, due to the lack of income because of mass unemployment. Since the outbreak of the epidemic, more than 200,000 people have lost their income or earn significantly less, exhausted their meager savings, thus losing their financial security.

This year, the significant increase in consumption, characteristic for recent years, will slow down, since its major causes – the impact of the dynamic wage increase, credit expansion and high consumer confidence established by the family protection programme – will decrease. The growth has already been curbed by high housing construction and maintenance costs, the high level of housing rents and the inflation process that has started.

Table 1
Forecast for 2020–21 (previous year = 100%)

	2019	2020		2021
	factual	forecast		prognosis
		February	September.	
GDP	104.9	97.8	92.5	96.5
Industrial production	105.4	98.5	91.5	98.5
Construction production	123	104	98.4	103.5
Retail turnover	106	103	102.0	103.2
Fixed asset accumulation	116	96	92.4	104.2
Gross earnings	111	106	5.4	6.8
Inflation	103.4	104.6	5.2	4.4
Deficit	102.1	102.8	92–90	94–92
HUF/EUR exchange rate, HUF	325.4	340–350	365	355
Imports	105	105	98	101
Exports	104	101	95	99
Unemployment, %	3.3	4.5	6.5	5.5

Source: CSO.

The average gross earnings of full-time employees in the national economy in the first five months were HUF 390,000, 8.8% more than a year ago. The average salary in the private sector was HUF 406,700, which was also 8.8% higher than a year earlier. Excluding the wages of public employees, the average earnings in budgetary institutions were HUF 387,600, 7.9% higher than a year earlier.

The average net earnings of those employed were HUF 259,300 in the first five months, while real earnings increased by 5.1%. In the private sector, the average net

earnings of HUF 270,500 measured in the first five months increased by the same amount as the gross one, by 8.8%. In the case of budgetary institutions, excluding the wages of the so-called public workers, the average net salary of HUF 257,700 increased by 7.9%.

Due to declining employment, average earnings may increase by around 5% in 2020, but real earnings by only 1–2%. Pensions are clearly losing their real value as no pension premium (that is compulsory contingent on a GDP growth exceeding 3.5%) will be paid out this year and the pensioner price index is higher than the average consumer price index. By the end of 2020, although declining, yearly inflation is expected to be around 3%, but can even be above 5%. As a result, household consumption is likely to fall by around 2.5% this year.

* * *

The depth and duration of the epidemic in mid-2020 is still uncertain. Strict restrictions on the movement of the population necessarily lead to a decline in economic processes and a recession. The outlook is determined by a high degree of uncertainty as global production processes and demand are declining. With the prolongation of the second wave, the decrease in the number of employees could be 350–400 thousand people periodically, and it affects almost all sectors. Some of the companies that employ skilled workers and produce normally marketable products and services try to retain the workforce with various wage-cutting techniques, while organizations with insufficient capital strength lay off their workers. Employees of SMEs and the self-employed are particularly at risk.

It is necessary for the government to continue to grant temporary tax leniency (including payroll taxes) to companies, in order to support them in retaining their employees and paying their wages. Important structural changes in the economy and the adjustment of the budget are also inevitable.

BALÁZS CSOMÓS–GERGELY KICSÁK–
EMESE KREISZNÉ HUDÁK[1]

Fiscal processes of 2020

As in other countries, the coronavirus pandemic fundamentally overwrote the economic and budgetary outlook in Hungary. The 2020 Budget Act, passed in July 2019, set the ESA deficit at 1% of GDP with reserves equivalent to 1% of GDP. Thanks to a lower-than-ever deficit target and high reserves, there was considerable room for maneuver in the budget to deal with the health and economic effects of the pandemic. As a result of government measures and lower-than-planned tax revenues, we forecast that in 2020 the general government deficit will be 7.0–7.5% of GDP. The emergency situation will break the decline in the debt ratio, that went on since 2011, and the debt-to-GDP ratio could rise from 65.4% at the end of 2019 to 76% by the end of 2020 but is expected to decline again in the coming years. In international comparison, this year's deficit is average, while debt growth may lag behind the EU and regional average, as Member States have embarked on a large fiscal stimulus to address the crisis, causing a significant increase in deficits this year.

Developments of macroeconomic conditions in 2020

The coronavirus pandemic has led to a significant economic downturn that has affected almost every country in the world. As a result of the pandemic, European states experienced one of the deepest economic downturns in their modern history in the second quarter of 2020. The economic performance of the euro area decreased by 14.7% compared to the same period last year, within which the economy of our main foreign trade partner, Germany, shrank by 11.3 perc ent. Public budgets have been able to mitigate the negative effects of the pandemic with strong counter-cyclical policies. In European countries, in addition to differences in the structure of the economy, the decline in GDP was more modest where they were able to at least partially offset the falling aggregate private demand by boosting public demand. The size and

[1] The Central Bank of Hungary (Magyar Nemzeti Bank – MNB) regularly supports the work of the Fiscal Council with the publication of the Public Finance Report. Our study was prepared on the basis of said publication.

composition of the stimulus programs varied, but second-quarter economic performance was mainly driven by direct and targeted fiscal stimulus.

In the first half of 2020, according to the decline in GDP, Hungary was in the middle of the range of EU Member States. In Hungary, the economic effects of the first wave of the pandemic were concentrated in the second quarter. Taking the first two quarters together, the performance of the domestic economy does not deviate from the regional average and exceeds the dynamics of the euro area economy by more than 3 percentage points. On the consumption side, domestic household consumption performed favorably in the first half of the year, with a decline of only 1.6%, the third smallest in the EU after Bulgaria and Slovakia. Domestic consumption was supported by the credit moratorium, which is one of the most extensive internationally, the steadily rising household income and savings of recent years, and the labor market situation, which showed only a moderate deterioration during the first wave. In contrast, government consumption, gross fixed capital formation, and declining exports were in line with EU countries.

The impact of the pandemic on the Hungarian economy was exacerbated by the fact that it affected the three areas that accounted for a significant share of economic growth in recent years: the automotive industry, tourism and investments. The strong exposure of the Hungarian economy in the automotive industry and tourism has changed from an advantage to a disadvantage due to the nature of the coronavirus crisis. Investments have generally been postponed due to the uncertain economic outlook. On the consumption side of GDP, investment has accounted for 75–80% of growth over the past 2 years, however, in the current uncertain economic environment, corporate and retail investment decisions may be characterized by a wait-and-see approach. This process was not dampened by public investment in the first half of the year either, so it became one of the most important growth factors, the biggest pull factor. Contributing to the negative impact is the fact that the housing market cycle also reached its maximum last year.

Despite the significant contraction of the economy, there were no signs of a stronger downturn in the labor market; as companies responded to the changed conditions by reducing the number of hours worked and promoting part-time solutions. Domestic employment rose in June and July, following a low in April. In July 2020, the number of people employed in the national economy was 4,460,000, which is only 65,000 less than a year earlier. Due to the relatively favorable labor market situation and the general lending moratorium, household consumption has developed favorably in international comparison.

In the case of Hungary, the budget deficit of 7.0–7.5% of GDP expected for 2020 is average in the EU. Governments themselves expect the general government deficit to rise to an average of 8.4% of GDP in the EU and 9.8% of GDP in the V3 countries by 2020. Member States have embarked on large-scale fiscal stimuli to address the crisis, which, together with the economic downturn, has caused a significant deterioration this year. The deficit could be exceptionally high in the United States, where a deficit of 18% is expected this year, and in the United Kingdom, where the deficit could be around 16% of GDP.

Fiscal balance in Hungary in 2020

The expected development of the fiscal balance this year

The 2020 Budget Act, passed in July 2019, set the ESA deficit at 1% of GDP with reserves equivalent to 1% of GDP. Thanks to a lower-than-ever deficit target and significant amount of reserves, there is sufficient room for maneuver in the budget to address the health and economic effects of the pandemic.

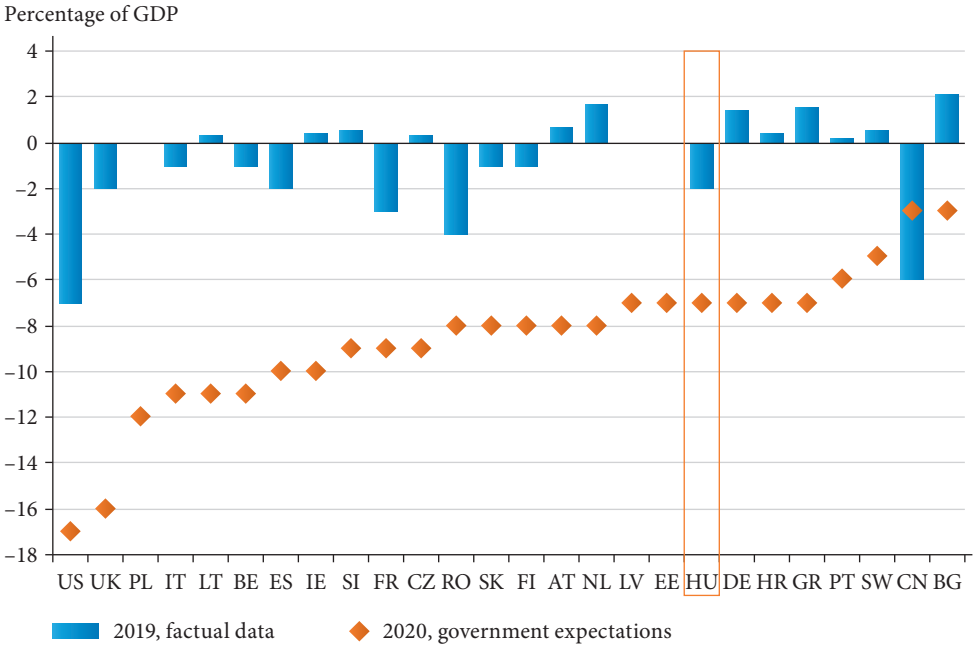
According to our forecast, the general government deficit in 2020 could be 7.0–7.5% of GDP. The budget deficit may be substantially higher than in previous years, or it may significantly exceed the budget appropriation containing a deficit of 1.0% of GDP. The discrepancy is a consequence of the coronavirus pandemic that appeared in Hungary during this year, as well as the significant economic downturn that unfolded after that. Both the decrease in revenues and the significant increase in expenditures will contribute to the increase of the budget deficit in 2020.

Revenues from taxes and contributions on the central subsystem of the budget will be significantly lower than the related appropriations this year, mainly due to the unfavorable macroeconomic effects of the coronavirus pandemic. In the case of tax and contribution payments, the deviation from the appropriation can reach up to HUF 1,300 billion. The most significant declines are in consumption taxes and taxes and contributions on labor: the growth dynamics of taxes fell to a multi-year low already in the first half of the year, which can be partly explained by the tax revenue-reducing effect of targeted measures to mitigate the effects of the pandemic. The subsystem's tax and contribution revenue for the first eight months amounted to only 60% of the appropriations. The substantial decline in tax payments is partly offset by the fact that revenues from EU subsidies exceeded appropriations.

According to our forecast, the cash expenditures of the central subsystem of general government may be substantially higher than the appropriations of the Budget Act, by almost HUF 2,300 billion. The increase in expenditures is mainly explained by the additional expenditures related to epidemiological control, which is also reflected in the expenditures of the central budgetary organizations and the Health Insurance Fund. Additional expenditure in excess of the appropriation is the budgetary impact of measures to offset the negative economic effects of the coronavirus pandemic, such as expenditure related to employment promotion and job retention programs. The additional expenditure is covered on the one hand by transfers within the budget and the use of reserves, and on the other hand by part of the impact of the measures increasing the budget deficit.

Measures with a direct budgetary impact may amount to 7.3% of GDP, a significant part of which may be covered by transfers, the use of reserves, tax increases (special retail tax, contributions from financial institutions) and reallocations of EU funds. We estimate that the net balance effect of the measures could be 3.2% of GDP (Box 1). The slowdown in the economy will significantly reduce tax revenues compared to the planned ones, which may be a total of up to HUF 1,300 billion (2.8% of GDP) below the statutory appropriation.

Figure 1
Government expectations about budget deficits, as % of GDP



Note: For the US, the European Commission's May forecast is included.
Source: European Commission (2019), MNB data collection (2020).

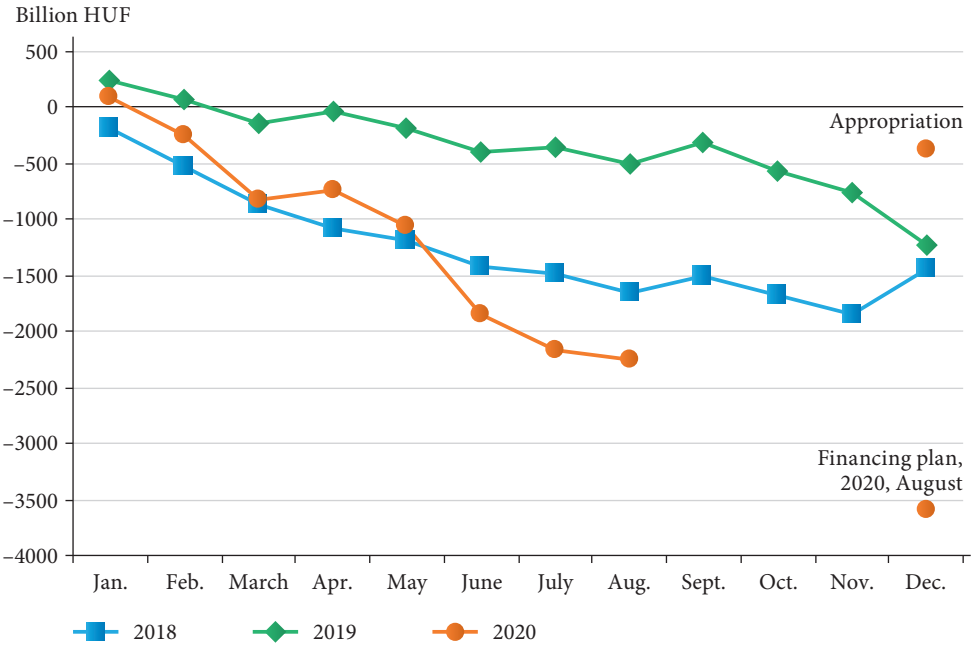
In parallel with the recovery from the crisis, the general government deficit in 2021 may reach 3.1% of GDP in the European Union and 5.6% of GDP in the Visegrad countries, according to government expectations. EU Member States' budget balances are projected to improve significantly in 2021 compared to the previous year but are not expected to reach pre-crisis levels next year.

Presentation of data related to budgetary processes in 2020

The cumulative deficit of the central subsystem was HUF 2,261 billion at the end of August, which means a higher deficit than in the first eight months of previous years (Figure 2). The tax and contribution revenues of the central subsystem fell short of the first eight months of last year by HUF 42 billion, which was offset by the high development of revenues related to European Union funds and the revenues from the concession sale of mobile frequencies. Total expenditures of the central subsystem were approximately HUF 2,150 billion higher in the first eight months of this year than in the same period of the previous year. Most of the expenditures can be attributed to the central budgetary organizations, as well as to the expenditures related to the European Union programmes, but the net cash interest expenditures of the budget and expenditures on medical-preventive care were also significantly

higher than that of the last year until August. The intra-year increase in the cash deficit slowed down temporarily in the third quarter, but we expect the deficit to increase again in the last quarter of 2020.

Figure 2
Cumulated cash balance of the central subsystem

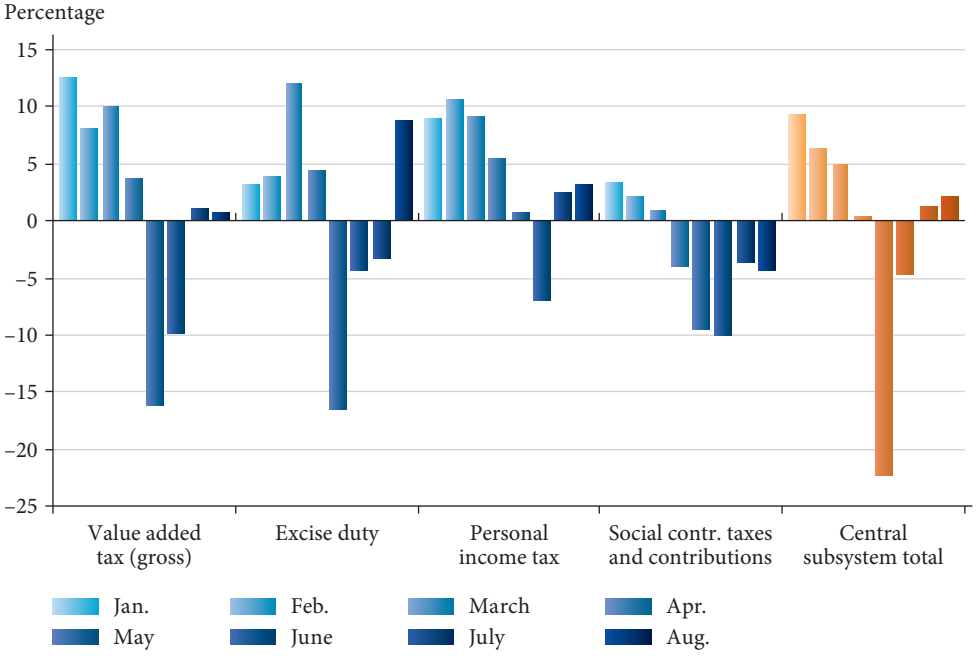


Source: Budget Act of 2020, Government Debt Management Agency Pte. Ltd. (ÁKK) plan of August 2020, Hungarian State Treasury.

Following the low point in May, tax revenues increased substantially, however, the pace of growth was lower than previously. Tax and contribution revenues of the central subsystem of the budget increased by 1.3% in July and by 2.1% in August compared to the same months of the previous year.

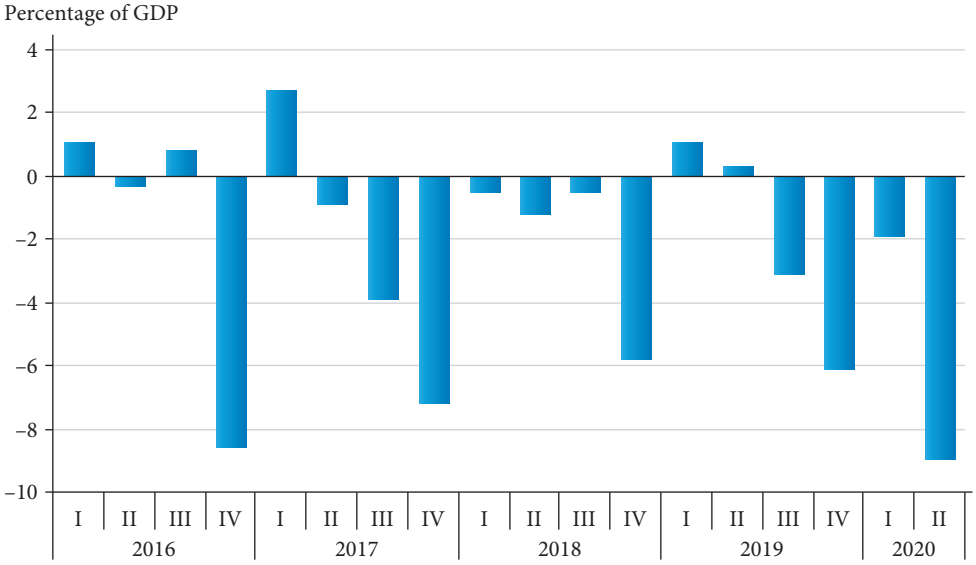
The general government accrual-based balance showed a deficit of 5.3% of GDP in the first half of 2020. In the first quarter, revenues increased temporarily, mainly due to consumption and production tax revenues, but in the first half of the year overall they decreased by 1.4% compared to the same period of the previous year. Expenditures in the first six months of this year rose by 12.6% from the same period last year. In the first quarter of 2020, the general government deficit was only 1.9% of quarterly GDP, rising to 9.1% in the second quarter. The budget balance in the first half of the year was almost HUF 1,400 billion lower than in the first half of 2019, or 6 percentage points of GDP.

Figure 3
Monthly change in the main tax and contribution revenues of the budget compared to the same period of the previous year



Source: Hungarian State Treasury, MNB.

Figure 4
Accrual-based quarterly balance of the budget



Source: Hungarian Central Statistical Office (HCSO), National Bank.

Government measures taken to mitigate the economic effects of the coronavirus

The budgetary impact of measures to control the coronavirus pandemic and address its economic impact could reach 7.3% of GDP in 2020 (Table 1). The main goal is to support the healthcare related measures and the main objectives of the Economic Protection Action Plan: job retention and job creation, targeted support for sectors adversely affected by the pandemic, and economic restart. Funding measures amount to 4.1% of GDP, so the net deficit-increasing effect could be 3.2% of GDP in 2020. The government intends to cover a significant part of the measures of the Economic Protection Action Plan from realloaction of funds within the budget, the use of reserves, revenue-raising measures (special retail tax, contributions from financial institutions) and the rearrangements of EU funds.

Table 1
Summary of estimations of the fiscal effects on the budget of the measures taken in relation to the coronavirus

Expenditures	billion HUF	GDP %
Health expenditures related to the pandemic	801	1.7
Tax cuts and family support measures	409	0.9
Economic protection programmes	1860	4.0
Job protection, job creation, developments	335	0.7
I. Total expenditures	3405	7.3
Revenues	billion HUF	GDP %
Budget transfers in the 2020 budget	1451	3.1
Revenue-raising and reallocation measures	125	0.3
Redeployment of EU funds	335	0.7
II. Total resources	1911	4.1
III. Estimated impact on the budget balance (II.-I)	–1494	–3.2

Note: The Economic Protection Programs include government decisions taken at the expense of the Economic Protection Fund up to and including 21 September 2020.
Source: Amendment of the 2020 Budget Act, Magyar Közlöny, MNB.

In 2020, the government may spend a total of HUF 801 billion on health protection, the purchase of health care equipment and the salary supplement for health care workers, which corresponds to 1.7% of GDP. At the beginning of July 2020, a gross one-time salary supplement of HUF 500,000 was paid to 170,000 healthcare workers, the budgetary impact of which, including contributions, totaled HUF 101 billion. In addition, the previously decided increase in the salaries of health care workers means an additional HUF 82 billion expenditure in the budget.

The budgetary impact of the tax reduction measures provided under the Economic Protection Action Plan may total HUF 409 billion, which corresponds to 0.9% of GDP

(Table 2). In the targeted sectors[2], companies were relieved of their public burdens for March-June and the obligation to pay rehabilitation contributions was suspended for March-June. Employees were exempt from paying pension contributions and received a discount on health insurance contributions. Leases from companies in the same sectors could not be terminated by the end of June, and rents could not be raised. In addition, the lump sum tax of small entrepreneurs (KATA) for 151,000 businesses was suspended until July, and taxpayers of small business tax (KIVA) could decrease their tax liability with personal expenses between March and June. From March to the end of 2020, the *tourism development contribution* and the *tourist tax* were also suspended. The amount of the *SZÉP card* with reduced taxation has been increased to HUF 800,000 in the private sector and to HUF 400,000 in the public administration, and no social contribution tax will have to be paid until the end of the year for the benefits paid to the card. In addition, the obligation to pay water resources contributions to most taxpayers in agriculture has been suspended. The fact that the previously announced *2 percentage point reduction in social contribution tax* was implemented from July 2020 means a tax exemption amounting to HUF 160 billion.

Table 2
Tax cuts and family support measures in 2020 (billion HUF)

Tax cuts and family support measures	billion HUF
Another 2 percentage point reduction in social contribution tax	160
Municipalities' annual VAT return	60
Employer and employee contribution rebate for beneficiary sectors until 30 July	61
Release of the obligation for certain services taxable according to KATA until 30 June	26
SZÉP card measures	44
Suspension of the tourism development contribution until 31 December	36
Exemption of beneficiary sectors from vocational training contribution tax until 30 June	4
Rehabilitation tax exemption for beneficiary sectors until 30 June	3
Preferential KIVA obligation in some sectors until June 30	2
Excise-duty free production of disinfectants	1
Extension of GYED and GYES supports that expired during the emergency	11
Total tax reductions and family support measures	409

Source: Ministry of Finance, MNB.

Protecting families and pensioners is also a top priority. In order to support families and pensioners, evictions, seizures, tax expulsions and KATA tax arrears have

[2] Targeted sectors include, for example, tourism, hospitality, entertainment, film, travel, event management, inland waterway passenger transport, and sports, media and physical services.

been suspended until the end of the emergency. Eligibility for *childcare allowances* (GYES, GYED, GYET) was extended until the end of the emergency. In addition to households, the situation of companies is also assisted by the *moratorium on loan repayments* until the end of the year. The MNB estimates that the measure currently affects about 1.6 million debtors of the population and 60,000 corporate debtors and could leave up to HUF 2,000 billion in disposable income by the end of 2020. The Government's September 2020 decision extended the moratorium on loan repayments for another six months, until June 30, 2021, for those raising children, retirees, the unemployed, and the public. In addition, businesses can take advantage of the loan repayment moratorium if their income has decreased by more than 25%. With the extension of the moratorium, retail and corporate customers can be exempted from paying a total of approximately HUF 600 billion in installments in the first half of 2021.[3]

It will significantly increase the income of pensioners that the *13th month's pension will be gradually reintroduced from 2021:* in February 2021 the pensioners will receive an extra 25% of their January pension, then in 2022 50%, in 2023 75%, while *in 2024 and beyond, retirees will receive full, one-month bonus pension.* The first budgetary impact of the measure in 2021 is HUF 80 billion, which will gradually increase every year, so in 2024 the total impact could be 0.6% of GDP. These values include the fact that, in addition to old-age pensioners, all those receiving pension-like benefits will receive an additional benefit of one month.

The government will provide a total of HUF 335 billion in funds for job protection, job creation and development by reallocating EU funds. The wage subsidy for job protection and the wage subsidy for those working in research and development, as well as the job-creating wage subsidy, provided assistance for the employment of a *total of 280,000 employees.* Under the *wage subsidy* for part-time employees, 70% of lost wages were paid by the state for 3 months. About 18,000 enterprises applied for job protection wage subsidies to employ 207,000 employees, which means about HUF 35 billion as expenditure in the budget. Those employed in *research and development jobs* receive a 40% wage subsidy (maximum HUF 319 thousand / person / month), for which a budget of HUF 32 billion has been set. A total of about 1,300 companies applied for the research and development wage subsidy, and it was used for 23,000 employees, which means a HUF 17 billion need for subsidy. Within the framework of the *job creation wage support program,* the state reimburses the employer HUF 200,000 per month during the first six months, after which the employee must be employed for another 3 months. The support can also be claimed by companies that have laid off part of their workforce due to the crisis but are now recruiting workers again. A total of 37,000 companies applied for the job creation wage support program, and employers were able to hire 49,000 jobseekers as a result of the program. In addition to job protection and job-creating

[3] Nagy, Tamás–Virág, Barnabás (2020): Minden eddigi számításnál kedvezőbb lehet a moratórium meghosszabbításának hatása. https://www.mnb.hu/letoltes/nagy-tamas-virag-barnabas-hitelmoratorium-meghosszabbitasa.pdf.

wage subsidies, the *government provided support to a total of about 1 million people,* taking into account other support elements of the Economic Protection Action Plan (e.g. contribution reductions, adult training).

The budget supports economic protection with significant resources. The government originally allocated HUF 943 billion to the Economic Protection Fund through transfers within the budget, however, expenditures have been higher. The use of the resources in the Fund started from the second half of April and the amount of the used resources exceeded the expenditure limit at the end of June. When the 2020 Budget Act was amended, it was decided that the expenditures of the Economic Protection Fund may exceed the planned budget. By 21 September 2020, the government paid a total of HUF 1,860 billion through the Economic Protection Fund, which corresponds to 4% of GDP. The Fund's expenditures also support the relaunch of the economy, as it can also finance a significant amount of *public investments*. *Competitiveness-enhancing subsidies* amounting to HUF 199 billion are also part of the expenditures of the Economic Protection Fund. The possibility of applying for the first round of funds closed at the end of May, but in September application submissions were reopened up to the unused amount. In the first round, by the end of May, a total of 806 applications were received, the amount of support requested may be HUF 179 billion, and the total value of investments under the program may be HUF 377 billion. Competitiveness-enhancing subsidies protect a total of 155,000 jobs in 30 industries and enable the realization of HUF 425 billion in new investments.

The financing of companies is also supported by capital and guarantee programs, the total amount of which is HUF 2,100 billion.

The government can cover a significant part of the announced measures from reallocations within the budget, the use of reserves, revenue-raising measures and the transfer of EU funds. In 2020, revenue-raising measures may amount to HUF 125 billion. The tax on financial institutions will be increased by HUF 55 billion, which can be deducted from their tax liabilities in the next five years. A special retail tax with a progressive tax rate was also introduced. The subjects of the tax are retail stores as well as car and fuel retailers. The budget is expected to generate HUF 36 billion in revenues with this measure. The part of the motor vehicle tax that was previously related to local governments was redirected to the central budget

The budget transfers and the use of the Country Protection Fund together represent a fund-raising measure of HUF 1,451 billion. Within this, the savings of central institutions and programs amounted to HUF 943 billion, the use of the Country Protection Fund for mitigating the effects of the pandemic amounted to HUF 378 billion, while the previously decided increase in the salaries of health professionals and nurses amounted to HUF 82 billion. In addition, HUF 1.3 billion was transferred from politicial parties' subsidies and HUF 47 billion from municiapilites' expenditures to control the pandemic. Another source of funding is the reallocation of HUF 397 billion sin EU support to programs to mitigate the economic effects of the pandemic. This means that EU funds that were already planned to use are being redirected for other purposes (thus, there are no additional funds involved).

Gross public debt developments

According to MNB data, gross government debt as a share of GDP was 70.3% at the end of the first half of 2020, which represents a substantial increase of 4.9 percentage points compared to the 65.4% level at the end of 2019. Compared to the same period last year, the debt ratio increased by 3.2 percentage points. In the first half of the year, in addition to net debt issuance, the revaluation and the slowdown in economic growth also raised the value of the debt ratio. The foreign exchange ratio of central government debt increased from 17.3% at the end of 2019 to 19% by the end of the first half of 2020 due to foreign currency issuances. Within the total government debt, the share of foreigners decreased from 33.9% at the end of last year to 33.7% in the first half of the year.

In 2020, the fact that the MNB paid a historically high, HUF 250 billion or a 0.5% of GDP dividend to the budget supported general government finances and thus, the reduction of public debt. Major part of the 2019 profit, HUF 250 billion, was paid to the budget as a dividend. The 250 billion contribution will help financing outstanding debt, and of this amount, HUF 48 billion (0.1% of GDP) will improve the accrual budget balance.

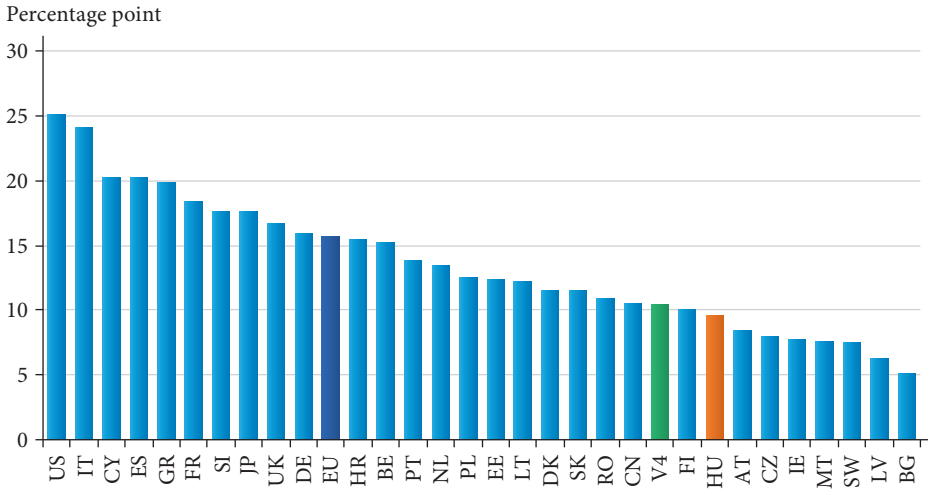
According to the September forecast of the MNB, gross government debt as a share of GDP will rise temporarily to 76% in 2020 due to the unfavorable economic environment caused by the coronavirus pandemic, as well as measures needed to mitigate the pandemic. The 10.6 percentage point increase in the rate is considered to be low in international comparison, and the public debt-to-GDP ratio in the Member States of the European Union may increase by an average of 16% in 2020 compared to the previous year.

As a result of the issuance of foreign currency bonds, by the end of 2020, we forecast that the foreign exchange ratio of central government debt may rise to around 18% (however, the share of foreign currency debt may be slightly higher at 21% of total government debt). Subsequently, over the forecast horizon of the September Inflation Report the ratio will decline.

Box 1: Government debt in international comparison

Gross government debt as a share of GDP may increase by an average of 16 percentage points in 2020 for the European Union and by 10 percentage points in the V4 countries compared to the previous year (Figure 5). Among the countries examined, the most significant increase may take place in the USA (25 percentage points) and Italy (24 percentage points), but in Greece and Italy an increase of 20 percentage points is expected in 2020, according to the European Commission's forecast. The public debt-to-GDP ratio in the Member States of the European Union may thus increase to 95% in 2020. In contrast to the deficit, the level of the debt ratio may increase more permanently and moderate only to a limited extent over the forecast horizon. The debt-increasing effect of the temporary high deficit is not expected to be reversed by budget surplus in the coming years, so a permanently higher debt level is expected. The debt ratio of Hungary was 4 percentage points higher than the average EU debt ratio in 2009, while in 2020 it could be about 19 percentage points lower due to the continuous decline between 2012 and 2019.

Figure 5
Government debt change between 2019 and 2020, as share of GDP (%)



Source: European Commission, International Monetary Fund, MNB Inflation Report (September).

Compliance with fiscal rules in 2020

In 2020, a total of eight fiscal rules have to be applied to Hungarian public finances, of which four Hungarian and four European Union criteria have to be complied with. There is an overlap between the rules in two places: the Maastricht 3% deficit criterion and the medium-term budgetary objective. The other two Hungarian rules are

the debt rules of the Fundamental Law and the debt formula of the Stability Act. The regulations that arise only in the fiscal framework of the European Union are the expenditure benchmark and the Maastricht debt rule.

Domestic budgetary developments will be in line with regulations this year due to the activation of escape clauses. The expected deficit of 7.0–7.5% for 2020 exceeds the 3% of GDP deficit criterion in both the Hungarian and EU budget frameworks, but these rules are temporarily suspended by the pandemic situation and the economic downturn. The increase in public debt is also made possible by the escape clause, according to which it is possible to deviate from the provisions of the debt rule of the Fundamental Law during an enduring and significant downturn in the national economy or during a special legal order. The structural budget balance falls short of the medium-term budgetary objective (MTO) and growth of expenditures is not expected to follow the corrective path outlined in the expenditure benchmark, but the monitoring with the compliance of these rules has been temporarily suspended by the EU institutions on the grounds of exceptional economic circumstances.

Regarding *the debt rule of the Fundamental Law,* the domestic government debt ratio is above 50% of GDP, so a reduction in the debt ratio is required under the rule.[4] Compliance with the debt rule is a condition for the adoption of the budget, which is assessed by the Fiscal Council. This year's budget law was passed by the Parliament in 2019 to include the expected reduction in the government debt ratio in line with the outlook at the time, thus compliance with the rule was ensured ex ante. However, on the basis of the escape clauses, the provisions of the rule may be deviated from during the year if an enduring and significant decline of the national economy occurs or the introduction of a special legal order becomes necessary.[5] A decline in the real value of gross domestic product in one year is already to be interpreted as an enduring and significant economic downturn, while a state of emergency, a state of national crisis, state of preventive defence, state of terrorist threat, unexpected attack and state of danger are special legal orders.[6] The economic downturn following the coronavirus pandemic will therefore override the debt rule and put in place an escape clause that will allow for a temporary increase in the debt ratio. Overall, the expected increase in Hungarian public debt this year is made possible by the flexibility of the rules.

Another domestic fiscal rule for government debt is the *debt formula* of the Stability Act. Based on the amendment to the Stability Act that came into force this year, the regulation stipulates that the debt-to-GDP ratio must decrease by at least 0.1 percentage point per year (instead of the previous numerical debt reduction formula) while conforming to the debt rule legislations of the European Union[7]. This year, the debt-to-GDP ratio will increase substantially, which would not be in line with the requirements of the debt formula, but this is not necessary either,

[4] Fundamental Law of Hungary, Article 36 (4)-(5), Article 37 (2)-(3).
[5] Fundamental Law of Hungary, Article 36 (6), Article 37 (3).
[6] Fundamental Law of Hungary, Articles 48-54.
[7] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 4 (2a).

because the escape clause will come into force as an effect of the decline in the real value of gross domestic product.[8]

The *Maastricht deficit criterion* in both the domestic and EU budgetary frameworks stipulates that the general government deficit should not exceed 3% of GDP.[9] In 2020, the general government deficit is projected to be 7.0–7.5% of GDP, which is higher than the threshold set in the regulation, but the Maastricht deficit target is subject to an escape clause in both the EU and domestic budgetary frameworks. The general escape clause introduced in the EU allows for a temporary deviation from the budgetary balance reference value and from the medium-term budgetary objective and the adjustment path towards it, provided that this does not jeopardize the medium-term sustainability of public finances.[10] Under the clause, EU institutions under the corrective arm of the Stability and Growth Pact do not initiate the excessive deficit procedure in the event of an excessive deficit, as their activities are merely limited to formulating revised country-specific economic policy recommendations. In the Hungarian legal framework, compliance with the 3% deficit rule is exempted on the basis of the decrease in the real value of gross domestic product.[11]

According to the set of rules for the *medium-term budgetary objective* found in both the domestic and EU legal systems, the general government balance must be determined in such a way that it is in line with the achievement of the medium-term budgetary objective.[12] The structural balance is used to measure this target, which is the cyclically-adjusted balance net of one-off and other temporary items. For Hungary, the medium-term budgetary objective has changed from –1.5% in 2020 to –1.0% of GDP. According to the forecast of the European Commission, a structural balance of –2.6% of GDP may be reached this year, which is not in line with the MTO. Following the entry into force of the general escape clause in the European Union, the Commission will not sanction or examine compliance with the rules of the preventive arm of the Stability and Growth Pact. Thus, Member States, including Hungary under the significant deviation procedure (SDP), will be temporarily exempted from the medium-term budgetary objective or, in the event of non-compliance, from the *expenditure benchmark* designating the correction path.

The *European Union's debt rule* states that a Member State's public debt ratios must not exceed 60% of GDP, however, if it does, then it has to be reduced at a satisfactory pace. The corresponding reduction in debt is quantified by the 'one-twentieth' debt rule; i.e. it is necessary to reduce the debt ratio by approximately one twentieth of the debt ratio above 60% on a three-year average. Based on its own forecast, the European Commission calculates the extent of the change in the debt ratio using three methodologies (forward-looking, backward-looking, cyclically-adjusted), and if at least in according to one of these methodologies the required one-twentieth reduction is achieved, the rule is considered

[8] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 7 (1)-(2).

[9] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 3/A (2) b).

[10] Council Regulation (EC) No 1466/97, Article 5 (1), Article 6 (3), Article 9 (1), Article 10 (3); Council Regulation (EC) No 1467/97, Article 3 (5), Article 5 (2).

[11] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 7 (1)-(2).

[12] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article A (2a).

to have been complied with.This year's debt ratio is expected to increase according to both the MNB and the European Commission, but is expected to decline again from 2021 onwards. The European Union's one-twentieth debt rule is expected to be met if the debt ratio declines in 2021 and 2022, respectively, after a temporary increase this year.

Appendix: Escape clauses of the different fiscal rules

In recent decades, the importance of fiscal frameworks has increased at both national and international levels. Measures and initiatives related to the development of fiscal frameworks include independent fiscal institutions and fiscal rules overseeing sound public finance management. Fiscal rules are a set of rules that define some, mostly quantifiable, constraint on fiscal policy, thus ensuring the prudent, sustainable and transparent functioning of fiscal policy. Fiscal rules usually refer to some aggregate indicator that captures public finance processes, and usually include an accountable requirement in this regard. The proper functioning of budgetary rules is expected to meet several assessment criteria. One such important aspect is that the rules should be sufficiently flexible, especially regarding the macroeconomic situation, which can be, among other things, guaranteed by the so-called escape clauses.

Escape clauses provide for the possibility of a typically temporary deviation from the fiscal rules. Fiscal rules often include such clauses, which ideally link a deviation from the rules to a well-defined numerical condition or legal situation. Given that one of the essential functions of fiscal policy is economic stabilization, it is important that fiscal rules do not impose pro-cyclical economic policies. The role of clauses is being especially appreciated in exceptional circumstances, such as at present, when the coronavirus pandemic posed an unprecedented challenge to economic agents, among other, to economic policy makers. In the event of a crisis, the flexibility built into the rules ensures that fiscal adjustment is not an automatic expectation, as experience has shown that this would exacerbate the economic downturn. Escape clauses allow for a temporary increase in the general government deficit, and thus in debt, which allows for counter-cyclical fiscal policies, partly through the operation of automatic stabilizers (e.g. declining tax revenues, increased job-seeking subsidies) and partly through crisis management measures.

In Hungarian law, the provision with the highest level of legal authority is the debt rule of the Fundamental Law, which is subject to two escape clauses addressed above. According to the regulation, the domestic government debt ratio may not exceed half of the gross domestic product, or until it does, the Parliament may only adopt a budget law that ensures a reduction in government debt as a proportion of GDP, and such a debt cannot be issued that would result in an annual increase in the debt ratio.[13] Under the escape clauses, deviation from the rule is only possible in the event of an enduring and significant economic downturn or during a special legal order.[14]

[13] Fundamental Law of Hungary, Article 36 (4)-(5), Article 37 (2)-(3).
[14] Fundamental Law of Hungary, Article 36 (6), Article 37 (3).

There are three other important regulations concerning domestic public finance processes in the Stability Act, two of which are automatically suspended in the event of an economic downturn. According to the recently changed debt formula, it is necessary to set the public debt ratio in the Budget Act in such a way that it decreases by at least 0.1 percentage point in the current year, while complying with the EU rules on debt reduction.[15] In addition, the Stability Act stipulates that the general government balance must be determined in such a way that the budget deficit does not exceed 3% of gross domestic product and is in line with the achievement of the medium-term budgetary objective.[16] The escape clause in the law applies to the debt ratio as well as the deficit target, and its application is possible in times of an enduring and significant economic downturn. It is important to emphasize that the Stability Act applies a lasting and significant economic downturn when the real value of the annual gross domestic product decreases, i.e. a one-year economic downturn activates the clause.[17]

The escape clauses of the European fiscal framework come into force in the event of an exceptional event that has a significant impact on the budgetary situation of the Member States (Table 3). The application of the clauses is not automatic but is decided on a case-by-case basis by the EU institutional system. Two types of clauses can be distinguished: the unusual events clause and the general escape clause. While the former is often used by the EU at Member State level in certain crisis situations, and especially in local disasters, there has been no example of the use of the general clause so far. The general escape clause has been incorporated into the EU fiscal framework through the Six-Pack legislation as a lesson learned from the global economic recession.

In response to the economic crisis that coincided with the spread of the coronavirus pandemic, the EU institutions introduced the general escape clause. On a proposal from the European Commission, based on the opinion of the Economic and Financial Affairs Council (ECOFIN), the conditions for the application of the clause that there will be a severe economic downturn in the euro area or in the Union as a whole are met. According to the European Commission's spring 2020 forecast, the eurozone economy could shrink by 7.7% this year, while the European Union's economy could shrink by 7.4%. The general escape clause is not intended to suspend the rules altogether, but mainly to allow for a temporary deviation from the budgetary balance reference value and the medium-term budgetary objective and the adjustment path leading to it, provided that this does not endanger the medium-term sustainability of public finances.[18] Thus, the governments of the Member States are assured that the additional budget expenditures related to the coronavirus, as well as the resources spent on economic protection, do not contradict the requirements of the European Union fiscal framework.

[15] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 4 (2a).

[16] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 3/A (2) a)-b).

[17] Act CXCIV. of 2011 on the Economic Stability of Hungary, Article 7 (1)-(2).

[18] Council Regulation (EC) No 1466/97, Article 5 (1), Article 6 (3), Article 9 (1), Article 10 (3); Council Regulation (EC) No 1467/97, Article 3 (5), Article 5 (2).

Table 3
The most important fiscal rules and their exemption clauses for the Hungarian budget

Hungarian rules	Description	Exemption clause
Debt rule	As long as government debt ratio exceeds 50% of GDP, only a budget that includes a rate reduction can be adopted.	Special legal order and the decrease in gross domestic product.
Debt formula	The debt ratio should decline by at least 0.1% of GDP per year.	Decrease in gross domestic product.
Deficit criterion	The general government deficit should not exceed 3% of GDP.	Decrease in gross domestic product.
Medium-term budgetary objective	The general government balance should be in line with the medium-term budgetary objective.	–

European Union rules		Description	Exemption clause
Corrective arm	Maastricht deficit	The planned or actual budget deficit should not exceed 3% of GDP.	An unforeseen adverse economic event with a significant negative impact on public finances or a severe economic downturn affecting the euro area or the Union as a whole.
	Maastricht debt	Government debt should not exceed 60% of GDP or should be declining at a satisfactory pace to the reference value.	–
Preventive arm	Medium-term budgetary objective	The budgetary position should be in line with the achievement of the medium-term budgetary objective.	An unusual event that has a significant impact on the financial position of general government and is beyond the control of the member state concerned, or a severe economic downturn affecting the euro area or the Union as a whole.
	Expenditure rule	The evolution of net primary budget expenditures should be in line with the adjustment path towards the MTO.	–

JUDIT ANTAL–CSABA KÖBER–GYÖRGY MOLNÁR–
KATALIN SZILÁGYI[1]

Impacts of the world economy on the EU, especially with regard to Brexit, including Hungarian economy and public finances

Summary

The defining global event of 2020 is the coronavirus pandemic. The global economic impact of the pandemic that originated from China, swept over the world and was followed by strict restrictions everywhere, will far exceed that of the 2008 financial crisis both in terms of global GDP loss and the number of countries affected. All the major international institutions emphasize the exceptional nature of this crisis, as the world has not witnessed such a global decline for almost a century. The IMF expects that 95% of the countries of the world will sink into recession this year, and performance is expected to decline significantly in all major economies except China. The OECD calculates that the global decline in output will be equivalent to as if all the economic activity of Germany and France (the two largest European economies) combined were completely zeroed out for a whole year.

In addition to its scale and severity, the pandemic is special in yet another dimension: it has unleashed on us an uncertainty of a previously unimaginable magnitude. We do not know exactly how many waves are ahead of us yet and how severe those will be. We do not know when vaccination will be available, and we do not know how it will be available to the world (overcoming manufacturing and logistical barriers). We do not know what processes could re-ignite the stricter restrictions, whether there will be new school, factory and store closures or drastic border closures. We do not know how long governments will be determined to have loose fiscal and monetary policies and how long financial markets will remain patient with rising debt ratios and low yields.

Like all other forecasting institutions, we make assumptions. In connection with the uncertainties described above, we make the following assumptions in the baseline scenario of the forecast.

- New waves of the infection will remain under control. This is mostly because we have learned the lessons from the first wave of the virus (such as that vulnerable groups need increased protection, or that mandatory indoor-mask use significantly reduces the spread of the virus) and thus we are better prepared for the re-emergence

[1] OGResearch, Budapest, September 2020.

of infections. We also have reason to believe that the movement of people (largely on a voluntary basis, even without strict restrictions) will remain much more restrained.
- Governments will not resort to drastic closures. The economic downturn of the first half of the year has made decision-makers around the world determined not to bring back severe restrictions. Health systems today are much better prepared to deal with the pandemic, so slowing down the spread at all costs is no longer the only policy goal.
- In line with major international organizations, we also believe that we do not have to live with the coronavirus forever as the vaccine is within reach, so the pandemic will be permanently eliminated over the next year. In line with this, the long-term state and growth potential of the world will not be fundamentally different from what we were used to before the health crisis.
- Governments around the world are determined to facilitate short-term adjustment to the epidemic; fiscal and monetary policies remain loose around the world and efforts are continuously being made to mitigate the cyclical downturn. We assume that loose conditions will remain with us in the medium term and that rising debt rates will not force a painful turnaround.

While the assumptions behind the baseline reflect a relatively high professional consensus (IMF, ECB, OECD or MNB think similarly about the most likely assumptions), virtually all forecasts emphasize the risks associated with the coronavirus. International and domestic economic policy institutions formulate alternative forecasting scenarios almost exclusively in relation to the course of the coronavirus pandemic, the availability of vaccines or the patience of financial markets. In this paper we do the same because we believe that the most important issues in the world economy today are related to the virus and the epidemic.

Three alternative trajectories

In the first scenario, we assume that the second wave of the pandemic will prove to be stronger than expected (there will be more infections and casualties), so it will force new restrictions and periodic closures. On this trajectory, we anticipate that another cyclical downturn will slow the world economy in 2021, which will also worsen the long-term growth prospects due to a temporary decline in production capacity. At the same time, we anticipate that the next wave will have only a milder effect on the functioning of the economy, because counteracting measures can already build on the experience of the first wave, best practices and a greater degree of adaptation by economic actors. This scenario is deteriorating economic prospects everywhere in the world, including, of course, Hungary. However, the effects are not dramatic, mainly because we imagine the second wave to be temporary, which will have a decisive impact only on the cyclical functioning of the economy.

In the second scenario, we outline a gloomier picture, and assume that a comprehensive vaccine that is a solution for all will not be available in the coming

years, meaning that the world will have to adapt to the virus in the long run. The slower-than-expected availability of the vaccine may be plausible as several large pharmaceutical manufacturers have reported testing difficulties, that licensing operates under very strict protocols in most countries and most countries do not have yet the necessary manufacturing and logistics capacities. This trajectory is more pessimistic than the previous one as it assumes a longer and largely supply-side adjustment (affecting long-term potential growth). Long-term output is damaged for three reasons. First, part of the workforce is permanently out of production, and during long spells of unemployment, their human capital (skills, motivation, routine) is also degraded. A related loss is that the number of hours actually worked is significantly reduced for some employees (typically parents of young children supervising online learning or caregivers of the elderly). On the other hand, companies are forced to make costly adaptations due to the virus (they need to ensure smooth telecommuting, digitize their operations, design, develop and consistently implement new operational practices). Overall, these will dampen the productivity of companies in the long run. Third, the persistent viral situation will trigger serious structural changes in the economy, bankruptcy rates will increase in certain sectors (tourism, hospitality), and many will be forced out of the market. Although it has the same effect, this scenario is much more pessimistic than the previous one and will significantly slow down the growth of the world economy and the Hungarian economy.

In the third scenario, we show that economic policy responses to the pandemic could induce tighter cooperation between EU countries that could be more beneficial to Europe's growth potential in the long run. The joint European rescue package adopted in July has already set an example of solidarity and enhanced coordination between EU countries. To address risks to fiscal sustainability, it is definitely worthwhile to move on from transitional assistance programs to deeper structural reforms. If these efforts are successful, the potential growth of the European Union may increase substantially, and this will have a positive effect on Hungary's growth and fiscal processes through the foreign trade and financing channels.

The Hungarian economy was in a decent shape, with a steadily high growth rate and a steadily declining public debt ratio when the coronavirus shock hit in. Thanks to our favorable initial conditions, the economy will return to a growth trajectory next year after the temporary downturn assumed in the baseline scenario, and the debt ratio will only rise temporarily, due to pandemic-related defense costs, revenue shortfalls and lower output level. In the baseline scenario, we expect economic growth to resume as early as 2021, although the GDP will not reach the pre-pandemic levels until 2022. In the baseline scenario, the government-debt-to-GDP ratio will also increase only temporarily in 2020, and will start to decline again after the epidemic.

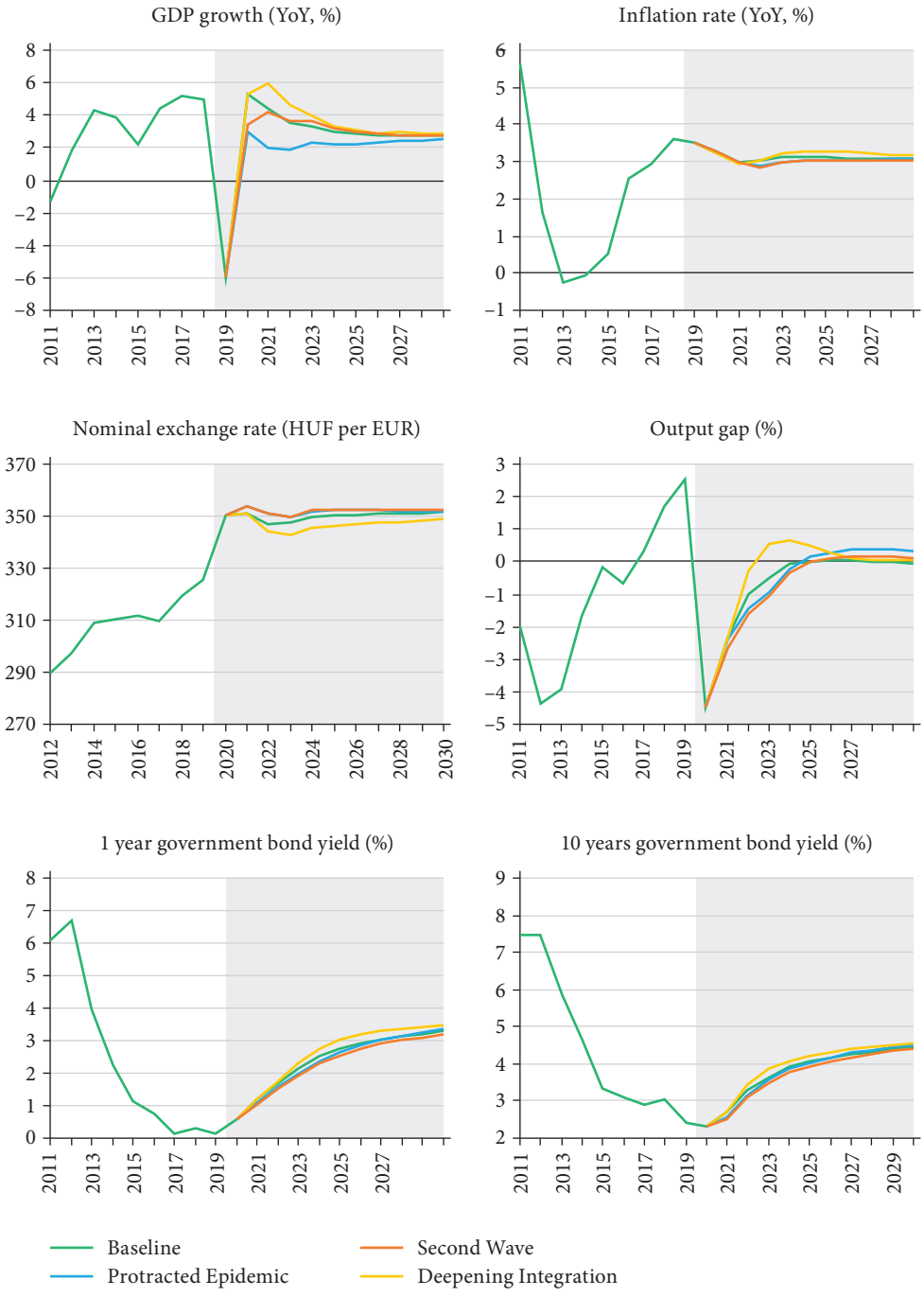
In our pessimistic scenarios, economic performance will decline more permanently and the debt ratio will rise for a longer time. The effect of the (milder) scenario, which assumes a second-wave closure, is similar to the baseline, so the shock brings about only temporary negative effects. In contrast, the no-vaccine scenario,

which assumes lasting adjustment pressures, would have much more drastic effects, with a sustained slowdown in growth and a medium-term increase in the debt ratio. The difference between the two paths points out that long-term fiscal sustainability depends much more on potential growth and fiscal adjustment pressures due to slowing potential growth than on the cyclical downturn in the economy. Or in other words: if the world economy manages to avoid permanent damage to the supply capacities, we do not have to worry about the growth and sustainability outlook of the Hungarian economy.

Our optimistic scenario also highlights the importance of sustained supply-side (structural) processes. The pandemic affected the countries of the European Union in very different ways. In countries where the service sectors (mainly tourism, hospitality), that require significant mobility of people and a lot of physical contact and account for a larger share of GDP, the decline is also much more dramatic. In a common economic area (especially with a common currency), these asymmetric shocks need to be addressed by economic policy. This recognition led EU leaders to adopt a record EUR 750 billion package in July, which allocates funds largely to southern member states hit hardest by the epidemic. However, the long-term growth potential of the countries that have now benefited must certainly be improved in order for the risk community to last. And this is only possible if EU reforms also target long-term, structural processes. These processes may even mean that, in the longer term, these developments, which will have a positive impact on the sustainable growth potential of our external environment, will be dominant. If the potential growth of the EU increases substantially, the long-term growth and fiscal sustainability prospects of the Hungarian economy will also improve.

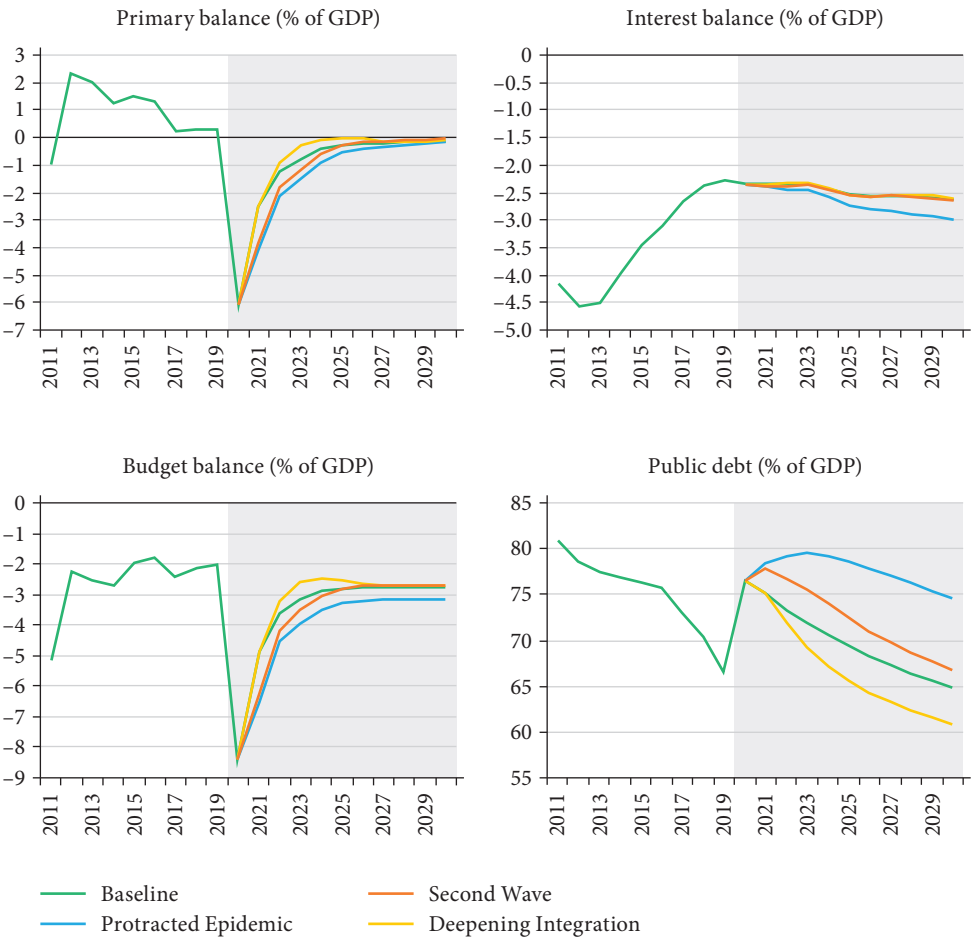
Baseline and alternative projections are illustrated in the following figures.

Figure 1
Macroeconomic indicators in the baseline and the alternative scenarios



Source: Hungarian Central Statistical Office (KSH), National Bank of Hungary (MNB), Government Debt Management Agency (ÁKK), OGResearch.

Figure 2
Fiscal indicators in the baseline and the alternative scenarios



Source: Hungarian Central Statistical Office (KSH), OGResearch.

DÁNIEL MOLNÁR (ED.)[1]

Macroeconomic and public finance situation for the first half of 2020 and macroeconomic forecast

Economic developments in the first half of 2020

As a result of the global coronavirus epidemic and the impact of government closures on the economy, the European Union economy contracted by 2.7% in the first quarter of 2020 compared to the same period of last year, while the recession aggravated to 13.9% in the second quarter. The U.S. economy expanded by another 0.3% year-on-year in the first quarter but shrank by 9.1% in the following quarter. In both economies, the significant decline in household consumption contributed the most to the percentage change in GDP.

The coronavirus epidemic has led to a significant drop in employment in the US and the European Union. As a result, the unemployment rate in both economies rose from 3.5% and 6.5% in December to 11.1 and 7.1% respectively, in June. However, the value of the indicator does not adequately reflect the share of the unemployed due to the inactivity of some of those who have lost their jobs.

Given the epidemic situation, the Fed and regional central banks reduced their key rates to close to 0% during the spring, while the ECB did not have the opportunity to do so, due to already low interest rates. In addition, the Fed, the ECB, and the regional central banks, as well as Poland and Romania, began buying secondary government securities to help the economy recover and resorted to fiscal easing.

Inflation in the US varied in the first half of 2020: in January and February inflation was followed by a deflationary period from March to May and market prices rose again in June and July, bringing the half-year average inflation to –0.1%. The biggest contributor to the monetary deterioration in July was the rise in energy prices, including fuel prices.

Inflation in the EU showed a declining trend in the first half of 2020: inflation of 1.7% in January fell to 0.8% by June, bringing the average for the last six months to 0.8%. The trajectory of inflation varied in the Visegrad countries: it fluctuated in Poland and the Czech Republic and slowed down steadily in Slovakia.

For the first half of this year as a whole, the world's leading currencies showed no significant shift against the dollar. The euro was essentially stagnant, the yuan

[1] Századvég Economic Research Institute. The report was prepared by Diána Horváth, Gergely Horváth, Tamás Isépy, Dániel Molnár, Anna Nikl, István Posgay and Gábor Regős.

weakened minimally, while the Swiss franc, pound and yen strengthened slightly against the dollar. Between the beginning and the end of the same period, the world's most important stock markets, accompanied by very strong fluctuations, all weakened, with DAX falling by 6%, DJI by 10%, FTSE by 19%, Shanghai Composite by 3%, STOXX by 22% and by Nikkei 225 by 4%.

According to the European Commission's spring forecast, the budget deficit as a share of GDP could rise from 0.6% of last year to 8.5% this year, due to epidemic-related spending and the economic downturn. As a result, government debt-to-GDP ratio could rise from 79.4% last year to 95.1%. At the same time, the Commission projected declining deficits and public debt for next year.

The performance of the Hungarian economy increased by 2.2% in the first quarter of 2020, but in the second quarter it was 13.6% lower than in the same period of the previous year, according to raw data. In the first half of the year, due to the coronavirus epidemic, the decline was 5.8% based on seasonally and calendar-adjusted data. Household consumption expenditure increased by a further 5.0% in the first quarter, but decreased by 8.4% in the second quarter compared to the same period of the previous year, which was also due to the negative economic effects of the coronavirus epidemic and restrictive measures. The volume of investments decreased by 1.3% in the first quarter and by 9.9% in the second quarter. The investment performance of enterprises increased by 3.9% in the first quarter of 2020, while it decreased by 12.1% in the second quarter of 2020.

The volume of exports fell by 0.5% in the first quarter and by 24.0% in the second quarter, while the volume of imports first increased by 1.3% and then decreased by 15.8%. The foreign trade balance thus moderated GDP growth by 1.6 percentage points in the first quarter and by 7.7 percentage points in the second quarter. On the production side, added value in services continued to grow moderately in the first quarter (2.4%), but fell sharply in the second quarter (–12.2%). The contribution to GDP was highest in services in the first quarter at 1.2 percentage points but declined the most in the second quarter (–6.8 percentage points).

Added value in construction rose by 3.0% in the first quarter, while it declined by 13.2% in the second quarter. The contribution of construction to GDP growth was 0.1 percentage points in the first quarter and –0.7 percentage points in the second quarter. Within the construction industry, the production volume of other constructions decreased by 7.2% and that of buildings by 7.4% in the first half of 2020. Industrial added value grew another 1.7% in the first quarter, while it fell by 20.1% year-over-year in the second. The production volume of most sub-sectors of industrial production decreased in the first half of the year, but increased in the manufacture of electrical equipment (7.7%), pharmaceuticals (5.2%) and food, beverages and tobacco (1.7%). The most significant declines were in the production volumes of mining and quarrying (–25.4%), coal and petroleum refining (–22.7%) and vehicle manufacturing (–26.2%).

On an annual basis, the number of employees decreased by 66,000 to 4,451,000 in the first half of the year due to the economic downturn following the coronavirus epidemic. However, after a low in April, employment gradually returned to growth.

By June, the unemployment rate had risen to 4.7%; however, given that some of those who lost their jobs became inactive due to the epidemic situation, the actual figure may have been higher than that. According to employee statistics, employment fell mainly in the private sector, while it stagnated in the public sector. The number of public employees did not change significantly during the first half of the year, i.e. so far the Start work programme has not been revamped in view of the crisis situation. Gross average earnings increased by almost 10% to close to HUF 400,000 during the first half of the year. Taking into account the effect of inflation above the 3% central bank target, this represents an annual real wage increase of 6.3%. At the same time, wage statistics are currently influenced by several factors (introduction of part-time employment, dismissals) due to which the increase in earnings does not accurately reflect the change in the income situation.

In the first half of 2020, the inflation rate averaged 3.4%, thus exceeding the 3% medium-term target set by the Hungarian National Bank (MNB), but remaining within the target. For 2019 as a whole, the rate of money deterioration was also 3.4%, but by the beginning of 2020 it had moved out of the 2–4% tolerance band, reaching 4.7% in January and 4.4% in February. Subsequently, inflation eased to 2.4% in April, due to the negative effects of the coronavirus epidemic on the international economic situation and significantly falling fuel prices. The fact that Saudi Arabia launched a price war against Russia in March, significantly boosting its production and reducing the Russian market share, causing the rupture of the oil price – in which the decline in global demand due to the coronaravirus epidemic also played a role – contributed significantly to the development of fuel prices.

In the past six months, the Monetary Council of the National Bank cut its key interest rate by 15 basis points to 0.75% at its interest rate decision meeting in June. Furthermore, in April the central bank did not adjust further the lower edge of interbank market forint transactions, but left it unchanged (at –0.05%), but raised its upper band edge by 95 basis points to 1.85%. In the interbank forint market (BUBOR – Budapest Interbank Offered Rate), banks can now trade in overnight money in the range of –0.05 to 1.85%. Doing business outside the interest rate corridor is not rational, as the central bank is available to enter into overnight deposit or credit transactions at the margins.

Due to the economic consequences of the coronavirus (temporarily lower employment and loss of income for companies), the Government decided to suspend the repayment of retail loans until the end of the year. The decision to resolve the liquidity shock affecting the population was made by the Government in agreement with the MNB and the Banking Association. At its March meeting, the Monetary Council took steps to strengthen the long-term liquidity and further lending potential of the banking system.

For the first time in the first half of 2020, at a pre-announced date, February 14, S&P changed Hungary's outlook on its sovereign debt rating from positive to stable, highlighting persistently high GDP growth, while Fitch did not change the rating. According to the S&P declaration, it could have upgraded Hungary within 24 months, but on April 29, at an unforeseen date, the institute again worsened the previously

positive outlook for Hungarian public debt. They argued that the unexpected move was necessary because of the negative economic effects of the Covid-19 pandemic. In its announcement, Moody's confirmed the current rating and stable outlook for Hungarian public debt. Thus, at Moody's, the risk rating of Hungarian government securities is at the lowest level of the category proposed for investment, while at S&P and Fitch it is one category higher.

The foreign exchange ratio of Hungarian government debt increased from 17.25% at the end of December 2019 to 18.97% by the end of June 2020. The increase is due to the fact that Government Debt Management Agency Pte. Ltd. (ÁKK) also issued foreign-currency denominated government bonds on the international market. However, this ratio remains in line with the 10–20% bandwidth requirement set out in the 2020 financing plan.

The forint depreciated by 7.9% against the euro in the last six months, which was mainly in the first phase of the Covid-19 epidemic. At the beginning of the crisis, there was a period when the exchange rate was 10% weaker than at the end of 2019. However, the weakening of the exchange rate moderated by the end of June as the first wave subsided. Regional exchange rates moved close together and the Czech koruna depreciated by 5.5% and the Polish zloty by 4.8% against the euro over the period under review.

The expected macroeconomic trajectory

The effects of the coronavirus were also felt significantly in the Hungarian economy in the first half of the year. After expanding 2.2% in the first quarter, its performance fell by 13.6% in the second quarter. With the lifting of restrictions, the economy has begun to restart, but a return to the pre-crisis trajectory is still a long way off. Restrictive measures are still severely affecting several sectors: international tourism and the entertainment industry have become impossible to operate. In connection with the second wave, the question is what measures should be taken and how long the virus situation will last. Therefore, it follows that, as a result of the pandemic, the forecast is subject to greater uncertainty than usual. According to our forecast, the performance of the Hungarian economy in 2020 may be 5.2% lower than a year earlier, followed by a 4.5% growth in 2021. This also means that the performance of the economy can only reach the level of 2019 in 2022, which is explained by the persistent decline in demand for tourism and cars.

Household consumption has grown dynamically in recent years as a result of their improving income situation. This growth, partly because of panic purchases, persisted even in the first quarter, but the second quarter already showed a significant decline due to restrictive measures. However, from June, the level of retail turnover has already reached the level of a year earlier, so we expect consumption to grow by 0.5% year-on-year. This is compounded by the fact that we expect households to make up for some of the consumption that fell out due to the curfew restrictions. In 2021, the volume of household consumption spending may return to its growing trajectory and exceed 4.1% this year.

The situation caused by the virus also affected investments. Businesses, the state and municipalities are holding back their investments due to uncertain prospects and declining revenues, and this can only be partially offset by the preferential loan programmes that have entered the market. The high base period data and the cyclicality of EU funds should also be taken into account when estimating investments. Accordingly, the volume of investments may decrease by 4.9% this year and increase by 3.1% next year.

Due to the deterioration of external demand and restrictions, the volume of exports may decrease significantly this year by 8.6%, which may be followed by a substantial increase of 7.2% next year. Within exports, a particularly significant decline is expected in transport services, tourism and vehicle exports. According to our expectations demand in these areas will not return to its 2019 level next year. The decline in imports this year will be much lower than that of exports (3.3%), given the purchase of medical equipment and stagnant consumption. The volume of imports could increase by 5.4% next year. The current account deficit could be 4.1% of GDP this year and 3.2% in 2021.

The most important risk associated with the prognosis is the coronavirus: What restrictions need to be imposed yet? How long do these last? What impact will they have on households and companies? In addition, the development of Brexit, the outcome of the US presidential election and the fate of US-China relations merit much attention.

According to our forecast, the number of employees may start to increase gradually after the low point in the second quarter; however, it may reach the pre-crisis level only in the second half of 2021, if no further large-scale closures are needed and external demand gradually recovers. Thus, the number of employees this year may average 4 million 453 thousand, while next year it may again exceed 4.5 million. The unemployment rate is expected to rise to 4.2% this year and then fall to 3.7% next year. At the same time, public employment can only play a limited role in this, as we do not expect a substantial increase in Start work programmes. According to our forecast, average gross earnings may increase by 9.8% this year and by 5.7% next year, which means real wage growth of 5.8 and 1.5%, respectively. However, the development of earnings due to the crisis processes does not adequately reflect the changes in the income situation; it is overestimated this year while it will be underestimated next year, following the recovery.

Inflation recently has topped the central bank's target band: in August, the rate of money deterioration was 3.9%, while core inflation was 4.7%. The underlying inflation processes are therefore strong, with individual effects moderating it. We estimate that inflation could be 3.7% in 2020 and 4.1% in 2021, provided there is no further significant weakening of the forint exchange rate. Inflation is being pushed up by the weak forint exchange rate, rising food prices and rising inflation expectations. In 2021, however, getting this year's rupture in oil prices to the base will pull inflation upwards.

The central bank is expected to continue to pursue a loose monetary policy. Based on our forecast, the base interest rate of 0.6% will be maintained over the entire

forecast horizon, the central bank will respond to rising inflation only with verbal intervention, and will not implement any substantial tightening in order to stimulate economic growth. If the economy does not restart at the right pace, it may respond with unconventional means (such as loan programmes).

At the end of the eighth month of 2020, the central sub-system of general government closed with a deficit of HUF 2,261.3 billion. Taking into account the economic shock caused by the coronavirus epidemic and the measures taken in connection with it, we also expect the under-execution of the payments of economic organizations, consumption-related taxes and of the population. The expenditure side is still determined by the control of the epidemic, as a result of which a significant over-execution can be predicted. Overall, we expect a deficit of 7.3% for this year, which is significantly higher than the 1.0% of GDP deficit in the Budget Act and the 3.8% announced in the Convergence Programme. Gross government debt could thus rise from 66.3% of the GDP to 75.6% this year.

Based on our forecast, growth is expected to pick up next year, however, to a level below the 2021 act, but it is important to emphasize once again that the forecast is subject to significant uncertainty. As a result of the discrepancy between the two forecasts, the announced tax measures and the spill-over effect of the economic shock caused by the coronavirus pandemic, we expect lower performance than expected for next year, but we expect to outperform consumption-related taxes and retail payments. On the expenditure side, the Government created a HUF 475.0 billion reserve to mitigate the negative effects of unexpected economic and social developments. In connection with the use of these, we forecast savings of HUF 118.8 billion. According to our estimates, the increase in the amount of the childcare fee will mean an additional expenditure of HUF 28.5 billion, while the subsidies and benefits provided on a social basis may be HUF 15.4 billion higher. The protection against the coronavirus will continue next year, which will require an additional expenditure of HUF 314.4 billion. In case of the Start work programme, we expect some of the beneficiaries to move to the competitive labour market, so we expect a saving of HUF 9.4 billion compared to the appropriation. In connection with pension expenditures, taking into account the divergence of forecasts, we expect additional expenditures of HUF 41.7 billion. This is offset by the fact that we do not expect a pension premium to be paid next year, as its legal condition, the achievement of the balance target of the current year's budget, is not met, so the HUF 53.4 billion provision will become a free source. According to our forecast, based on currently available information, the general government deficit will reach 3.5% of GDP in 2021, which is 0.6 percentage points worse than government expectations. Based on our projection, the size of public debt calculated according to the Maastricht criteria will amount to 73.3% of GDP by the end of next year.

GÁBOR REGŐS (ED.)[1]

Macroeconomic analysis and forecast for 2020–21

Economic situation at the time of preparing the forecast

In the EU as a whole and in the euro area, GDP growth slowed by 0.3 percentage points in the last quarter of 2019 compared to the third quarter: economic performance in the European Union grew by 1.2% and in the euro area by 1.0% on an annual basis. The expansion of the Union's large economies did not reach the EU average, only the United Kingdom was able to exceed the euro area by 0.1 percentage point, while France, Germany and Italy lagged behind. The US economy grew at an annual rate of 2.3% in the fourth quarter of 2019, so the rate of expansion also exceeded that of the euro zone and the European Union.

Employment growth accelerated in the US, while wage growth slowed during the winter months. There has also been a slight increase in employment growth in the European Union, mainly through the expansion of the ICT sector and construction. At the same time, the unemployment rate could not fall further significantly in any economy: it fell from 3.8% in the US in the previous year to 3.5%, while in the EU it fell from 6.6% to 6.2%.

To address the economic situation caused by the coronavirus, the world's leading central banks have announced significant monetary policy easing. Although the European Central Bank has not reduced its key rate, it has increased the size of its asset purchase programme and announced that it would provide preferential funding to banks to address potential liquidity problems. The Fed, on the other hand, cut its base rate twice by a total of 150 basis points in extraordinary meetings. In addition, the central bank announced the resumption of its asset purchase programme and the execution of repo operations. The Bank of England, the Czech National Bank and the National Bank of Poland also cut their base rates at an extraordinary meeting.

The world oil price, which fundamentally determines global inflation processes, fell from the January opening value of USD 61.18 to 20.48 at the end of the quarter, a decrease of 66.5%. The downward trend seems to be reversing from April, with the barrel price typically above USD 30 in the first half of the month.

[1] Századvég Economic Research Institute. The forecast was prepared in April 2020, taking into account the data available at that time, by Diána Horváth, Gergely Horváth, Tamás Isépy, Dániel Molnár, Anna Nikl, István Posgay and Gábor Regős.

In the US annual inflation was 2.5% in January 2020, 2.3% in February, and 1.5% in March. Both in the EU as a whole and in the euro area, annual inflation declined in the first quarter. In the case of the EU, inflation of 1.7% in January fell by 0.1 percentage points in February and then by a further 0.4 percentage points in March, reaching 1.2%. In the Visegrád countries inflation followed a fundamentally declining trend during the first quarter, with only Poland showing an increase in January-February.

Among the world's leading currencies, the euro, yuan, Swiss franc, yen and pound sterling also strengthened against the dollar earlier this year. The world's major stock markets, with the exception of China, closed in minus early December to late February. The DAX was 8.3%, the DJI 8.5, the FTSE 9.7, the STOXX 6.3, and the Nikkei 10% below the opening value, while the Shanghai Composite price was 0.2% above it.

According to the latest forecast by the European Central Bank for March, fiscal discipline in the Eurozone could ease. The budget deficit as a share of GDP is projected to rise from 0.7% in 2019 to 1.5% by 2022. As a result, the value of government debt can only decline at a slow pace: from 84.5% of GDP to 82.6% between 2019 and 2022. However, the forecast was made before the spread of the coronavirus in Europe. As a result of the governments' responses to it and the economic slowdown, the budget deficit and thus public debt may increase to a greater extent in the coming period.

According to raw data in the fourth quarter of 2019 the Hungarian economy grew by 4.5% and, based on adjusted data, by 4.6% compared to its level a year earlier. On the production side, most sectors contributed positively to GDP growth, most notably services, by 2.6 percentage points. The added value of services increased by 4.6% in one year, within which trade, car repair, accommodation and food service activities (10.7%), information and communication (6.9%) and transport and storage (6.1%) sectors fared better than average. The added value of agriculture increased by 1.0% in one year, but due to its low weight it did not make a significant contribution to GDP growth. Growth in industry was 3.2%, including manufacturing 3.0%, and the added value in construction grew 11.3% year-on-year during the quarter. Industry contributed 0.7 to 0.6 percentage points of GDP growth, while both manufacturing and construction contributed 0.6 percentage points. Expansion is due to EU funds and public and entrepreneurial investment.

On the consumption side, household consumption grew by 4.8% and consumption expenditure by 5.4% in the fourth quarter, helping the growth of gross domestic product by 2.8 and 2.5 percentage points, respectively. The expansion of consumption was made possible by the dynamic rise in family incomes, which significantly exceeded inflation. Gross fixed capital formation continued to grow significantly: it was 7.0% higher than a year earlier, contributing 1.9 percentage points to GDP growth. In the fourth quarter of 2019, the volume of exports grew by 2.7% and that of imports by 4.6%, so the foreign trade balance slowed down the growth of the economy by 1.9 percentage points overall. The contribution of foreign trade in services to expansion was 0.5 percentage points, while goods decreased by 2.5 percentage points during the quarter. In the fourth quarter, the foreign trade balance showed an asset of HUF 208 billion, which is HUF 186 billion lower than in the same period of the previous year. The aggregate household confidence index remained negative in the fourth quarter on the basis of seasonally adjusted values

(–4.4 index points). The indicator deteriorated from the previous quarter, while it improved compared to the fourth quarter of 2018.

In the fourth quarter, the seasonally adjusted number of employees increased again: an average of 4,517,000 people worked in the Hungarian economy due to the expansion by 19,000 people. The number of employees also increased further as a result of the growth of the private sector, while the number of employees in the public sector decreased again, and the number of public workers stagnated below 100,000 in the last quarter. The number of unemployed decreased by 5,000 in the fourth quarter: on average, only 158,000 of the active population had no jobs during the period, which is 3.4%. Within this, the share of the long-term unemployed (those out of job for at least a year) has dropped to another low, below 30%. The increase in the number of reported unsupported new jobs and the decrease in the number of jobseekers increased, while, according to the vacancy statistics, the labour shortage in the Hungarian economy eased in the last quarter. In the fourth quarter, net average earnings increased by 12.8% to over HUF 260,000 due to the increase in the minimum wage and the guaranteed minimum wage at the beginning of the year, the wage-raising effect of the labour shortage and wage settlements in the public sector.

Prices in the Hungarian economy continued to rise in the first quarter of 2020: domestic inflation was 4.7% in January, 4.4% in February and 3.9% in March. The weakening of the forint, years of dynamic wage increases, and strong domestic demand also contributed to inflation, while weakening international oil prices and the weak international economy due to the coronavirus epidemic moderated price increases. The rise in prices was driven by rising tobacco prices as a result of excise duty increases, as well as rising food prices. In the latter product category, the increase in the price of pork should be highlighted, which can be attributed to the swine flu that decimated the pig population. Among the central bank's core inflation indicators the raw, seasonally adjusted core inflation indicator was 4.0% in January 2020, 4.2% in February and 4.3% in March, respectively and the core inflation adjusted for indirect taxes was 3.7, 3.8 and 3.9%, respectively.

During the winter, the Monetary Council of the Hungarian National Bank (MNB) left the key interest rate unchanged (at 0.9%) at its all three interest rate decision-making meetings (December, January and February), and the rate was not change in March either. The central bank currently uses two of its unconventional tools influencing short-term yields. These are the use of FX swaps (forint-liquidity providing foreign-exchange swaps) and the modification of the interest rate corridor. The MNB may have an effect on short-term yields by modifying the tenders and volumes of FX swaps with a maturity of 1 to 12 months, as well as by raising the lower level of the interest rate corridor and rebuilding its upper edge. At its March meeting, the central bank also lifted the required reserve and decided to introduce a fixed-rate secured loan facility.

General government gross consolidated debt at nominal value was HUF 30,287 billion at the end of the fourth quarter of 2019, which was 64.8% of GDP (after 68.4% a year earlier). The foreign-exchange ratio of government debt has declined slightly in the recent period, from 17.9% at the end of October 2019 to 16.2% at the end of January 2020. Thus, its foreign-exchange ratio was in the 10–20% range specified in the Government Debt Management Agency Pte. Ltd. (ÁKK) 2020 financing plan.

The expected economic trajectory

We elaborated our forecast on March 16, 2020, taking into account the data available until then. In addition to the baseline trajectory, two alternative trajectories were also prepared, taking into account the uncertainty caused by the virus situation. The baseline scenario assumes a relatively briefer epidemic, lasting only a few months, but the first alternative trajectory is also based on the fact that the economy is already operating along approximately normal trends in the third quarter. The second alternative trajectory is more pessimistic than this, expecting the recovery to begin only in the second half of the third quarter. However, along all three paths, we expect the government to take stimulus measures that will help maintain jobs, survive businesses and relaunch the economy as soon as possible.

In the fourth quarter of 2019, the Hungarian economy expanded at the expected pace: 4.5% on an annual basis, according to raw data, and 4.6%, according to adjusted data. Meanwhile, growth in the European Union was only 1.2%, according to both raw and adjusted data. However, this only means that Hungary is facing a situation caused by the coronavirus from a more favourable position than that of Italy, which has been stagnant so far but has been severely affected by the virus.

The emergence of the virus and the measures taken as a result, as well as their economic effects, have fundamentally redrawn previous economic forecasts. Given that the duration of the pandemic is unknown, the associated uncertainty is also huge, so the forecast is subject to significant risks. It is also the question, what the long-term effects of the pandemic will be, how it will rearrange supply chains, and how much it will drive back tourism.

At the same time, Hungary, as a small, open economy, is strongly influenced not only by domestic but also by international processes and thus by the development of external demand. It is therefore worth reviewing the main risk factors associated with external demand. Of these risks, of course, the prolongation of the coronavirus is now the most important, but a few more aspects are also worth mentioning:

- Oil price developments: oil prices have fallen significantly in the recent period. Persistently low oil prices adversely affect exporting countries and rapid price increases affect importing countries.
- Brexit: Although the British exit has officially taken place, we are only in a transitional period; there is no agreement yet on a long-term system of relations between the European Union and the United Kingdom.
- Reorganization of the economy: the coronavirus pandemic may lead to changes in the structure of the economy (e.g. relocation of production, shortening of supply chains, reduction of international tourism), which may affect different countries differently.

According to our baseline expectations, the effect of the virus will be strongest at the end of the first quarter and in the first half of the second quarter. However, many factors need to be taken into account when estimating the effects: in terms of consumption, for

example, the demand for food has increased significantly, while the demand for other products has decreased or their use has become impossible due to the restrictive measures. International tourism has ceased, car factories do not produce. However, some of the production lost in this way can be made up when production resumes. Taking all these factors into account, we expect an economic growth of –0.3% in 2020, 3.4% in 2021, and 4.5% in 2022. However, the downturn in 2020 is accompanied by significant downside risks in the event of a prolongation of the pandemic.

Consumption may increase slightly, by 0.4% this year, mainly due to a buying spree. Next year, the growth of consumption may be more moderate than usual in recent years, 3.0%, while in 2022 the economy may return to growth, so the growth of consumption may be 3.9%. The more subdued growth than before is explained by the unfavourable developments this year: slower wage growth and lower employment. The volume of investments may decrease by 1.2% this year, until next year it may increase by 4.9% and in 2022 by 4.2%. This year's slowdown may be due to the rescheduling of private investment, the possible reallocation of government resources, and production difficulties in the construction industry.

The volume of exports could fall by 1.4% this year due to the coronavirus, provided the backlog in production can be imported later in the year. The decline in imports will be more modest, at 0.1%, explained by a more moderate decline in domestic demand. With the relaunch of the economy in 2021, exports could expand by 4.4% and imports by 3.9%, while in 2022, growth could be 5.6% and 4.3%, respectively. So net exports will slow this year, but in the next two years it could already accelerate economic growth.

According to our forecast, the number of employees could decrease by more than 70,000 this year to 4,440,000 due to the economic situation caused by the coronavirus pandemic. At the same time, assuming a slow recovery starting in the second half of this year, the number of employees may increase again by 20,000 next year, while by 2022 it may approach 4.5 million again. As a negative effect of the downturn, activity may decline this year and the unemployment rate may rise to 4.3%, as well as the number of people employed in public employment may increase significantly, by almost 60,000. However, temporarily, the unemployment rate may be higher. On the other hand, from 2021 we expect that activity will increase again, by the end of 2021 the share of the unemployed will fall below 4% and the number of public employees will also start to decrease. We expect average wages to rise at a rate of just over 8% this year and the next, as a result of raising the minimum wage and guaranteed minimum wage, as well as public wage settlements, which could be followed by growth of over 9% in 2022. In real terms, this means an increase of over 4% this year and the next, while in 2022 it will increase by almost 6%. At the same time, our forecast for wages is subject to more risks than usual, in addition to which we must emphasize that the dismissal of low-wage earners may also increase the value of the average wage through the composition effect, which does not result in an increase in welfare. It is also important to stress that the expected increase in the number of part-time employees also distorts the statistics.

Inflation has been higher than expected in the recent period due to the weak forint exchange rate and strong demand and has been above the target range. We expect

the rate of money deterioration to continue to exceed the central bank target: 3.7% this year and 3.5% in 2021 and 2022. However, the related risks are significant and may change from minute to minute: the oil price decreased significantly, while the forint weakened further from the previous level. The first factor slows down and the second raises inflation. Increased demand for certain foods and the disruption of supply chains for certain products are also driving up consumer prices. Thus inflation may range quite wide this year.

The goal of monetary policy is currently twofold: to ensure financial stability and to drive inflation back to the 3% target. The former aspect requires the loosening of monetary policy, while the latter requires its tightening, so any action is conceivable from the central bank according to the given situation. However, once the economy has stabilized, monetary policy should aim to strengthen the forint, as the persistence of the current weak exchange rate could lead to a lasting stagnation of inflation over the longer term.

In terms of the budget, our institute expects a deficit of 3.0% by 2020, above the planned deficit of 1% of GDP and also exceeding the 2.7% level communicated in connection with the measures against the coronavirus epidemic. Although the deficit is expected to increase compared to the previous year, we will still meet the 3% Maastricht deficit criterion (otherwise suspended for this year). We also expect an increase in gross government debt as a share of GDP: it could rise to 68.1%. The gap between the estimates and the actual outturn is at risk from the measures taken in response to the coronavirus epidemic through the evolution of the budget deficit, the pace of economic recovery, the level of EU funding and the Government's demographic and competitiveness measures.

Based on our projection, in 2021 the general government ESA balance as a share of GDP may reach –2.0%, compared to –0.7% in the long-term forecast of the Ministry of Finance. The level of government debt calculated according to the Maastricht criteria will reach 65.6% of GDP, a decrease of 2.5 percentage points compared to the estimated 68.1% for 2020. Using the estimated deficit and government debt values in our medium-term macroeconomic model, the budget is expected to have an ESA deficit of 1.1% and government debt of 61.2% by 2022.

Compared to recent years, the role of risk scenarios has increased due to the coronavirus. The first alternative trajectory is considered equivalent to the baseline trajectory in terms of probability of occurrence. In the first alternative pathway, we examine a more prolonged virus situation compared to the baseline pathway, still assuming a V-shaped recovery pathway. At the second alternative trajectory, however, the viral situation persists for a significant part of the third quarter, with businesses suffering more, so the economic trajectory in this case is more similar to the U-shape.

So for the first alternative trajectory, this year's 4.8% decline will be followed by a 7.8% rebound next year, with the economy's performance in 2021 likely to exceed 2019. However, along the second alternative trajectory, the 9.9% decline in 2020 could be followed by only an 8.5% expansion next year, so the economy's performance in 2021 may lag behind 2019. In 2022, economic performance will increase by 4.7% along the first alternative trajectory and by 4.2% along the second alternative trajectory,

assuming the start of mobilization of resources related to the new EU budget cycle. Our estimate of inflation indicates similar inflation between 3 and 4% along all 3 macro trajectories, with significant uncertainties. Uncertainty along all three trajectories is caused by the duality that a significant fall in fuel prices pulls inflation downwards, while a large rise in food prices pulls it upwards.

As a result of more unfavourable macroeconomic developments, fiscal developments will also be less favourable along both alternative paths. Along each trajectory, we started from the baseline budget scenario and adapted it to the parameters of the changing macro trajectory. We therefore continue to assume that the government will take stimulus measures. Thus, along the first alternative trajectory, the general government deficit as a share of GDP could be 3.8% in 2020, 2.2% in 2021, and 1.1% in 2022. Accordingly, government debt as a share of GDP will first increase from 66.3% in 2019 to 72.6% and then decrease to 67.2% and 62.5%, respectively. Along the second alternative trajectory, the general government deficit could be 5.4% in 2020, 3.6% in 2021 and 2.4% in 2022, as a result of which the public debt will increase from 66.3% in 2019 to 69.7% by the end of 2022.

JUDIT ANTAL–CSABA KÖBER[1]

Macroeconomic and budgetary situation and outlook for 2020–22

Our analysis presents our short-term forecast for the macroeconomic developments, the budget deficit and public debt ratio for the period 2020–2022. The forecast and the analysis take into account the data and information available up to 15 April 2020.

The economy performed above expectations again in 2019

Hungary's economic performance has again been above the expectations of professional forecasters in 2019. Despite the gradual deterioration in the euro area, real GDP growth slowed only slightly compared to 2018, reaching 4.9% year on year. As in previous years, rapid economic growth has been accompanied by loose fiscal and monetary policies and significant EU transfer inflows. In line with the stimulative economic policies, the positive output gap has widened further. Unemployment fell to another historic low of 3.4% in the last quarter of 2019, and the headline inflation continued to rise gradually in parallel with rapid wage growth of above 10%.

Thanks to the favorable economic conditions and a spectacular improvement in tax collection, tax revenues exceeded the plans. The government used the tax revenue surplus, which was mainly generated by cyclical processes, to increase expenditures. Overall, the budget deficit amounted to 2% of GDP in 2019, which means a decrease of 0.1 percentage point compared to 2018, equaling the decrease in interest expenditures.

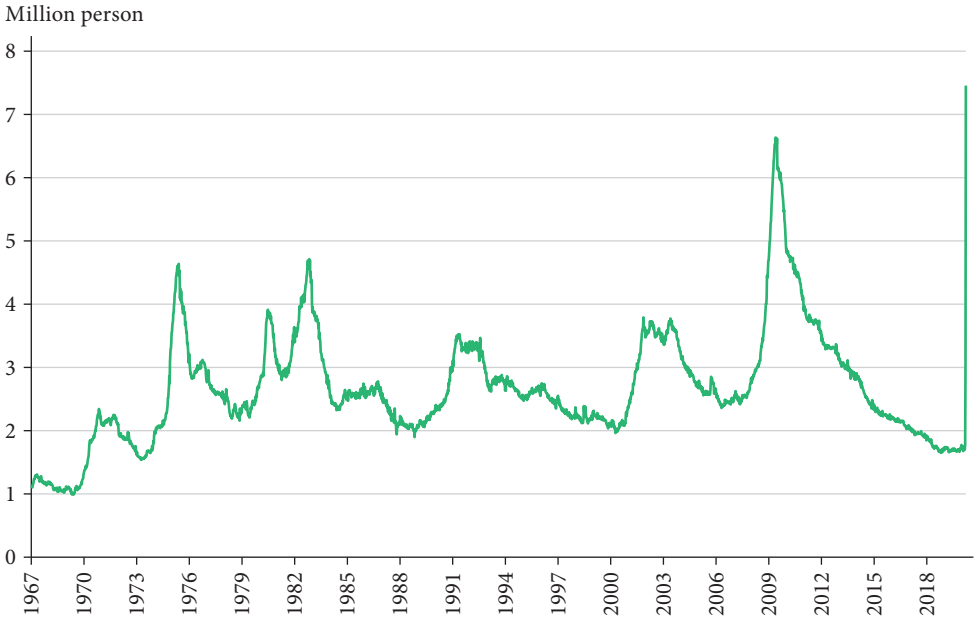
Despite years of fiscal easing, the accrual-based budget deficit remained well below the 3% ceiling set in the Maastricht criteria. At the same time, the so-called structural balance, i.e. the balance net of the positive effects of the economic cycle, showed a deficit of 3.3% in 2019. This means that in a neutral economic environment, i.e. at the end of the cycle, the ESA deficit would have exceeded the 3% ceiling.

[1] OGResearch, Budapest, April 2020.

Impact of the COVID-19 epidemic on the international environment

The coronavirus epidemic, which started in China at the end of 2019 and became global by March 2020, is causing serious social problems and redraws fundamentally the international economic and financial developments via its significant impact on both economic supply and demand. Although the epidemic became global only weeks ago, the available high-frequency data suggest a drastic downturn that surpasses the 2008 international financial crisis.

Figure 1
Unemployment rate in the United States (seasonally adjusted, weekly data)



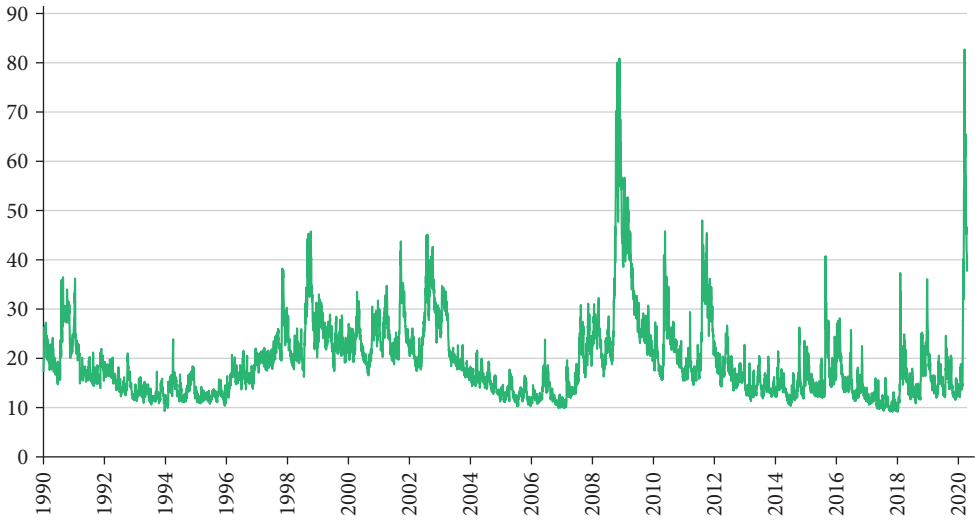
Source: Federal Reserve Bank of St. Louis.

The precautionary measures taken to contain the epidemic, as well as the decrease in labour supply due to the pandemic, have led to a significant drop in capacities and disruptions in production in certain economic sectors in many countries around the world. Restrictions on working time, the introduction of part-time work and layoffs began almost immediately in the sectors directly affected by the crisis (Figure 1). Falling incomes and rising unemployment, as well as negative expectations about them are containing consumption and investment demand. Thus, in addition to the supply driven decrease in production, the fall in demand triggers an increasing decline of the output. The revenue losses lead to liquidity problems for many companies, and in the sectors hit hardest by the crisis – in the absence of external support – a significant proportion of companies are at risk of bankruptcy already in the short term.

Increased uncertainty and deteriorating expectations will trigger an increase in risk indices and, at the same time, an increase in risk premiums expected from

investments (Figure 2.). At the same time, shrinking liquidity, deteriorating growth prospects, growing uncertainty and rising funding costs in real terms are dampening corporate investment demand. Overall, COVID-19 will significantly dampen both global growth and international trade. The depth of the crisis and the speed of the recovery are highly uncertain and depend to a large extent on the duration of the epidemic and the effectiveness of crisis management.

Figure 2
Volatility Index (point)



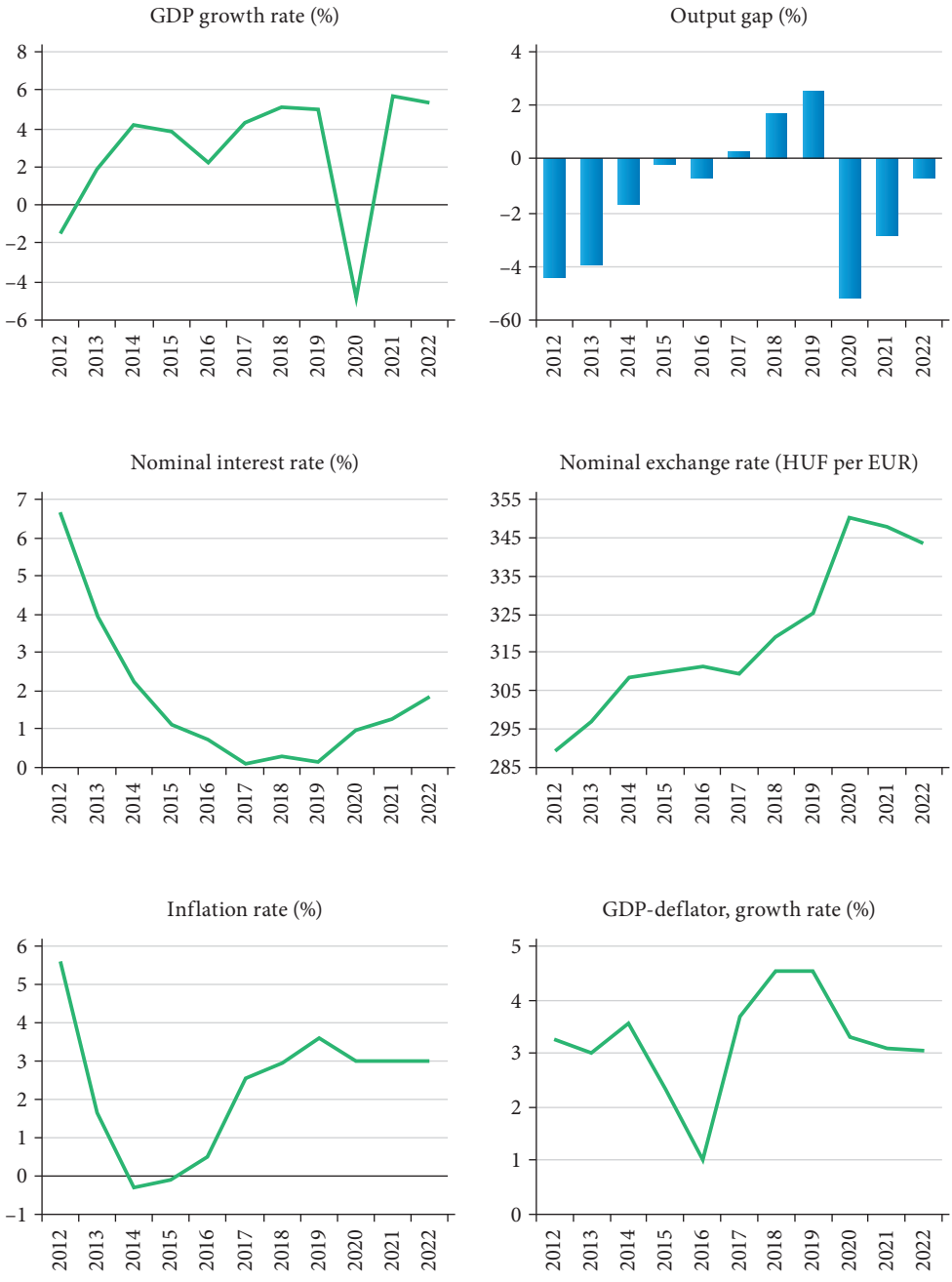
Source: Chicago Board Options Exchange Volatility Index, download from the Fred database of the St. Louis Federal Reserve Bank. (https://fred.stlouisfed.org/series/VIXCLS, April, 16 2020).
Note: The VIX index is a measure of short-term volatility priced in stock index options perceived by market participants.

According to our forecast, in 2020, COVID-19 will trigger a significant, 5.8% economic contraction in the euro area. The recovery is expected to be gradual, due to structural problems in some euro area countries and a lack of room for manœuvre for fiscal policy.

Domestic macroeconomic and budgetary forecast: temporary recession, increase in budget deficit and debt

As a result of the drastic deterioration in the external environment and the direct impact of the COVID-19 epidemic, the Hungarian economy will also be in recession in 2020. We assume that the measures introduced to contain the pandemic will last for two months. During the lockdown period, economic performance will be 26% lower compared to the "normal" situation, which, in addition to the decline in manufacturing output, will mainly be due to the decline in tourism-related sectors, trade and transportation.

Figure 3
The main macroeconomic variables of the forecast



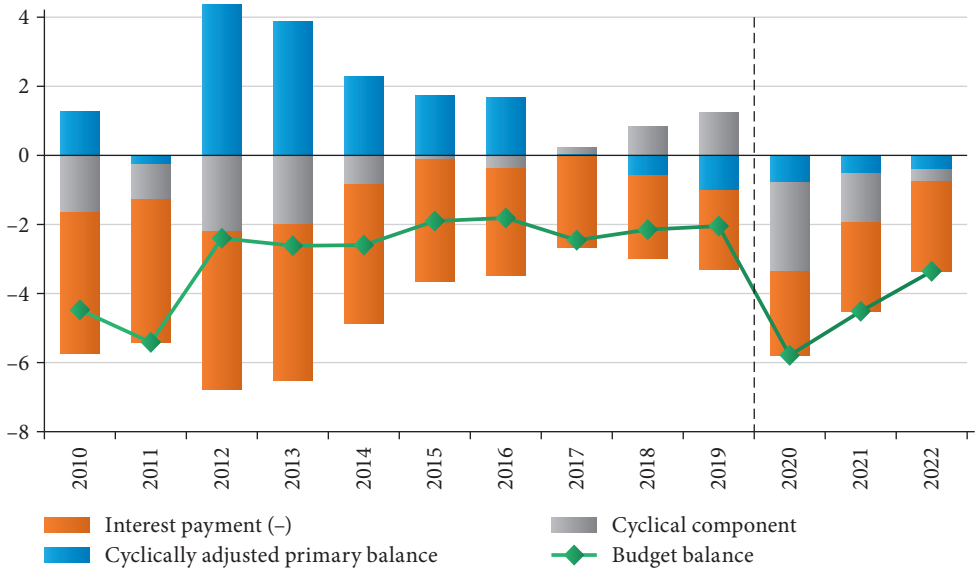
Source: Hungarian Central Statistical Office (KSH), National Bank of Hungary (MNB), Government Debt Management Agency (ÁKK), OGResearch.

Therefore, the rate of decline could be around 4.8%, while the output could be more than 5% below its potential level. The recovery will trigger a real GDP growth rate of above 5% in 2021–22, but output may remain slightly below its potential level even in 2022 (Figure 3).

In addition to the effects of COVID-19 and the external environment, the fact that fiscal policy will no longer stimulate demand in 2020 and that monetary policy will be forced to raise interest rates will also play a role in slowing down growth and the gradual recovery. The announced fiscal and central bank measures will primarily contribute to mitigating the effects of the crisis by easing liquidity constraints and expanding funding opportunities. Overall, fiscal measures announced until mid-April 2020 do not significantly stimulate the economy, as they are financed mainly through budgetary reallocations and tax increases. In addition, the EU transfer inflows are set to slow down.

Thanks to the extremely high level of planned reserves, the government can easily and efficiently reallocate budgetary resources. At the same time, as the reserves would have been used by the state in a "crisis-free" scenario – and, in our view, part of it would have covered tax revenue losses due to cyclical processes –, reallocations are not expected to change significantly the structural budget balance. Thus, there is no substantial economic stimulus on the budgetary side. In addition, the amount allocated to key areas for mitigating the economic downturn, i.e. measures directly reducing the risk of corporate bankruptcies and mass layoffs, is limited, the application mechanism is complicated and the set of criteria can significantly limit the number of eligible companies. Meanwhile, the inflow of EU transfers is also slowing down.

Figure 4
Budget deficit indicators along the baseline forecast (as percentage of GDP)



Source: Hungarian Central Statistical Office (KSH), OGResearch.

In 2020, despite the conservative fiscal policy, the ESA budget deficit could rise to 5.8% of GDP, mainly due to a decline in tax revenues driven by cyclical developments.

In 2021, the economy will be recovering; the negative output gap will decline, so the change in the cyclical component will reduce the budget deficit by about 1.2 percentage point. In addition, we assume that the government will continue to pursue a prudent fiscal policy, thus not introducing measures with a substantial deficit-increasing effect. The cyclically-adjusted primary balance may thus decline slightly further. However, with the gradual revaluation of debt, the implicit interest cost of government debt will increase, so that interest expenditure as a share of GDP may increase slightly. Overall, the above factors are likely to reduce the ESA budget deficit by 1.3 percentage points of GDP, so the balance could be around –4.5% of GDP.

In 2022, we expect a nearly neutral fiscal policy and assume that the impact of fiscal deficit-increasing measures will be offset by a reduction in expenditures as a share of GDP. We estimate that interest expenditure as a share of GDP will not increase further during this period. However, due to the closing of the negative output gap, the change in the cyclical component will further reduce the deficit by more than 1% of GDP.

As a result of the above processes, the ESA-based budget deficit is on a declining path after the significant increase projected for 2020, but may remain above 3% of GDP in 2022 (Figure 4). At the same time, the structural balance is expected to significantly exceed the target of 1% set for 2022 outlined by the fiscal surveillance mechanism of the European Commission.

The recession triggered by COVID-19 will halt the process of the decline of the public debt ratio. The debt-to-GDP ratio is projected to increase by 6.4% of GDP to 72.8% in 2020. Then, the indicator is expected to follow a declining path again and may reach 68% of GDP by 2022. Thus, according to our forecast, in 2022 the gross debt ratio may still exceed its 66.3% level recorded in 2019. The cumulative increase in the debt ratio is mainly due to cyclical factors, i.e. the GDP contraction and the deficit-increasing effect of declining tax revenues.

PÉTER ÁKOS BOD–ILONA CSERHÁTI–TIBOR TAKÁCS[1]

Macroeconomic and public finance situation: An outlook for 2020–22

Purpose and structure of the analysis

Our present analysis is an updated summary of our macroeconomic research covering the period 2020–2022 (hereinafter: the comprehensive analysis), conducted in April 2020, and based on data available then for the first quarter of 2020 and the measures taken up to that time. In this paper, however, we already take into account domestic and international data on the second quarter of the year, the evolution of the epidemic, and the economic policy and political decisions that have been taken place by mid-October 2020. Based on the new information, we present the probable macroeconomic trajectory (see appendix).

As the economic, societal and financial processes of the period examined are extremely influenced by a non-economic shock of the epidemic, we had to make assumptions in our model about the global and domestic development of the epidemic. The model calculations in the comprehensive analysis were based on the assumptions that the epidemic situation would be consolidated in the countries concerned by autumn 2020, after which the impact of the shock would be greatly reduced through health measures and social adaptation. We forecast the economic processes, social responses, and government measures with these assumptions in mind. Based on statistical data, business-cycle surveys, and corporate surveys available until mid-April 2020, we assumed at that time that the second quarter of 2020 year would be the trough in Hungary.

At the time of preparing this present forecast, third quarter GDP data are not yet available, but available economic indicators so far confirm the assumption that Hungary's output reached its bottom – similarly to countries in likewise situations – in the second quarter of 2020, and recovery, although fragile, can be predicted.

In the meantime, however, a second wave of the epidemic has hit many countries around the world, including our region. Compared to what was experienced in February-March 2020, this affects Central and Eastern Europe, and Hungary in particular, very strongly, as indicated by the growing numbers of the registered infected, hospitalized as well as the counts of deaths due to Covid-19. The worsening of the

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epidemic situation has direct economic consequences; business and public expectations are deteriorating. In view of all this, we here forecast a deeper decline of Hungarian GDP: a contraction of 1.3 percentage points larger than in the original study. The 4.5% economic growth projected here for the year 2021 should be interpreted in the context of a recalculated GDP contraction of 6.1 per cent in 2020. Thus, the return to pre-crisis output level will be postponed to 2022.

The economic trajectory indicated here takes into account the expected conditions of the international environment, changes in social conditions, the current and assumed effects of economic policy measures. Over the period under review we expect tensions in international trade to persist, with global interest rates projected to remain low. At the time of the comprehensive analysis in spring, the Hungarian government's first policy response was already known. As for the job-retention part of the 'economic protection package' is concerned, it has helped to curb unemployment growth, but the first measures were somewhat delayed, modest by international standards, and too many of the presumed participants were unable or unwilling to enter the programme due to its complicated conditionality.

Budgetary processes at the time of writing are particularly uncertain in comparison with previous years. Compared to the forecast for the general government balance declared at the beginning of the year, and the appropriation in Hungary's Convergence Programme submitted to the EU in April 2020, the cash balance of the central subsystem deteriorates sharply: roughly one third of it due to lost tax revenues and two thirds to crisis management costs.

The summary of the macroeconomic trajectory and budgetary processes concludes with a review of the main risks.

Macroeconomic trajectory

Due to the crisis caused by the coronavirus epidemic in 2020 and the unexpected second wave, macroeconomic forecasts for even 2020 are extremely uncertain. The flash estimate of GDP for the third quarter will only become known in mid-November 2020.

World economic developments and external demand

Throughout 2020, the coronavirus epidemic will determine the evolution of the world economy as a result of simultaneous demand- and supply-side shocks and disruptions in global value chains. In addition to the deterioration in international economic relations, the crisis also has a significant and direct impact on commodity prices. The EU is the dominant market for Hungarian exports (with a share of about three quarters of total exports). The share of the German market in Hungarian exports increased to almost 28% by 2019.

According to the IMF's October 2020 outlook, the global economic output could fall by 4.4% this year, followed by a 5.2% growth in 2021. For the EU countries,

that are most relevant to us, the forecasts are much more pessimistic: for example, the euro area is expected to fall by more than 8% in 2020 and is expected to grow by only 5.2% in 2021. Within this group, Germany's decline is forecast to be more modest, at around 6%, but it is not expected to reach the 2019 level in 2021 either. The forecasts are similar for the catching-up European countries, including Hungary, where output contraction is projected to exceed 6% this year and the economy is expected to grow slightly below 4% in 2021.

Due to a drastic drop of demand, crude oil prices have fallen to a much greater extent than expected, around 30% this year. Oil price is expected to rise by somewhat over 10% in 2021.

Domestic processes in real economy

The structure of growth has changed steadily in recent years. Since 2017 capital accumulation has been the primary driving force of growth, while net exports have already made a negative contribution to the GDP. In 2019, the volume of GDP grew very dynamically, by 4.9%. Within this, actual household consumption increased by 4.4% and public consumption by 2%, while gross capital formation increased by 9.5% and gross fixed capital formation by 15%. The growth rate of imports (6.9%) exceeded that of exports (6.1%).

The economy still kept growing by 2.2% in the first quarter of 2020, but the GDP declined by a historic rate at 13.6% in the second quarter. Overall, this meant a decline of 6.1% for the first half of 2020 (seasonally and calendar-adjusted data show a slightly smaller GDP contraction of 5.8%).

In our view, a modest recovery could be expected for both production and consumption aggregates. The domestic policy measures taken so far appear to have been rather subdued in international comparison, focusing mainly on the supply side. We are confident that the drastic consumption decline could and should be mitigated by providing more generous income support to those who are in a difficult situation through no fault of their own, especially in the case of the poorest, where reserves may have been completely depleted. There is also a gradual depletion of business reserves in the sectors most affected by the crisis, which could lead to further lay-offs, exacerbating the economic and social effects of the crisis. Uncertainty is further increased by the fact that a further exacerbation of the epidemic could also force public closure ('lockdown') measures, similar to those in effect in spring.

Overall, therefore we expect an annual decline in GDP in excess of 6% in 2020. The recovery process is expected to be slow: even according to optimistic government forecasts, Hungary will only be able to reach the level of the first quarter of 2019 by mid-2022. While the global financial crisis ten years ago hit industrial sectors hardest, now the economic downturn caused by the coronavirus epidemic depresses the services sector more severely and for a longer term; as industry represents a large part of the Hungarian economy, contraction here may remain less severe than in various European countries with high share of tourism sector, as seen in 2020 Q2 data.

Consumption and income tendencies

The fundamental economic policy issue for 2020 is what measures can be taken to effectively mitigate (i.e. without significant imbalances) the collapse of domestic demand in the period of 2020–2022. The majority of domestic demand (more than 50%) is accounted for by household consumption expenditure, which continued to grow dynamically in 2019, by about 5%.

Only a small part of Hungarian households has significant savings, so a large decline in income is expected to have a serious unfortunate impact on the propensity to consume and thus on the volume of consumption expenditures. The problem is exacerbated by the fact that in the sectors most affected by the crisis, majority of those laid-off are not well-paid employees in senior positions, but lower-skilled workers first of all: the affected households are expected to curb their expenditures immediately. Therefore, in our opinion, the extent of the domestic real income loss was negatively affected by the fact that the income replacement support system only covered a relatively small circle in international comparison, and the rate of income replacement was not sufficient either.

Household consumption fell by 8.6% in the second quarter of 2020, consumer spending declined at a similar pace, while both gross and net earnings are reported to have grown dynamically in the first seven months of the year (at around 10%, representing an increase of 6.3% in real earnings). However, earnings statistics are not comprehensive: in the competitive (i.e. business) sector, only data of enterprises with more than 5 employees are included, and the statistics only include the earnings of full-time staff. Due to the gradual opening of the economy after the spring lockdown, some of the deferred consumption is expected to be replaced in the second half of the year, but a significant decline can be expected throughout the year. We expect household consumption to decline by 4.5% in 2020, to grow by about 3.2% in 2021, and to grow to a lesser extent in 2022. However, public consumption growth could be 4.6% this year and we expect growth of around 1% per year over the next two years.

Accumulation processes

In our original spring 2020 forecast we emphasized that economic policy should aim to stimulate investment demand during the period of recovery without a significant decline in the share of the corporate sector. The 13% decrease in national gross fixed capital formation in the second quarter of 2020 was mainly due to a more than 12% decline in investment by enterprises employing at least 50 people and a nearly 20% contraction in investment by public bodies. The downturn affected almost all sectors: businesses were forced to postpone their developments, mainly due to the deteriorating economic environment, while investment in EU projects in the public sector fell sharply. We expect the decline in gross fixed capital formation to exceed 8% by 2020 as a whole, with only a partial correction (an increase of only 4.6%) in 2021, with similar further increase in 2022.

External balance

In 2019, the current account balance was slightly in deficit, driven by a significant deterioration in the goods balance in the second half of the year. In 2020, only the first two months were "crisis-free", but the goods balance remained negative throughout the first half of the year, and the foreign trade surplus in services also shrank significantly. In the second quarter of 2020 the dynamics of both exports and imports fell sharply, with the former falling by 24% and the latter by almost 16%. Services were the main driver of this decline in both respects: the decrease in services exports exceeded 38%. Measured in euros, in the first seven months foreign trade in goods fell by about 10% in both directions, while the terms of trade improved. Taking into account the decline in the sectors affected by the crisis, including export-oriented manufacturing activities, we expect a total deficit of around EUR 1 billion by 2020 and a modest surplus by 2021–2022.

Prices

The official data on consumer price increases in 2020 will be close to the upper limit of the central bank's target, however, its actual value may be higher due to the transformation of the consumption structure's determining weights (weights used for the indicator are always calculated on the basis of the consumption two years earlier). The unprecedentedly weak forint exchange rate also poses a risk to inflation in the medium term. We expect a 3.8% increase in consumer prices this year and a slightly lower, 3.6% next year. In 2022, inflation may be around the middle of the target zone.

Sectoral effects

On the production side, the epidemic affected the manufacturing industry and the transportation and storage branch the most, which was mainly related to the shutdown of car factories. Industrial output fell by a third in April-May; for example, exports of vehicle production fell by almost 80% in April, and the decline was 55% in May. However, the industry corrected relatively quickly: the annual index of production in August was already only at –2.1%, so we do not expect a significant decline for the whole year.

In the medium and long term, the unfavourable development of European, especially German, industrial sales may pose a significant risk. The large-scale decline in construction output came late but exceeded 20% in July, while the recovery also appears to be slower: the year-on-year decline was over 10% for the January-August period. In addition to the use of EU funds in 2021, an increase in housing construction may also help the sector to recover at a moderate pace (further supported by the impact of reduced housing taxes and family support programmes). The further course of the epidemic will, of course, have a significant impact on sectors related to the "pleasure industry" in general, where the processes of 2021 can only be predicted with great uncertainty for the time being.

Labour market

The first and most direct economic effect of the crisis caused by the 2020 pandemic was the endangerment and loss of jobs. With the restriction of mobility in the spring, entire sectors were put at risk and some professions became temporarily almost redundant. Small businesses and sole proprietors who did not have abundant reserves had to temporarily (or permanently) suspend their operations due to lack of orders or interruptions in production chains. Depending on their capabilities, companies also tried to deal with the crisis by means of furlough, termination of fixed-term contracts, transition to part-time employment and creating the possibility of working from home.

The officially calculated employment level has fallen less than previously estimated, so we currently expect an average unemployment rate of 4.2% for 2020 as a whole, with upside risks. The rate may even rise in the last quarter of the year due to the decline in corporate financial reserves, despite the steady decline of the unemployment rate seen since mid-summer. The first phase of the government's wage subsidy programme was shut down at the end of the summer citing a lack of interest, and despite the second wave of the epidemic, there is no information yet on a possible restart (unlike in neighbouring countries where these programmes have been extended). In 2021–2022, we expect a gradual decline in the unemployment rate.

Budgetary developments

Due to the low interest rate environment and the weak forint exchange rate, there were few tools left for monetary policy to deal with the crisis in 2020, thus the task is basically on the fiscal policy to handle. Fiscal developments in the period under review are mainly determined by the recessionary processes caused by the coronavirus epidemic and the government's responses to them. The economic downturn primarily reduces budget revenues and drives up public expenditures, even if to a lesser extent. The measures taken by the government in this regard have had a mixed effect, including some revenue-raising and tax-decreasing as well as expenditure-increasing items.

Based on the data so far, the development of public finances is determined to a greater extent by the above-mentioned governmental reactions, while the impact of recessionary processes seems to be somewhat smaller. However, in many cases the two effects cannot be separated strictly. Among the most important revenue items in the budget, the enterprise tax contributions show significant failure – by about 35% – based on the data of the first half of the year (compared to the original budget plan). In this case, the recession processes and the government's crisis-mitigating measures are essentially reinforcing each other, as the budget has largely given up revenues that would have been lost anyway, due to the crisis. In the case of consumption-type taxes, a gap of 15–20% seems to be based on the data of the first six months – the gap may turn out to be less for the whole year, assuming that imports and consumption processes settle somewhat by the end of the year. The backlog of tax revenues originating from retails payments is the least; and it is not expected to show a decline compared

to last year's amount. In total, revenues may fall short of the appropriation by up to HUF 1,000 billion, which is close to 2% of GDP.

On the expenditure side, the effects of government measures are reflected in the Economic Protection Fund and the Epidemic Control Fund. The two funds together account for 4.3% of GDP – these account roughly for the increase in expenditures, compared to pre-crisis budget plans. This amount includes purchases of health equipment, investment grants, labour market subsidies, and tax and levy reductions. Although the government has made significant redeployments in the general government expenditure structure, the real share of additional spending on economic protection is lagging behind the German or Austrian level. Another important aspect is that a significant proportion of economic protection measures are one-offs, so they will not be automatically added to next year's budget.

Based on the above, we expect a deficit of 8.2% for this year, which could fall to close to 4% by 2021. The condition for the latter is a disciplined fiscal policy, meaning that the announced one-off measures are actually removed by the government parallel with the improvement of the economic situation. Only in 2022 can the deficit fall below 3% as a proportion of GDP.

Risk factors of the economic baseline scenario

In these exceptional circumstances, the macroeconomic trajectory outlined here is surrounded by much greater than usual uncertainty. In addition to the *epidemiological* aspect, four groups of factors were subjected to detailed analysis. These were:

- international *financial* relations
- international *production* and *trade* processes
- the development of the *behaviour* and *expectations* of economic actors and society
- the impact of *economic policy* measures.

International inflation in areas that matter for the Hungarian economy is low and, in the midst of uncertainty, the savings rate of households and companies has generally increased. The level of international interest rates is similarly low. However, due to the impact of increased global public spending, we can expect upward risks in the medium term.

In 2020–2021, financing Hungarian budget deficit will not encounter any difficulties. However, the external assessment of risks of the Hungarian state may change over time, and this would affect interest rate conditions. Standard & Poor's retained the *BBB* rating, changing only the "positive outlook" addition to "stable" (28/04/2020). Moody's review also confirmed Baa3 rating (an equivalent of BBB-), with "positive outlook" remark, adding that it expects a general government deficit of 7.3% in 2020 and a deficit of 3% of GDP in the coming years, and assumes that from 2022 onwards the Hungarian economy would be on a 3.5% growth trajectory (25/09/2020). Credit rating agencies perceive *extra uncertainty* resulting from the Hungarian

governance with reduced checks and balances; yet the July 2020 announcement of the EU's *seven-year budget* and its financial rescue package have greatly improved the region's financial prospects. It should be noted that as of summer of 2020, credit rating agencies qualified the region's epidemiological exposure as lower than the EU average. They also assume future access to the increased EU transfers. However, there are serious downward-pointing uncertainties in both of these respects.

At the end of the analysed period we expect rising nominal interest rates in Europe and also an upward inflation risk. Hungarian monetary developments are affected by the rise of unemployment and especially underemployment, the lack of households' money reserves and the persistence of the precautionary motives among those capable of accumulating savings. Based on these factors, we expect a significant decline in household consumption in 2020, followed by only a moderate increase in market demand thereafter. Still, following the large-scale weakening of the forint in 2020, the consumer price index will not fall back below 3%, and inflation expectations will strengthen.

Changes in foreign economic processes and transformation of value chains

Our calculations were based on the hypothesis that in Europe – the region that determines the Hungarian trade in goods and services – trade relations could be considered normal from May 2020 on, and the logistics conditions would remain adequate. However, the movement of persons was restricted in the spring and then again in September 2020. Such developments are difficult to quantify, but they pose a significant risk for the whole of 2020, affecting the operation of the Hungarian labour market and influencing the flow of income from services. Tensions in global trade indirectly pose a threat to Hungarian industry, mainly via key players of the supply chain (such as the German automotive industry).

The transformation of geographical locations of the global value chains received another impetus in 2020. In complex production chains, gestor companies are exploring the possibilities of alternative supply sources, shortening supply lines, accelerating automation and use of robots and spreading technologies without human contact. The Central and Eastern European region, the Hungarian economy included, may benefit from these relocation processes. There are signs of such interests in 2020, however, there are also opposite trends: the high degree of uncertainty, the possibility of suspending previously planned projects, the spill-over negative effects of the internal transformation in some large sectors (automotive industry).

Behavioural changes after a non-economic shock

There are other types of *uncertainties* in addition to the above risks of economic nature. Political risks increase; the responses of the authorities to the epidemic vary from country to country, even among neighbouring countries. Regulations governing the movement of persons and decisions on the closure of borders, which vary in

time and content from one country to another, are of a *political* nature, not only in terms of epidemiological professional considerations, but also when and in what form pandemic restrictions would be lifted. These decisions largely determine the framework of economic operations, most notably in case of tourism, but of other services too, that presuppose personal contacts, as well as the cross-border labour movement, which affects Hungary on both the issuing and the receiving side.

The norm-following ability of the Hungarian society is finite. If the government yields to popular demand and eases – from epidemiological aspect – prematurely the restrictions, the number of those affected and of casualties may increase, which later might necessitate restrictions again. The expected level of economic losses associated with further shutdowns is highly dependent on the level of digitization achieved by then. There are large differences in society and by employers in *the prevalence of telework options*. The institution of "home office" spread quite fast in the corporate community, but the picture is more mixed in public institutions and in the SME sector. Public education as a whole switched to distance learning with great effort in March 2020, but there were serious differences within society in this respect; and the case of laggards in several corners of the Hungarian society and in some regions remains a valid concern.

In 2020, border closures made employment relationships for those *working* partially or regularly *abroad* became very difficult, their revenues dwindled. The lack of *foreign scholarship students* and *exchange students* at educational institutions causes a loss of income, and together with the deterioration of domestic demographic conditions, it exacerbates the tensions arising from the existing excess capacities in the higher education sector.

The health care system, which has been in need of reforms and resource expansion for a long time, has been severely burdened by the first wave of the pandemic. The challenges of the second wave and the tensions associated with the transformation of doctors' pay and working conditions announced in October 2020 together represent significant risks for 2021. Existing regional inequalities in access to health care exacerbate the social problems of disadvantaged regions.

The crisis has accelerated the spread of digital business solutions, creating additional demand for *shared service centres* (SSCs). There are good opportunities in this economic sector in Hungary.

Our economic policy instruments must focus on retaining human capital

In addition to sustained inflation and rising inflation expectations, as well as the external depreciation of the forint, monetary policy has largely reached the limits of its ability to stimulate the economy. The rescue package drawn up in the spring of 2020 (moratorium on loan repayments, preferential corporate lending, job retention support, individual investment decisions) is one of the most modest in the region in terms of actual additional resources.

Due to the complexity of the application system and the uncertain business prospects of companies, only a part of the people in trouble could benefit from the three-month (!)

unemployment support scheme (the shortest income support coverage in Europe). The number of people leaving the labour market has increased; many have retreated to the informal economy and are in a fragile labour market status. Society's impaired capacity to retain valuable staff may increase the likelihood that when demand returns in a given industry, firms may face a shortage of labour while the former employees, who had to find alternative employment somewhere, will not be as productive as before the crisis as they could have been within the original corporate framework and their contribution to GDP (and their ability to pay taxes) may also be lower.

The financial fragility of the SME sector is also a downside risk factor. Similarly, half of the households have no financial savings and even a temporary loss of income may lead to social tensions. The present 90-day time frame for job-search assistance should be extended under the present hectic labour market conditions. Increasing income transfers would be a much more effective and equitable tool in boosting aggregate demand than supporting corporate investment or housing construction.

* * *

As a result of the epidemic, in 2020 the Hungarian economy will have to face a recession of around 6%, the return to previous levels is only possible in 2022. The crisis can be managed primarily through fiscal means. Due to the crisis management efforts, the central government deficit as a share of GDP may exceed 8% in 2020, and the deficit will not fall below 3% next year. Public debt is expected to exceed 76% of GDP in 2020 and will presumable remain above 70% even in 2022. Medium-term developments are influenced by significant risk factors, such as the international financial conditions, developments in international production and trade flows, the expectations of economic agents, and the actual effects of economic policy measures. Retaining human capital must be a priority economic policy goal.

Appendix
Main macroeconomic indicators in Hungary, 2020–2022 (%)

	2020	2021	2022
GDP (volume)	–6.1	4.5	3.0
Household consumption (volume)	–4.5	3.2	2.8
Collective consumption (volume)	4.6	1.2	0.9
Gross fixed capital formation (volume)	–8.2	4.6	4.2
Exports (volume)	–8.1	6.0	4.5
Imports (volume)	–5.0	5.4	4.3
Unemployment rate	4.2	4.0	3.8
Consumer price index	3.8	3.5	2.8
Current account balance (M EUR)	–980	–295	240
ESA balance (as % of GDP)	–8.2	–4.3	–2.9
Gross government debt (as % of GDP)	76.1	74.1	71.2

Source: HCSO, MNB, own forecasts.

GYULA PULAY (ED.)[1]

Impact of the COVID-19 epidemic on macroeconomic and budgetary developments in the first half of 2020

Introduction

Pursuant to Act No. CXCIV of 2011 On the Economic Stability of Hungary (hereinafter: the Stability Act), the Fiscal Council issues an opinion every six months on the state of implementation of the Act on the Central Budget and on the expected development of public debt. The State Audit Office, whose president is a member of the Council, assists the Council in the performance of its duties by providing analyses and findings related to the issues discussed by the Council. The analysis prepared for this purpose provides a comprehensive picture of the budgetary developments in the first half of 2020, as well as the governmental decisions and macroeconomic conditions that determine them. In addition, based on data already available early September, it shows how the central budget situation changed in July-August. The analysis reveals the risk factors that affect the development of the general government deficit and debt for the year as a whole. However, it does not quantify the risks, as the Basic Law and the Stability Act do not impose an obligation to reduce the government debt ratio in the event of a decline in the real value of GDP, which may be waived to the extent necessary to restore economic balance. The present analysis is a condensed version of the analysis prepared by the SAO, which highlights the most important effects of the coronavirus epidemic on the economy and the budget.

Method of analysis

The analysis was prepared by using publicly available domestic and international documents, the legislation related to the domestic emergency, the documents requested by the SAO from the Ministry of Finance (PM) and the Ministry of Innovation and Technology (ITM), and the Hungarian State Treasury (Treasury), on the basis of the documents sent monthly by the National Tax and Customs Administration (NAV), as well as the quick briefings prepared by the CSO and the processing of STADAT data.

[1] This paper is the abridged version of the analysis of the fiscal processes in the first half of 2020, prepared by the State Audit Office for the Fiscal Council.

In the course of the analytical work, we assessed the correlations between budgetary and macroeconomic processes. In the analysis, we took into account that during the emergency, three government decrees were issued, which formulated a derogation from the Budget Act. The measures taken to compensate for the effects of the coronavirus were taken into account in the development of the appropriations, therefore in some cases we compared the fulfilment of each item with the appropriations modified by the government during the emergency instead of the original statutory appropriations. In the evaluation, we took into account that, due to the measures, some appropriations are in some cases delayed in the second half of the year. We assessed it as risky if, on the basis of time-proportionate performance, lower-than-planned end-of-year performance is expected in the case of revenue appropriations and higher-than-planned performance in expenditure appropriations is expected.

Restructuring the budget in the light of the emergency

To address the consequences of the coronavirus epidemic, the Government declared a state of emergency in March 2020. In an emergency, the Government has the power to lay down rules different from the current budget law, i.e. to substantially amend the budget. The Government exercised this power and, by Government Decree 92/2020 (IV. 6.) On the Different Rules of the Hungarian Central Budget for 2020 Related to the Emergency Situation, amended the 2020 budget law for the duration of the emergency situation and carried out structural changes. The Government decree, in order to contain the epidemic and restart the economy, established the Epidemic Control Fund as Chapter XLVI of the budget, Chapter XLVII as the Economic Protection Fund and Chapter XLVIII for Funds Against the Pandemic Received from the European Union. Pursuant to the decree, the name of the National Protection Fund was changed to the Central Reserve for Epidemic Control. The title of the Job Retention Programme was created within the National Employment Fund, and the Fund's appropriations were transferred to the Economic Protection Fund chapter.

Following the cessation of the emergency, the Parliament amended the 2020 Budget Act with Act LX of 2020, and in this it adopted the structural changes according to the Government decree, so they remained in force even after the end of the emergency.

Development of the macroeconomic environment of the budget in the first half of 2020

In the first quarter of 2020, the volume of GDP increased by 2.2% compared to the same period of the previous year, but in the second quarter, however, it decreased by 13.6% year-on-year.

Compared to the same period of the previous year, agriculture decreased by 2.1%, while industry shrank by 20.1%, construction by 13.2% and services by 12.2%. The contribution of each branch of the national economy to GDP growth in the second quarter of 2020 is shown in Table 1.

Table 1
Contribution to GDP growth (percentage points)

Contributing branch		2020 Q2 (%)
Agriculture		–0.1
Industry		–4.3
of which	*manufacturing*	–4,2
Building industry		–0.7
Services		–6.8
of which	*trade, car repair, accommodation services, catering*	–1.4
	transportation, storage	–1.2
	information, communication	–0.1
	financial and insurance activities	0.1
	real estate transactions	–0.5
	professional, scientific, technical, administrative and support service activities	–1.3
	public administration, defence; compulsory social security, education, human health and social work activities	–1.9
	arts, entertainment, leisure, other services	–0.6
Volume change in GDP		–13.6

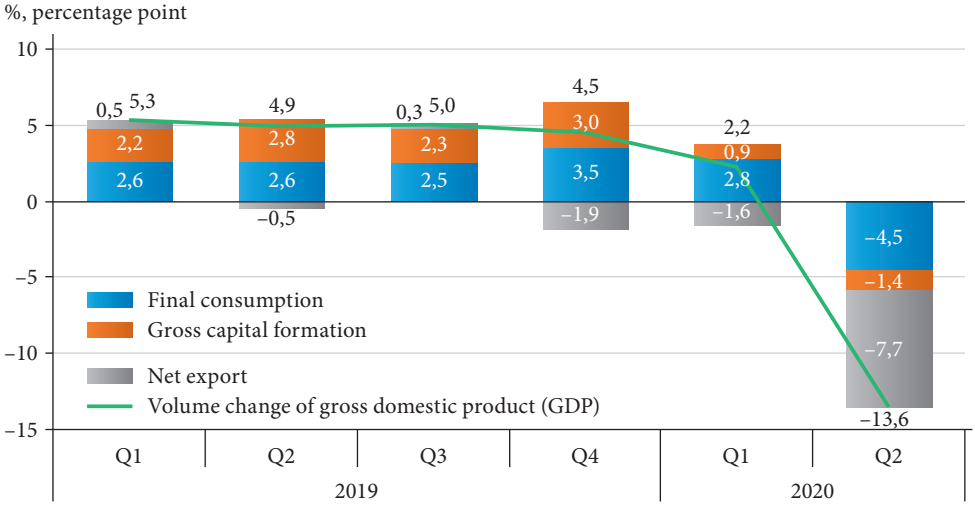
Source: HSCO STADAT data, SAO ed.

Services contributed the most to the decline in GDP. Outages due to the coronavirus epidemic have resulted in a drastic decline in education, human health care, accommodation-services and catering. In the second quarter of 2020, the contribution to economic growth of all sectors became negative, with the exception of financial and insurance activities, which achieved modest growth.

On the consumption side, the decline in GDP was mainly due to a drastic deterioration in the foreign trade balance (–7.7 percentage points). The decline in final consumption contributed –4.5 percentage points to the decline in GDP. The decline in gross accumulation pushed back economic performance by 1.4 percentage points (see Figure 1).

It can be seen from Table 2 that in the second quarter of 2020, actual household consumption decreased by 8.6% year-on-year. Household consumption expenditure decreased by 8.4%. Social benefits in kind received from the government fell even more (11.1%). The volume of social benefits in kind received from non-profit institutions serving households decreased by 0.2%. In contrast, the volume of public consumption increased (5.8%). Overall, the above factors resulted in a 6.6% decrease in final consumption.

Figure 1
Contribution to GDP, consumption side



Source: HCSO STADAT, SAO ed.
For detailed data, see Table 2.

Table 2
Volume indexes of GDP final consumption

Consumption factor		2020 Q2 (%)
Household consumption expenditure		91.6
Social benefits in kind from government		88.9
Social benefits in kind from non-profit institutions serving households		99.8
Actual household consumption		91.4
Public consumption		105.8
Total final consumption		93.4
Gross fixed capital formation		86.5
Total gross accumulation		95.0
Total domestic use		93.9
Exports	Goods	80.1
	Services	61.9
	Total	76.0
Imports	Goods	85.0
	Services	79.7
	Total	84.2
Gross domestic product (GDP)		86.4

Source: HCSO STADAT data, SAO ed.

Following the increase in gross fixed capital formation in 2019, in the second quarter of 2020 it decreased by 13.5% year-on-year. The coronavirus epidemic adversely affected the volume of investments. Compared to a year earlier, gross accumulation decreased by 5%. The balance of foreign trade turnover was HUF –53.2 billion in the second quarter, which is not only lower than in the same period of the previous year (HUF 614.8 billion), but also differs from the trend going back several years. The balance was greatly affected by the significant contraction in world trade and the border closure introduced as a disease control measure. The last time Hungary's foreign trade balance was negative was in the fourth quarter of 2008. Overall, the volume of exports decreased by 24% and that of imports by 15.8% compared to the same period of the previous year. The decline can be observed for both trade in goods and services.

One of the most important elements of final consumption is retail turnover, whose business types were affected very differently by the coronavirus epidemic (see Table 3). In the first quarter, at the beginning of the epidemic in Hungary, the turnover of food products, computer equipment, medicines and medical products increased significantly. In the second quarter, the largest decline was in April, in almost all business types, due to curfew and other restrictions. Only parcel and internet purchases showed remarkably high growth at the time: traffic in this category more than doubled.

Table 3
Volume index of retail trade turnover by type of business in the first half of 2020
(same period of the previous year = 100.0%)

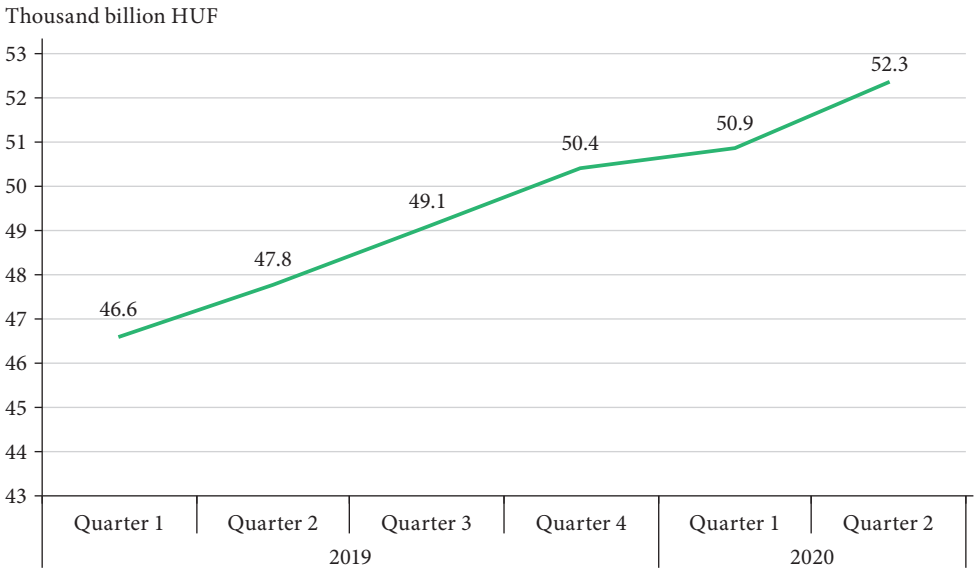
Type of business	Jan.	Feb.	March	Apr.	May	Jun.
Food and miscellaneous food, beverages, tobacco	104.9	110.7	112.7	99.6	101.8	98.5
Manufactured goods	120.1	123.7	100.9	91.8	113.4	114.7
Textiles, clothing and footwear	107.6	107.0	49.0	10.2	59.8	85.8
Furniture, technical articles	109.7	105.6	94.5	76.2	100.6	109.0
Book, newspaper, paper products	101.4	101.9	71.8	33.7	52.2	82.8
Computer technology, other manufactured goods	121.7	121.3	91.3	66.9	91.5	117.2
Medicine, medicinal products	100.9	114.4	154.2	94.3	83.1	96.5
Perfumes	108.8	115.5	119.0	71.4	82.9	99.7
Used items	109.0	99.1	76.8	20.4	52.4	77.1
Parcel delivery and internet	129.7	130.7	148.6	203.5	149.2	137.2
Automotive fuel	101.4	101.1	84.8	73.7	84.4	90.5
Motor vehicle, vehicle parts	126.6	116.8	95.4	66.9	77.3	92.3

Smallest values — Largest values

Source: HCSO STADAT data, SAO ed.

Given the large decline in consumption, we examined how the net financial wealth of households developed as a result of unspent income. An interesting question is whether the economic downturn has halted the growth in net financial assets of households in recent years. The answer to these questions can be found in Figure 2.

Figure 2
Net financial wealth of households



Source: HCSO STADAT data, SAO ed.

It can be seen that the growth of households' net worth in the first quarter of 2020 did not reach the level of the previous quarters, but in the second quarter the growth accelerated again, with an increase of HUF 1,456.2 billion. During the first half of 2020, the net worth of households increased by HUF 2,445.3 billion. This is of great importance as this growth provides a cover for a significant part of the soaring public debt to be financed by household savings.

Revenues and expenditures of the central budget

Tax revenues

Table 4 shows that tax revenues in the first half of 2020 were fulfilled on a time proportion basis.

Among the payments made by business actors, we highlight the taxes by paid small taxpayers, in the case of which the consequence of the benefits brought to alleviate the effects of the coronavirus epidemic can be seen.

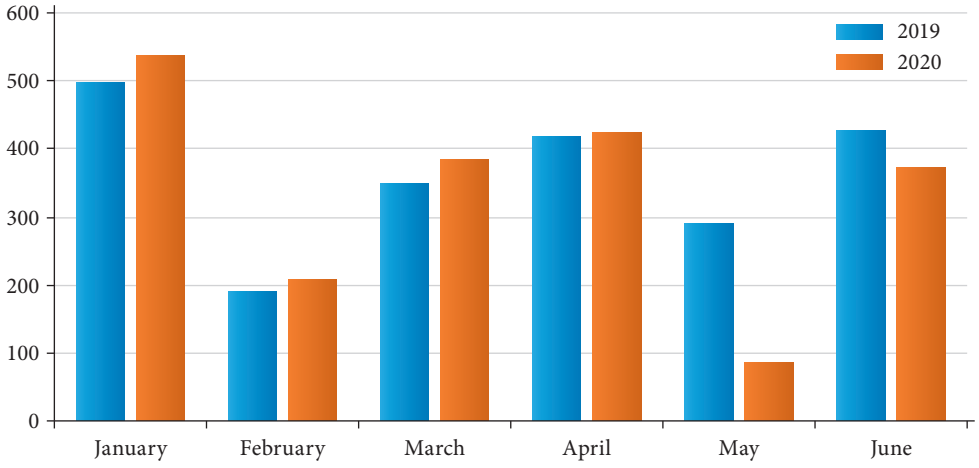
Table 4
Main tax revenues in 2019 and 2020 (first half-year)

Appropriation title	Performance in the first half of 2019 as a percentage of the annual appropriation	Performance in the first half of 2020 as a percentage of the annual appropriation
Budget contributions of businesses	63.4	43.6
Corporate tax	32.6	37.6
Taxes paid by small taxpayers	56.4	39.0
Taxes related to consumption	50.3	41.6
Value added tax	50.6	40.4
Excise duty	47.7	44.2
Budget contributions of the population	49.7	46.9
Personal income tax	48.9	46.4

Source: Treasury data, 2020, June, SAO ed.

The largest tax revenue of the budget comes from VAT, therefore its development is presented separately (see Figure 3).

Figure 3
VAT revenues in the first half of 2019 and 2020 (billion HUF)



Source: based on Treasury data, SAO ed.

Consumption-related taxes include the tourism development contribution, which was expected to grow strongly this year, with 131.6% higher revenue planned than in 2019. However, the impact of the epidemic was perhaps the most drastic in this sector; the turnover dropped significantly, and according to Government Decree 47/2020 (III. 18.) from March to four months, i.e. until the end of the first half of 2020, the tourism development contribution was not to be declared nor paid. Hence in the first half of 2020, only 25.4% of the appropriation was achieved.

In the first half of 2020, households's budget contribution met 46.9% of the yearly appropriation, which is the smallest lag proportionally. The personal income tax was fulfilled by 46.4% in the first half of 2020. The reason for the lag to the time-proportionate values is the slower-than-planned increase of the labour incomes. In the business sector, consolidated labour income fell by 3.1%, while in the public sector it rose by 5.2%. Due to the epidemiological emergency, many benefits have become tax-free, which also has a negative impact on tax revenues.

From car tax, 87.6% of the planned revenue of the central budget for 2020 was fulfilled. The higher than time-proportionate performance was due to the reallocation of revenues from local governments to the central budget.

Development of revenues and expenditures of the three new funds

The Epidemic Control Fund (JEVA) was established with a resource limit of more than HUF 633 billion, almost 60% of which is the Central Reserve for Epidemic Control, which is an appropriation left open from above. 50% of the political parties' budgetary support was transferred to this Fund, and further budget transfers were made in the amount of HUF 47 billion. JEVA also includes a HUF 55 billion contribution from the financial sector and banks, a HUF 36 billion retail tax on multinational retail chains, a HUF 34 billion motor vehicle tax from local governments to the central budget, and a previously decided increase in salaries for healthcare professionals and nurses in the amount of HUF 82 billion.

JEVA expenditures include – according to the Government Resolution 1684/2018 (XII. 17.) on the salary development for health professionals and nurses for the years 2019–2022 – the increase and the one-time salary supplement for healthcare workers in 2020. The largest part of expenditure is the investment in assets decided or implemented already before the regulation came into force.

Based on government decisions published by June 30, 2020 from JEVA an amount of HUF 642,225.7 million was used, which is an excess of HUF 216.0 billion compared to the Central Reserve for Epidemic Control.

The resources of the Economic Protection Fund (hereinafter: GVA) are provided on the one hand by the savings of the central institutions and programmes (68.6% of all resources) and on the other hand the appropriations of the National Employment Fund are transferred to the Economic Protection Fund chapter.

Based on government resolutions published by 30 June, HUF 872.9 billion was used from the appropriations of the Economic Protection Programmes. In May-June 2020, a total of HUF 6,916.3 million was paid from the National Employment Fund in connection with the emergency situation under the title "Job Retention Programme" according to the data of the Ministry of Finance. Of this, HUF 5,317.8 million was paid to support reduced working hours caused by the coronavirus epidemic, the aim of which is to maintain jobs.

No funds were received from the European Union for the Anti-Epidemic Grants Fund from the European Union, so no expenditure was incurred either.

Development of EU development expenditure appropriations and EU revenues

In the 2020 budget, HUF 1,682.3 billion in expenditure and HUF 1,496.1 billion in revenue appropriations were set aside for EU investments and development programmes. The deficit of the European Union development budget in the first half of 2020 was HUF 388.2 billion. The deviation from the planned deficit was due to expenditure overruns and revenue shortfalls (see Table 5).

Table 5
Development of EU revenues appropriations of the central budget

Appropriation title	Original appropriation	Completion for the first half of 2020	Completion as a percentage of the initial appropriation
	billion HUF	billion HUF	%
Ch. XIX. EU development programmes revenues	13.2	199.2	1509.1
Ch. XLII. EU programme revenues	1482.0	486.3	32.8
Ch. XLII. Other EU revenues	17.1	9.4	55.0
Other, EU development funds appearing in misc. chapters	0.9	1.9	211.1
Total:	1513.2	696.8	46.0

Source: 2020 budget law and Treasury data, SAO ed.

The amount of European Union expenditures in the first half of 2020 amounted to HUF 1,085.1 billion, which corresponded to 64.5% of the original appropriation for 2020. Table 6 summarizes the development of the European Union's central budget expenditure in the first half of 2020.

Table 6
Development of the EU expenditures appropriations of the central budget

Appropriation title	Original appropriation	Completion for the first half of 2020	Completion as a percentage of the initial appropriation
	HUF billion	HUF billion	%
Ch. XIX. EU development programmes expenditures	1657.8	1069.6	64.5
Other, EU development expenditures appearing in misc. chapters	24.5	15.5	63.3
Total:	1682.3	1085.1	64.5

Source: 2020 budget law and Treasury data, SAO ed.

Development of revenues and expenditures related to state assets

Payments related to state assets developed favourably, exceeding the original annual appropriation as early as by the end of June. The HUF 128.8 billion from radio frequencies utilisation and the HUF 32.7 billion from the sale of emission allowances (carbon dioxide quota) contributed significantly to this.

The HUF 461.5 billion in statutory appropriations for expenditures related to state assets was already at 40.7% by the end of June. Of the amounts related to state property expenditures by the end of June HUF 118.9 billion were related to companies, HUF 52 billion to real estate and personnel and HUF 17 billion were other expenses.

Development of central budget subsidies to local governments

In Ch. IX. Subsidies of local governments the National Assembly provided HUF 710.9 billion to local governments for operating purposes, HUF 28.1 billion for accumulation purposes, a total of HUF 739.0 billion for local governments, which is HUF 10.1 billion higher than the 2019 statutory appropriation. A total of HUF 14.8 billion in appropriations was transferred from this chapter to another chapter in the first half of 2020, which was 2.0% of the annual grant amount. During 2020, the Government created new support labels under its authority. By June 2020 expenditure appropriations were increased by a total of HUF 17.7 billion on these new labels, 56.5% of which was transferred within chapters. The changes in appropriations are summarized in Table 7.

Table 7
Modifications of Ch. IX. Local government subsidies

Label	Name	Appropriation modification I-VI.
1.	Supporting the general operation and sectoral tasks of local governments	–15.3
2.	Additional operating subsidies for local governments	–2.9
3.	Additional accumulation subsidies for local governments	–6.6
	Total reductions:	–24.8
4.–20.	Appropriations for new items	+17.7
	Total change in appropriations	–7.1

Source: Treasury 2020 budget execution data, June 2020, SAO ed.

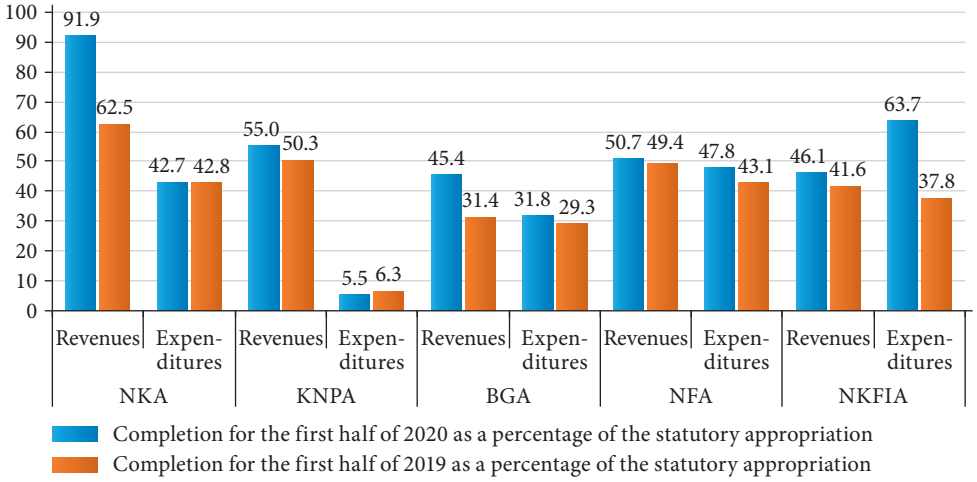
Pursuant to Section 6 of Government Decree 92/2020 (IV. 6.), by amending the appropriation Local Government Subsidies chapter HUF 46.9 billion was transferred to the Central Reserve for Epidemic Control by the second quarter of 2020. The appropriations for said chapter amounted to HUF 355.3 billion, which is 48.5% of the amended appropriation.

Development of revenues, expenditures and balances of segregated public funds

For the separated public funds such as the National Research, Development and Innovation Fund (NKFIA), the National Employment Fund (NFA), the Bethlen Gábor Fund (BGA), the Central Nuclear Financial Fund (KNPA) and the National Cultural Fund (NKA) (hereinafter together: ELKA), the revenue appropriations were set by the Budget Act of 2020 in the total amount of HUF 633.6 billion, while the expenditure appropriations were in the total HUF 641.7 billion. Based on the performance data of months January through June of 2020, the revenue appropriations exceeded the time-proportionate amount of the statutory appropriation, and were realized at 50.5%, while the expenditure appropriations were lower than the time-proportional amount of the statutory appropriation, being at 48.0%. ELKA achieved a surplus of HUF 11.2 billion.

Expenditure appropriations of the NFA, appropriations from which the state covers, *inter alia*, job-search allowances for the unemployed, the salaries of public workers and other costs of the public works scheme programme. These are all expenditures that have steadily increased in the epidemic-induced crisis. In terms of the amount of NFA expenditure appropriations, the most significant appropriation is the Start work programme, which, based on the amount planned for 2020 (HUF 140 billion), accounts for 32.5% of the expenditure. By the end of June 2020, it was HUF 64.8 billion, or 46.3%. The fulfilment of passive expenditures, which represents the amount spent on job-search benefits, was significantly higher than the planned rate of fulfilment over time. Out of the planned HUF 83.0 billion, HUF 69.0 billion has already been paid, which is 83.2% of the 2020 appropriation. Figure 4 compares the fulfilment of ELKA's revenue and expenditure appropriations in the first half of 2020 with the performance data of the same period in 2019.

Figure 4
Comparison of ELKA's performance data of budget appropriations for the same period in 2019 and 2020, %



Source: Treasury 2020 budget execution data, 2020.06., SAO ed.

Based on the data in the figure, in the case of NKFIA, a risk is probable in terms of both revenue and expenditure appropriations, given that on a *pro rata* basis the lower-than-planned performance of revenue appropriations and the higher-than-planned end-of-year performance of expenditure appropriations are expected. As a result of the economic impact of the coronavirus pandemic, the revenue from innovation contributions paid by companies is expected to decrease, in parallel with more support from the NKFIA for R+D+I in terms of expenditure appropriations.

Based on the outturn figures for the first half of 2020, no risk is likely for the NKA and KNPA in terms of either revenue or expenditure appropriations, given that, on a *pro rata* basis, revenues are expected higher, while expenditures are expected lower than planned for revenue appropriations by the end of the year.

In addition to the above, it should be noted that for NFA, both revenue and expenditure appropriations are affected by the negative effects of the coronavirus pandemic, even if this is not so clear from the half-yearly data. In the case of the appropriation "Passive expenditure – Jobseeker's allowance", on the basis of monthly performance data, it can be observed that monthly expenditure has been steadily increasing since January 2020, the amount of disbursement in June is seven times higher than in January 2020. The execution of the appropriation in relation to the statutory appropriation reached 83.2%, on the basis of which it can be considered as a risky appropriation in itself.

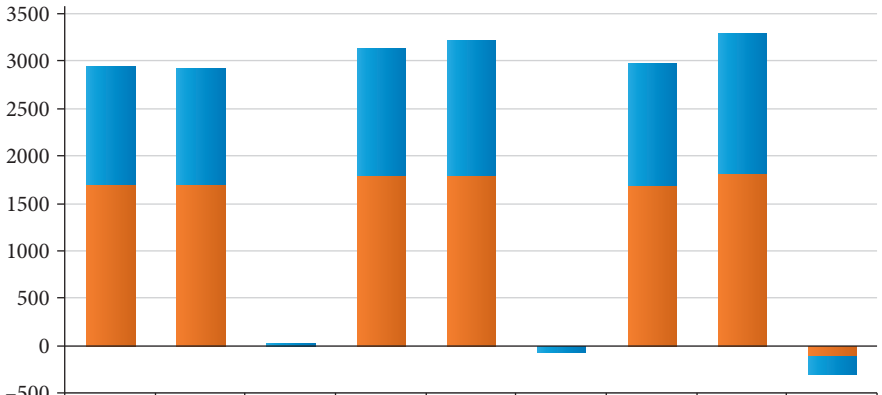
Development of revenues, expenditures and balances of Social Security Funds (SSF)

The budgets of social security financial funds (SSF funds) such as the Pension Insurance Fund (PIF) and the Health Insurance Fund (HIF) were set as balanced by the 2020 Budget Act. The balance of SSF funds developed unfavourably in the first half of 2020, compared to the same period of 2019 and the planned amount (see Figure 5).

On the revenue side, the most significant item for both funds comes from the social contribution tax and contributions, which account for 90% of the revenue appropriations of the SSF. In the first half of 2020, the tax and contribution revenue of SSF fell short of the time-proportionate amount by 5.9 percentage points. One of the main reasons for this is that according to the provisions of Government Decree 61/2020 (III. 23.), individuals employed in endangered sectors and employment had to pay only personal income tax and health insurance contributions. In addition to the above, the employers did not have to pay social contribution tax and the vocational training contribution, and the rate of the rehabilitation contribution was reduced to two-thirds of the otherwise applicable rate.

The risk of revenue shortfalls may be further increased by changes in legislation affecting SSF, effective as of July 1, 2020. Under the new regulation, the rate of social contribution tax will be reduced from 17.5% to 15.5%, pensioners in their own right will be entitled to a general contribution exemption, and the payer will also be exempted from paying social contribution tax if he employs a pensioner in his own right. The family contribution discount becomes deductible against the full social

Figure 5
Comparison of Social Security Funds' performance data 2019–2020



	Performance in the first half of 2019 (HUF billion)			Calculated legal appropriation for 2020, pro rata temporis (HUF billion)			Performance in the first half of 2020 (HUF billion)		
	Revenues	Expend.	Balance	Revenues	Expend.	Balance	Revenues	Expend.	Balance
HI. Fund	1232.9	1214.9	18.0	1341.3	1412.6	–71.3	1284.0	1482.5	–198.5
PI. Fund	1703.8	1705.5	–1.7	1793.9	1793.9	0.0	1688.9	1804.3	–115.4

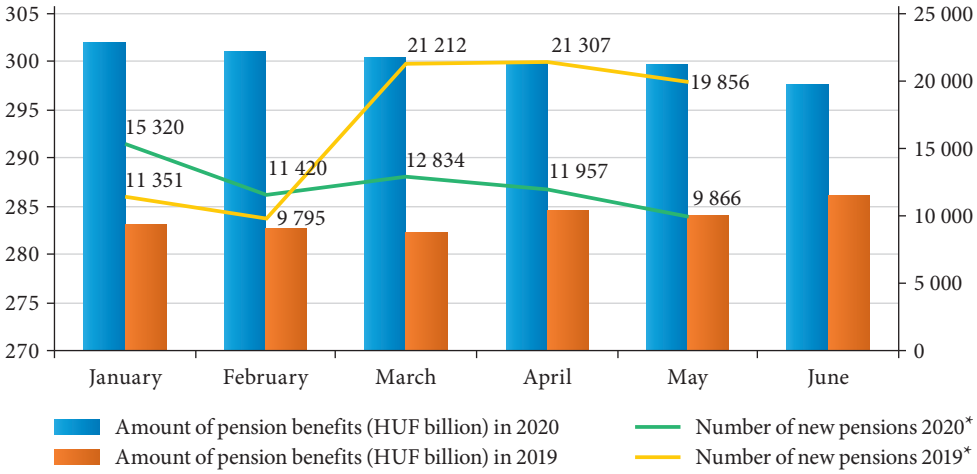
Source: Treasury data, SAO ed.

security contribution of 18.5%. In addition, a lower contribution limit has been set, according to which, in the case of employed persons, the social security contribution will have to be paid after at least 30% of the minimum wage, even if the employee's actual income is lower.

Based on the performance data of the pension fund in the first half of 2020, revenues were 2.9% lower than time-proportionate, while expenditures were time-proportionate. As a result, the balance of the pension fund showed a deficit of HUF 115.4 billion by the end of the first half of 2020. The expenditure appropriation of the pension fund consists essentially of one item, the appropriation of pension benefits, which was fulfilled on a *pro rata temporis* basis (50.3%). Nevertheless, the pension fund is expected to outperform by the end of the year. The background to this is illustrated in Figure 6.

The figure clearly shows that in the first six months of 2020, pension benefits were paid in larger amounts compared to the same period in 2019, despite the fact that new benefits were established in fewer cases. This discrepancy can be explained, on the one hand, by the increase of pensions and, on the other hand, by the increase in net average earnings: the new benefits were set at a higher amount. However, the number of new pensions is expected to increase significantly in the first half of the year. This is because the age limit for old-age pensions has risen by half a year, to 64.5 years from 1 January 2020. As a result of the six-month age increase, those become entitled to old-age pension who became 64.5 years old in the first half of 2020, but are entitled only from the second half of 2020. Therefore, in the first half of 2020, no new benefits were established beyond the closure of pending cases. Due to the above, the number

Figure 6
Comparison of performance data for pensions in the first half of 2020 and 2019



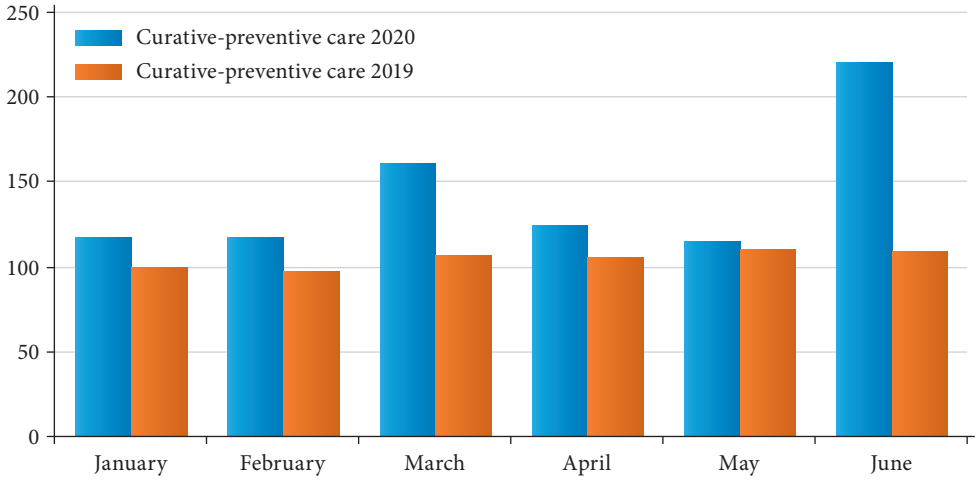
Source: Treasury and HCSO data, SAO ed.
* Based on the decisions made, the data of the HCSO on the number of new pensions and other benefits were available for the period from January to May 2020; therefore the data for 2019 are also included for same period.

of new pensioners will increase significantly in the second half of the year. The pension fund's expenditure in the second half of the year will be further increased by the need to increase pensions due to inflation in excess of 2.8%.

Based on the decision by the Government, the budget balance of the Health Insurance Fund, which was initially set at zero, changed to a deficit of HUF 142.6 billion. Based on the performance data for the first half of 2020, revenues were 2.1% lower than the time-proportionate, while expenditures were 2.5% higher, as a result of which the balance of the Health Insurance Fund closed with a deficit of HUF 198.5 billion at the end of the first half of 2020. On both the revenue and the expenditure sides, unfavourable developments emerged, mainly due to the coronavirus pandemic, of which the following are highlighted.

The Budget Act of 2020 provided for expenditure of HUF 1,429.3 billion on health insurance benefits in kind. The Government amended this to HUF 1,573.3 billion in connection with the additional tasks caused by the coronavirus pandemic. Expenditures amounted to HUF 855.7 billion in the first half of 2020, which is a time-proportional over-execution compared to the amended appropriation. The significant increase is due on the one hand to the 14% increase in the salaries of healthcare professionals and nurses on from 1 January 2020 and on the other hand to the amount of the one-off extraordinary benefit (HUF 101.3 billion) affecting healthcare professionals. In addition, the additional funding for debt settlements in February and March also increased spending. The appropriation of the Health Insurance Fund's curative-preventive benefits compared to the fulfilment data of the first half of 2020 to the data of the same period of 2019 is shown in Figure 7.

Figure 7
Performance data for the curative-preventive care appropriation for the first half of 2019 and 2020



Source: Treasury http://www.allamkincstar.gov.hu/hu/koltsegvetesi-informaciok/koltsegvetesi-informaciok/.

The figure illustrates well that in the first six months of 2020, an increasing amount of expenditure on curative-preventive care was spent month-by-month compared to the same period in 2019.

Another significant item of expenditure in the Health Insurance Fund is pharmaceutical subsidies. In the first six months of 2020, HUF 203.0 billion was spent on pharmaceutical subsidies, HUF 5.7 billion more than the time-proportionate rate.

Development of the cash deficit

Figure 8 illustrates the evolution of the major cash-flow data of the public finance central subsystem, based on the data of the first half of 2020.

The Budget Act of 2020 established the deficit of the central subsystem of public finances in 2020 at HUF 367.0 billion, which, in addition to a zero-balance operating budget, is composed of the deficit of the accumulation budget at HUF 180.8 billion and the deficit of the EU development budget at HUF 186.2 billion.

The cash deficit of the central government general subsystem in the first half of 2020 was HUF 1,837.0 billion, which is related to the impact of the coronavirus epidemic on budget revenues and expenditures. The balance of the central government general subsystem in the first half of 2020 consisted of a HUF 1,534.3 billion deficit of the central budget, an HUF 11.2 billion surplus of segregated state funds and a HUF 313.9 billion deficit of social security financial funds.

The development of the main cash flow data of the central government subsystem is illustrated in Table 8, based on the data of the first half of 2020.

Table 8
Development of the main cash flow data of the central government subsystem in the first half of 2020

	Year 2020 appropriation (in HUF)	Performance for the first half of 2020 as a percentage of the 2020 appropriation
Balance of the central budget	–359.0	427.4
Revenues	14 522.9	51.0
Expenditures	14 881.8	60.1
Balance of Social Security Funds		
Revenues	6 269.5	47.4
Expenditures	6 269.5	52.4
Balance of separated government funds	–8.0	
Revenues	633.6	48.4
Expenditures	641.7	46.0
Balance of the central subsystem	–367.0	500.5
Revenues	21 426.0	49.9
Expenditures	21 793.0	57.5

Source: Treasury data 2020.03-06, SAO ed.

The development of the cash deficit shows completely different characteristics compared to the data of the first half of 2019, due the completely different environment related to the epidemic. Last year, in the first six months of the year, the planned annual deficit was met at only 39.1%. In the first half of 2020, the deficit is not only a time-proportionate value, but also significantly exceeded the amount planned for the whole year.

Development of the debt of the central subsystem of public finances, evaluation of the safe financing of public debt

The data on the debt of the central subsystem of general government for 2019 and January-July 2020 are summarized in Table 9.

The previous trend, according to which the share of forint-denominated debt increased continuously, was reversed. The share of foreign-currency debt increased from 17.3% at the end of 2019 to 18.2% because of the April 2020 foreign-currency bond issues. In terms of the composition of forint debt, the stock of loans decreased by HUF 46.5 billion and the stock of retail government securities by HUF 608.4 billion from the end of 2019 to July 2020, thus the increase in forint debt was financed by the increase in government bonds and discount treasury bills. The development of the stock of retail government securities was affected by the temporarily declining demand for retail government securities. The interest of foreign investors remained the same.

Table 9
The development of central government debt, December 31, 2019 and July 31, 2020

Debt stock	December 31, 2019		July 31, 2020		Change	
	HUF billion	%	HUF billion	%	HUF billion	%
Credit	1 208.1	4.1	1 161.6	3.7	–46.5	–3.8
Government bond	13 417.7	45.2	15 330.9	48.2	1 913.3	14.3
Retail government securities	9 074.0	30.6	8 465.6	26.6	–608.4	–6.7
Discount treasury bill	657.3	2.2	818.1	2.6	160.8	24.5
Total forint debt	*24 357.1*	*82.1*	*25 776.3*	*81.1*	*1 419.2*	*5.8*
Foreign currency debt	*5 121.2*	*17.3*	*5 794.2*	*18.2*	*673.0*	*13.1*
Other liabilities	*203.7*	*0.7*	*208.6*	*0.7*	*5.0*	*2.4*
Grand total	29 682.0	100.0	31 779.1	100.0	2 097.2	7.1

Source: Treasury data July 2020, SAO ed.

Some features of the July-August 2020 budgetary processes

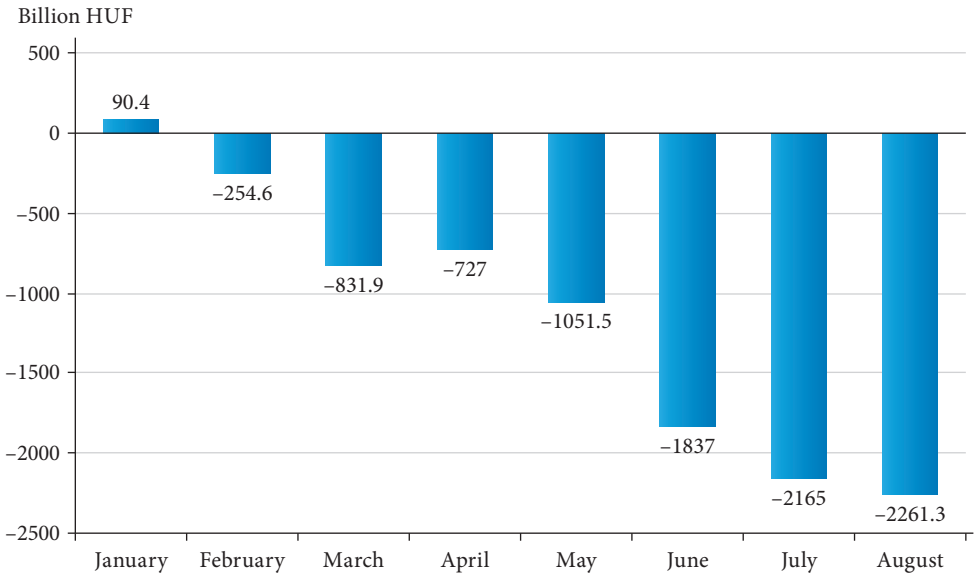
The budget deficit continued to rise in July and August 2020, but to a lesser extent than before. The increase in the deficit was moderated by the fact that the budget received almost HUF 300 billion revenue on the EU programme appropriations in two months. Figure 8 shows the development of the accumulated cash deficit of the central subsystem in the months January through August of 2020.

The deficit of the general government central subsystem was HUF 2,165.0 billion at the end of July 2020 and reached HUF 2,261.3 billion at the end of August. Nevertheless, the central government debt decreased during July, as the increase in foreign currency debt due to the previous weakening of the forint exchange rate decreased from HUF 385.3 billion at the end of June to HUF 184.4 billion. At the same time, the stock of retail government securities continued to decline, by 6.1% or HUF 608.4 billion compared to the end of last year, due to the aforementioned reason.

In a statement issued on August 24, 2020, the Ministry of Finance announced that it had raised its deficit forecast: the estimated annual cash deficit of the central government general subsystem increased by HUF 1,710 billion (from HUF 1,890 billion to HUF 3,600 billion). This is nearly ten times the original deficit target and nearly twice the six-month deficit. This deficit also leaves room for further economic stimulus measures. On August 26, 2020, the Government Debt Management Agency Pte. Ltd. (ÁKK) amended its financing plan for 2020. Compared to the plan last amended in May, it increased gross issuance by HUF 1,856 billion, which is almost exclusively forint issuance. It is planned to increase the issuance of retail government securities by more than HUF 800 billion compared to the May plan. This means that, given the significant decrease in the stock

of forint bonds held by foreign investors this year, the increased deficit will be financed mainly from domestic sources.

Figure 8
Development of the accumulated cash deficit of the central subsystem in the first eight months of 2020 (HUF billion)



Source: Treasury data January-August 2020, SAO ed.

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Short-term effects of the COVID epidemic on the international and Hungarian economy

International economy

The COVID-19 pandemic health crisis has had severe consequences on the global economic activity since March this year *and has overwritten all previous forecasts.* Due to the specific character of the pandemic it is hard to make any solid prognosis for the near future. In the course of the spring months following the global lockdown forecasters hoped for a V-shaped recovery, i.e. they assumed that after a deep recession in the first half of the year a strong growth would follow in the second. However, by the end of summer, a second wave of the epidemic emerged: and although there is a slight hope that this will not lead to a general lockdown – as economic players are more prepared for adjustments – business sentiment indicators dropped affecting investment inclination as well as consumption behaviour in a negative way.

The crisis – due to the lockdown and diminishing consumer confidence – triggered a substantial drop in the demand for private consumption and services. At the same time, in certain areas – like the health sector, food products and household goods – demand grew so quickly that supply could not keep pace with it. During the pandemic, inflation remained in general moderate, reflecting the extremely low level of oil prices and dramatically shrinking demand. However, the trends show great varieties depending on sectors and regions.

The global crisis has had severe consequences on labour markets. In case of several countries short-time work schemes were introduced. The crisis affected in the first line low-skilled labour and female employees and led to a jump in unemployment rates in sectors where 'home office' was not viable and where market demand shrunk dramatically. Freelancers especially in the field of cultural services, self-employed, part-time workers, or employees on fixed terms, vulnerable groups of young workers had to face severe problems.

The experiences gained during the COVID-19 crisis drew attention to an old debate concerning *benefits of global value chains (GVCs) vs national production.* The closure of factories in China early January this year drew attention to the reliance of many manufacturing value chains on inputs from China. The idea of

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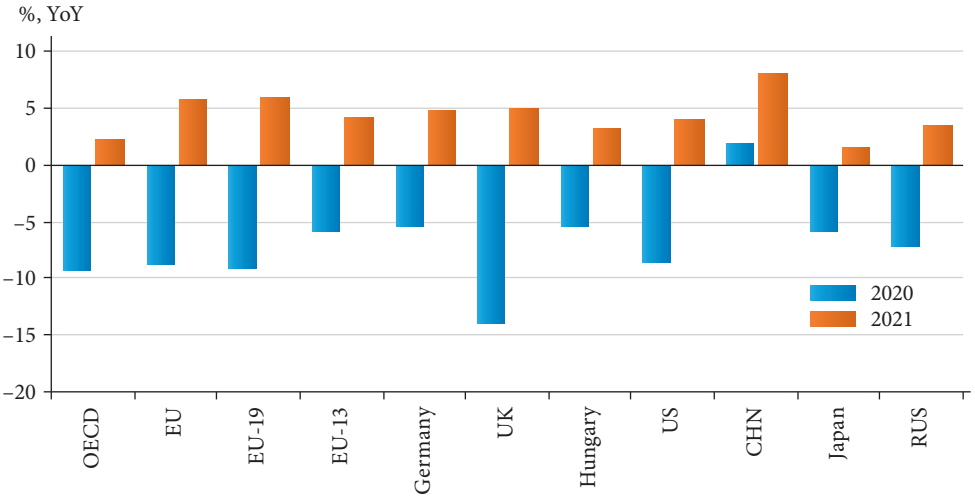
Figure 1
GDP forecasts with downward risks



Source: OECD, IMF, IfW Kiel, Kopint-Tárki.

"nationalisation" of production especially in case of strategic items emerged. It is a question whether more resilient value chains with better transparency and risk management could mitigate risks implied in internationalisation of production. It should be emphasized that the COVID-19 pandemic caused in the first place a demand-side shock which would have affected domestic value chains as well. Demand has increased dramatically for medical supplies, while there has been a significant shift in the composition of demand for food. On the other hand, demand has decreased for all other manufacturing GVCs. A rethinking of the stability of value chains will be necessary, an improved transparency and a better fore-warning system might make value chains more robust in case of similar shocks in the future. A post-crisis adjustment can generate structural adjustments (e.g. the green economy) which again would produce new types of value chains. If preference will be given to reliability and security against cost efficiency, a new approach of acquisition may evolve, supplier chains could become shorter and an increased diversification of supply sources could be strived for.

There was a sharp drop in *world trade* early 2020; especially exports from advanced countries shrunk dramatically. Commodity structure of Chinese exports changed substantially as deliveries of electronic and engineering products struggled at a low level, whilst health-care products needed for preventing contamination during the pandemic (like masks, protective clothing against contamination, sanitiser products etc.) attained a growing share. China strives to remain the most important exporter on the market of high-tech products, and she is still the biggest exporter of the world. With reshaping value chains, a relocation of production in certain sectors could be observed both in Europe and the US, however, due to capacity constraints, this remains rather the exception. Anyway, the role of China as a global player will

change in the future: its role as a supplier will weaken; however, it will play a growing role as an international investor.

Responding to the unfavourable impacts of the pandemic, *monetary easing* continued. Since the beginning of the year the *Fed* cut the base rate by 150 base points down to 0%, and most likely it will keep it at this level by the end of next year; at the same time it expanded its programme of quantitative easing. The Fed indicated that, if necessary, it will tolerate an inflation rate above the 2% target. The *ECB* expanded its asset purchase programme and continued to keep the base rate at 0%. The *Bank of England* keeps the bank rate at a historically low level of 0.1% since March 2020 and expanded the volume of quantitative easing from £645 billion to £895 billion. The *Bank of Japan* is following a policy of unlimited quantitative easing and keeping the key policy rate at –0.1%. The *Central Bank in Russia* cut the key policy rate by 25 base points to 4.25% in June and indicated that further cuts will follow.

Crisis management efforts and economic stimulus programmes lead in all countries (not only in Europe) to a substantial rise of *public debt.* As a double hit scenario is most likely everywhere, the implementation of economic stimulus measures will be continued. Thus, it is important that additional expenditures should support promising companies and contribute to the survival of competitive firms. Only this way can these measures fuel consumer and business confidence and contribute to an economic recovery. Ample liquidity and low interest rates make easier the implementation of economic stimulus programmes. However, they can generate problems in those countries where public debt was already high before the pandemic and structural problems hindered fiscal consolidation.

The major trade partners of the European Union are all suffering from the consequences of economic slowdown. In case of the *USA,* a period of several years of upturn has come to an end and for this year a GDP drop of 8.5% is expected with a moderate growth of around 2% next year. The recession in *Japan* will bring about a 5.8% fall of GDP and the maintenance of economic stimulus measures are needed to support growth in 2021. In case of *Russia,* not only the pandemic but also the consequences of the dramatically low level of oil prices are affecting the economic climate: the GDP may fall this year by almost 8% and the prospects of a recovery are weak with downward risks. The COVID-19 pandemic hit the *United Kingdom* especially hard. The economic output might fall by 10 to 14% this year and uncertainties related to the endless process of Brexit make expectations for next year also rather gloomy. Due to missing compromise and one-sided measures on behalf of the UK, the possibility of a hard Brexit is most likely. The pandemic hit *emerging countries* also hard; especially the outflow of FDI will make a recovery in these countries rather difficult.

The *European Union* will hardly be able to work off the consequences of the recession of the first half-year. In case of the EU27, there was a 14% drop of GDP in the second quarter as compared to the same period of the year before; in the euro area the decline was even higher: –14.9%. The performance of the individual countries showed great varieties: whilst in Spain the GDP shrunk by 21.5%, in Ireland the drop was only 3% in the second quarter (YoY). Losses occurred especially in manufacturing, trade, transport, and catering services. At present, risks of a worse outcome predominate:

with a second wave of the pandemic, the economic downturn may reach –8 to –9% in 2020, with a weak recovery in 2021.

In case of the euro area we reckon with a 10% drop of GDP this year but with the second hit of the pandemic ahead of us, downward risks are increasing. All components of the GDP are on decline, especially investments and exports are shrinking. In some countries – like in France, Italy, or Spain – the construction sector collapsed.

In case of the *new EU Member States* downward risks are predominating. The high indebtedness of the state and companies seems to be the biggest challenge in the coming period. This must be faced under rather disadvantageous conditions: a sluggish world economy, weaker demand in old member states, limited room for further monetary expansion and fiscal incentives. The readjustment of global value chains provides some new possibilities; however, available production capacities in these countries are limited. Next year's growth will rely in the first line on base effects, and it will take a couple of years until pandemic-caused losses can be offset.

The Hungarian economy

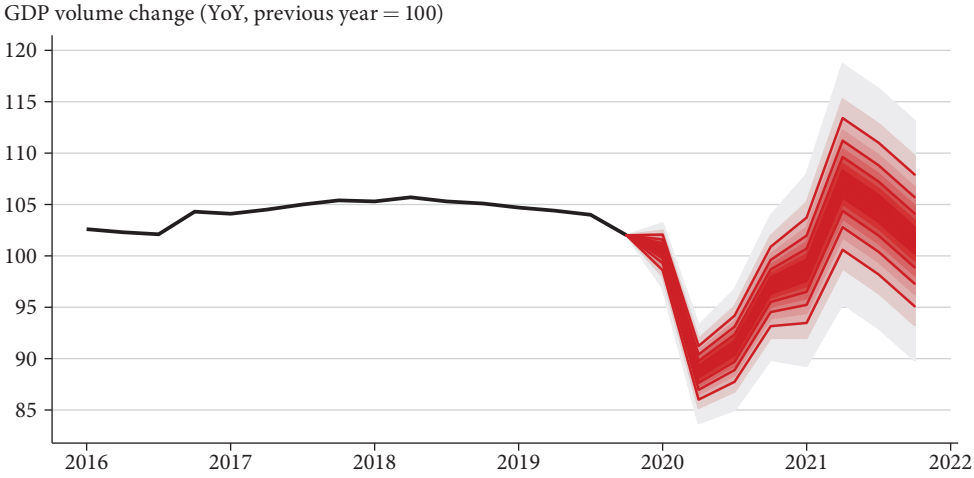
Early in April 2020, at the time of the outbreak of the crisis in Hungary, Kopint-Tárki expected the GDP to fall by 5.5% in 2020, based on the assumption that the epidemic would peter out by the end of the summer, the restrictive measures regarding free movement of persons, transport etc. would be revoked, and the last third of the year would be characterized by economic consolidation.[2] This prediction envisaged an economic contraction of 12–13% in the second quarter, which was almost entirely on par with the actual outcome (–13.6%). The prediction was not even more precise only because we did not expect that public investments would keep falling by 20% in the second quarter, a pace even worse than the contraction of business investments (by 12%). At that time, major agents of economic policy – the NBH, for example – saw revving up public investments as a crucial tool of economic stimulus but, eventually, it did not happen.

Since our April forecast proved quite on the spot until September, only a slight modification was necessary in October: we revised our growth forecast downward by 0.3 percentage points, to *–5.8%,* mostly because of the strong return of the pandemic. If the second wave becomes so severe that strict restrictions of the free movement of persons are again inevitable, the economic contraction may be steeper, however.

As for the prospects for the second half of the year, in April we predicted a 6–11% contraction of output for the third quarter and 2–5% for the fourth. But on the one hand, the initial recovery in the third quarter was more pronounced than we had expected (mostly because of a stronger household consumption, including domestic tourism). On the other hand, the fourth quarter, by contrast, will be less favorable

[2] https://www.parlament.hu/documents/126660/5181504/KT_2020_Kopint_1.pdf/4cb664e0-d27f-e7ec-d278-8c9d7d6af2b2?t=1589445250127.

Figure 2
The fan-chart of GDP forecast, April 2020



Source. CSO and Kopint-Tárki forecast, October 2020.

than previously projected, because of the arrival of the second wave of the pandemic. As a result, as of October, we predict a more moderate economic contraction in the third quarter – 5–6%, that is, the upper bound of what we estimated in April as the possible range of outcomes. In the fourth quarter, however, the rate of economic decline still may be at –5%, roughly the lower bound of our April interval of possible outcomes, or even worse.

Industrial production fell by 11% in January-August: after the 34% plunge in April-May, the pace of decline moderated to about 8% in June-July and roughly 2% in August. Just as the primary culprit behind the spring implosion was the automobile industry – in April the large automotive manufacturers completely stopped producing –, it was also the vanguard of industrial recovery. In August, the automobile industry was among the few areas that posted positive growth on an annual basis. We expect industrial output to decrease by 7–8% in 2020.

In the first eight months, the *construction* output dropped by 10.4%, and we expect an annual decrease of 8–10% for this year. *Housing construction* continued to grow through the second quarter, at least in terms of the number of dwellings built. But this shows only the completion of the projects – at the same time, the number and value of housing projects started is decreasing sharply, as many projects are deferred or even canceled amid the economic uncertainties. Looking ahead, this falling trend will eventually end, due to the recently announced temporary reintroduction of the preferential VAT rate (5%) for newly built dwellings, but that does not affect this year's performance in any way.

According to Labour Force Statistics (LFS) data, the number of *employed persons* decreased by 2.3% in the second quarter – 3% in April and May – but the downward trend moderated afterwards. In August, the rate of change was only –0.4%. The

unemployment rate peaked at 5.1% in June but decreased to 3.9% by August. The payroll statistics indicate a more drastic drop in the number of employees, and also the statistics of registered jobseekers indicate a steeper rise in unemployment than the LFS statistics. But even these alternative sources of statistical data show that the crisis-related deterioration was not as bad as expected in the spring. The annual *unemployment rate* may reach 4.5% in 2020, after 3.4% in the last year.

Gross wages rose by 10% in the first seven months of the year, which led to a 6.3% growth of real wages. It is worth noting that wage growth apparently did not slow down as a result of the COVID crisis, at least not according to the statistical data. This is partly due to the fact that employees on part-time work schemes or non-paid leave for more than one month are left out of the wage statistics. Unlike full-time wages, the number of employees (with formal employment contracts) fell sharply during the crisis, hence net *real wage disbursements* grew only minimally during January-July, and no substantial trend change is expected for the rest of the year.

Household consumption fell spectacularly, by 8.6%, in the second quarter. This is much more severe than what could be expected in the light of the official data about real wages or even real wage disbursements, which means that much of the consumption fall is due to the restrictions introduced during the summer, and also due to consumer sentiment. As the restrictions were lifted, the level of consumption got back near to pre-crisis levels quite fast in the third quarter. However, a deterioration will take place in the last quarter; due to the return of the epidemic. (The first harbingers of this negative turn can already be seen in the data on retail-trade turnover and the restaurant sector in September.) For the year as a whole, we expect private consumption to *decrease by slightly more than 3%*.

Investments fell by 9.9% in the second quarter, resulting in an average decrease of 6.3% in the first half of the year. Part of the decrease is due to the closing of various EU-financed investment projects, which caused a near-20% drop in public investments. On the other hand, the loss of revenues and mounting uncertainties reduced firms' ability and intent to invest. The pace of fall will ease in the third quarter, but on a yearly average, investments are to contract by *about 6%* in 2020.

The *net export of goods* plummeted by 18% in the first eight months, mostly due to the precipitous fall of export in April. In June-August, the turnover of external trade recovered to a large extent, and sizeable monthly trade surpluses returned. But even if the trade balance do not worsen from autumn, the yearly trade surplus may dip below EUR 4 billion in 2020 from the EUR 4.3 billion last year.

By now it is without a doubt that Hungary's *fiscal position* will deteriorate in 2020 – along with the overall economic performance to a degree not seen for a long time. In the short run, this is warranted, as necessary anticyclical policy, but in the longer term, the deterioration will make a serious fiscal consolidation unavoidable.

The defensive measures against the epidemic and the economic recession together led to a 10–13% drop in tax revenues during the spring, but in the summer the year-on-year decrease changed into stagnation. On the whole, revenues fell short of the target by HUF 700–800 billion during the first eight months due to the recession alone, and the cost of anti-cyclical and defensive government measures – suspension

of tax payment obligations, wage subsidies, state purchases – was of a similar order of magnitude.

While the loss of revenue due to the recession may reach 3.2% of GDP at an annual level, an additional cost of 2.4% comes from the government measures announced so far. But the liquidity support from the EU, amounting to 0.6% of GDP, can be used for the government measures mentioned above, reducing their overall cost to 1.8% of GDP. Based on this calculation, a deficit of 6% of GDP is most likely, instead of the original fiscal target (1%). But the minister of finance has recently predicted a deficit of 7–9%. We do not yet know the reason behind this pessimistic prediction – it could be a stimulus package, or some other kind of fiscal expenditure, that has not been announced so far.

Due to the recession and the large deficit, the *government debt* will reach 75.3% of GDP by the end of the year, from the 66.3% in end-2019.

In the first eight months, the Hungarian *inflation rate* was the highest among EU member states. Clearly, the very high price indices of food products and alcoholic and tobacco products were the most important factors: food prices were up by 7.8%, alcoholic and tobacco product prices rose by 7% during January-August. In addition, the price hike in summer was partially caused by the weakening of the forint and the surge of demand in the post-lockdown period. We expect food prices to continue to have an inflationary impact for the rest of the year. On the other hand, the softening of demand in the wake of the second wave of the epidemic may have a moderating effect on the price index.

We revise our April inflation forecast for 2020 from 3.8 to *3.5%* in October. On the other hand, if the substantial shift in the composition of consumer basket is taken into account, and the inflation rate is calculated accordingly, the actual price hike in 2020 may exceed 4%.

PETER HALMAI[1]

Structural characteristics of economic growth in the European Union

Executive summary

1. The recent financial and economic crisis has had a lasting and severe impact on European growth processes and growth potential. After the double-dip recession, a slow and differentiated recovery has taken place. Some EU member states are experiencing persistent growth problems. The downward trend in potential growth is particularly significant. Exploring the deeper mechanisms of the latter can also provide important additions to European and national reform processes. Our subject to be examined is also extremely important for European public finances. The recent expansion of the global COVID-19 crisis can also put the discussed topics in a perspective.

Keeping the abovementioned topics in mind, the *main objectives* of the research were the following: examine the potential growth characteristics of recent years using growth accounting methods on the one hand; explore the main factors of the medium- and long-term development of the growth potential, and identify the possible reforms that can strengthen the growth capacity, on the other hand.

2. Actual growth reflects business cycles (among others). However, actual growth cannot be permanently detached from *potential growth*. The structurally sustainable performance of the economy, the *balance level of output* is expressed by the potential output, and its *sustainable dynamics* by the growth potential. Since statistics include actual growth data, exploring potential growth requires complex quantitative analyses.

The application of growth accounting and the production function approach may provide an opportunity to calculate potential growth. The latter focuses on the supply side of the economy, the quantity and quality of labour, the accumulation of capital, and total factor productivity as the main drivers of output. The aim is to identify the effect of these driving forces, to decompose the growth rate according to their effects. In the system of the production functions, potential growth can be calculated on the basis of labour and capital inputs and the development of total factor productivity (TFP).

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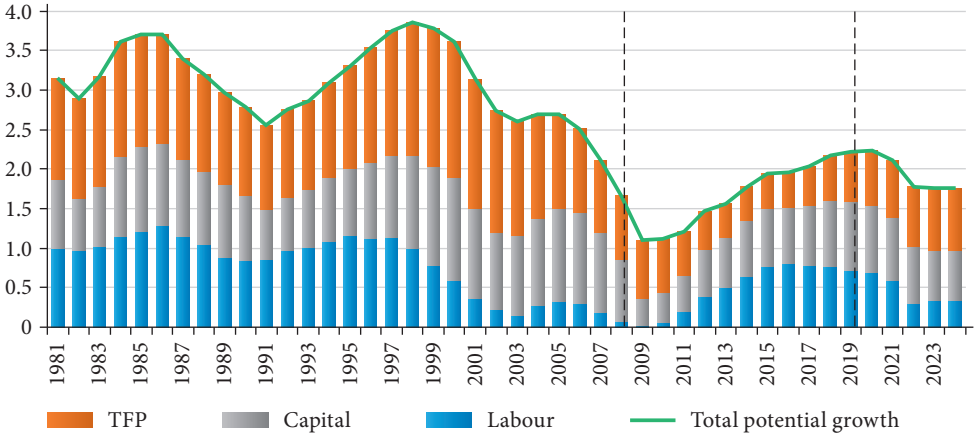
This analysis (which is internationally also unique) was focusing on the financial and economic ("big") crisis of 2008–2009 and the subsequent recovery prior to the current period. *Two main dimensions* were reviewed: based on longer data sets, the "old" (pre-2004) *EU15* on the one hand and, on the other hand, after the enlargements in 2004–2007, the potential growth processes and models of the *EU27, including certain relevant groups of countries*. Exploring all this can provide a basis for a comprehensive study of the effects of the COVID-19 crisis on growth potential, in addition to summarizing it so far. *In fact, both recessions are "big crises" and the COVID-19 crisis will pose a larger downturn than the previous crises.*

3. *The likelihood of lasting effects on potential growth* after "major crises" is much higher than in previous recessions. According to simulations based on the production function method, these factors lead to *a decrease in the potential growth rate in the European Union member states in the medium and long term, in addition to the initial effects*. But through their cleansing effect, forcing structural transformation and the reallocation of resources, they can also provide new chances, a new opportunity, for the growth of total factor productivity.

4. *In the EU15*, significant differences can be revealed between the groups of countries examined and the main features of each growth model.

The potential growth rate of the EU15 has been steadily declining since 2000. This decrease can be explained by the development of labour productivity. (The contribution of the labour factor was positive throughout 1985–2008.) The growth rate of labour productivity has been steadily declining since 1993. As the contribution of the capital factor to potential growth did not decline significantly until 2009 (fluctuating between 0.7 and 0.9% of GDP per year throughout), *the structural factor in the decline of labour productivity was the unfavourable development of total factor productivity.* (Its yearly contribution fell too, roughly by two thirds in three decades.) The EU15 growth model is summarized in Figure 1.)

Figure 1
The EU15 growth model (Development of potential growth and its factors)



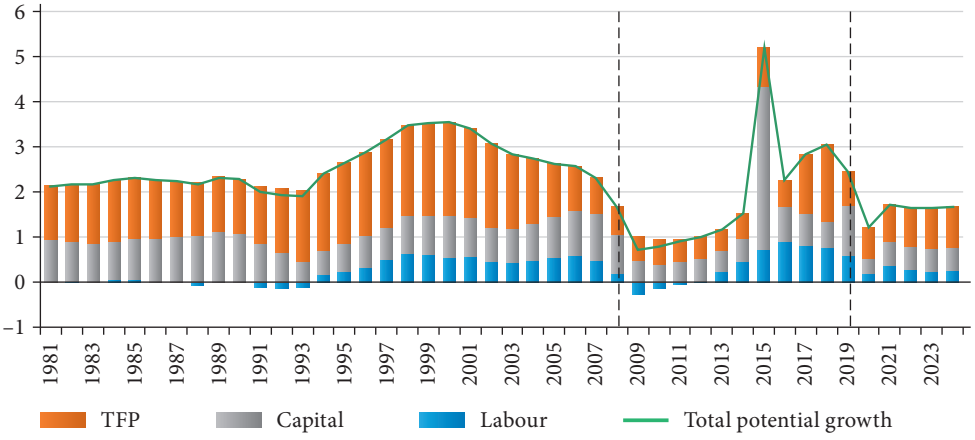
Source: Eurostat, own calculations.

The growth model mentioned above also characterizes the founding member states, A6. (For the classification of countries see the Appendix.)

The trends of the latter-joined, developed Member States (U6) are different from the former. For U6, the highest potential growth rate was during 1997–2002 (above 3% per year!). It then started to decline: to 2.1% by 2007 and below 1% per year during the big crisis (2009–2012). However, during the strengthening recovery in 2015–2019, the potential growth rate was already between 1.8–2.9% per year (the latter is more than one and a half times higher than the EU15 average). The decisive factor for potential growth was labour productivity growth, between 2–3% of the annual GDP. Of which the effect of the capital factor during 1985–1991 and 1997–2008 was between 0.7 and 1%. Thus the determining factor was the development of *TFP. The latter's contribution has basically increased in line with the growth dynamics of the United States* or, in some periods, even exceeded it. At the same time, the dynamics of TFP – largely related to the British productivity paradox – started to decline at an accelerating pace from the early 2000s. This trend was partly offset by the temporarily increasing impact of capital accumulation and the increasing contribution of the labour factor following labour market reforms. During the crisis, the contribution of capital and TFP declined significantly. During the recovery, the dynamics of labour productivity increased again: from 2015, the contribution of capital to potential GDP growth was 0.6% per year, and that of TFP was 0.5–1.0%. As a result of all this, during 2015–2019 the annual potential growth rate in the U6 countries was again between 1.8–2.9%.

As a result of the British productivity paradox, the U5 group of countries, calculated without the UK after 2007, is characterized by even higher productivity performance. The recovery from the great crisis needs to be highlighted: from 2015, the potential growth rate was 2.3–3% per year (and in 2015 it was exceptional, above 5%). The determining factor in this dynamic was the growth of productivity. The annual contribution of the capital factor was 0.6–0.7% and that of TFP 0.6–1.7%. Thus, U5 – essentially the only one among the examined groups of countries – has largely reached its pre-crisis dynamics (Figure 2).

Figure 2
Growth of U5 countries (Development of potential growth and its factors)



Source: Eurostat, own calculations.

In terms of potential growth, the recent financial and economic crisis has led to a *structural break* in the Mediterranean or M3 countries that joined in the 1980s. After a significant slowdown, the rate of potential growth in 2011–2014 was decreasing, and exceeded 1% per year only between 2010 and 2018. Between 2009 and 2016, the effect of the labour factor was negative. The great crisis, including the sovereign debt crisis, which affected this group of countries particularly strongly, resulted in a significant increase in the cost of capital and a narrowing of opportunities for capital accumulation. Between 2011 and 2014, in the M3, TFP did not contribute to potential growth either. (The latter has been only 0.3–0.5% per year since 2016.) Among all the groups of countries examined, labour productivity development was least favourable in M3.

4. *The potential growth rate in the United States exceeded the EU15 average in each year of the period under review.* At the beginning of the big crisis, the growth rate of potential output fell sharply. (The contribution of labour, capital accumulation, and TFP declined significantly.) By 2017–2019, the potential growth rate of 2007 was essentially restored. At the same time, the productivity growth rate was only 60–70% (compared to the value above 90% in the period 2002–2007).

The US growth model reviewed over the four-decade period has resulted in higher growth dynamics than the EU15 average. No *catching-up potential* was detected concerning the EU15 average during the period under review. The same applies to A6 countries. Since the beginning of the big crisis, the M3 countries seem to have been left behind, so to speak, in an unstoppable way from groups of countries with higher dynamism. But *in the U6 (and U5) countries, potential growth has been broadly in line with the United States, and even more dynamic in some periods*. The determining factor of U6 (U5) growth performance is the continuous dynamics of labour productivity and, among its determinants, total factor productivity. Until 2006, the share of the latter's contribution to potential growth exceeded that of the United States (and it has been exceeding it again since 2015.)

The US economy did not escape the slowdown either. At the same time, the currently projected demographic, TFP, investment and productivity trends in the United States are significantly better than the EU15 and euro area member states' averages. In the case of the United States, the pre-crisis dynamics of growth potential has largely recovered, while on the average of the European countries examined, assuming unchanged policies, it has been halved.

5. *In the new Member States that joined in 2004–2007 (EU12), the financial crisis led to a sharp decline in potential growth rates:* from 4.8–4.9% in 2004–2007 to 2.4% in 2009 and 1.7–1.8% in 2010–2013, to the third of the previous dynamics. From 2014, the recovery gained momentum. Between 2015 and 2019, the potential growth rate increased to 2.9–3.1% per year on average in the country group. Between 2009 and 2013, the contribution of labour was negative. The investment rate fell from 28.2% in 2008 to 20.9% in 2012. The contribution of the capital factor to potential growth has decreased significantly. At the same time, at the beginning of the crisis, the dynamics of TFP declined from 2–3% per year in 1999–2007 to less than 1%. Between 2015 and 2019, the potential growth rate of the *EU12* increased

to 2.9–3.1% per year on average in the group of countries. This dynamics is 60% of the pre-crisis rate. The decline in the contribution of the capital factor is the most significant, but the dynamics of total factor productivity also lags far behind the pre-crisis period (1.6–1.8% per annum from 2016).

The *sovereign debt crisis* played a significant role in the unfavourable medium-term outlook for the EU15, affecting mainly (even to this day) the southern EU Member States. The potential growth rate of the "developed" Member States of the EU15 in 2015–2019 was around 1.5–2% per annum, which is close to the pre-crisis dynamics. However, there are significant differences across countries. The typical trend in this regard is *divergence*.

The rate of potential growth in the *EU27* was steadily declining until 2012, being 1.3–1.6% in 2015–2019. *This dynamics is just half of that a decade and a half earlier.* The decisive factor is the unfavourable development of productivity. The contribution of capital and total factor productivity from the depressed 2009–2010 levels did not recover but remained persistently low (reaching roughly half of the previous contribution). And labour market trends are also unfavourable – mainly due to a significant slowdown in the growth rate of the working-age population. At the same time, *these growth prospects pose new challenges for real convergence.*

The cumulative effects of all these factors are significant. In the case of the EU15, based on the potential growth rate of the pre-crisis period of 2000–2007, potential growth between 2008 and 2018 reached a much more modest level. *Due to the lower dynamics, the potential output of the EU27 in 2018 was about 17.3% lower than the previous growth rate.* (This effect is 16.9% for EU15 and 27.1% in case of the EU12 group.)

6. The financial crisis has affected different Member States to varying degrees. *The symmetric shock had asymmetric consequences.*

The intensity of the impact of the financial crisis in each EU country depends on the *initial circumstances* and the *vulnerabilities* associated with it. The overvaluation of residential real estate markets can play a significant role; as can the export dependence of the economy, the balance of payments position; the size of the financial sector and the exposure to risky assets. In relation to these factors, the rate of potential growth, the investment rate, the development of structural unemployment (NAWRU) etc. vary considerably from one member state to another.

In the quantitative analysis, *the EU27* countries were classified into *five groups* based on four main economic and policy characteristics. Three of these groups include countries that are on the path to organic market economy development: the "Continental", "Reform" and "Mediterranean" member states include the former EU15 and the two Mediterranean island states that joined in 2004. The new member states in Central and Eastern Europe are in the "Catching up" and "Vulnerable" groups.

Based on the analysis of the medium-term potential growth processes of each country group, the following *main conclusions* can be drawn:

Each of the examined groups shows significantly *different trends* in terms of potential growth. While the more developed member states mostly reach or exceed the EU27 average growth rate, the "Mediterranean" countries are lagging

far behind due to their structural difficulties, including their sovereign debt crisis. (Their potential output has been steadily declining between 2011 and 2015.) The potential growth rate of less developed member states has slowed significantly. *As a result, the growth dynamics of each group of countries*, but for the "Mediterranean" group*, are converging somewhat*. (But the same could not have been achieved in terms of the level of potential output.) That is, relative and *surprising convergence can occur in the potential growth rates of groups of countries with fundamentally different situations.*

The decisive factor for growth potential is an increase in *labour productivity*. But *its dynamics fell to unprecedented levels during the crisis*. During the recovery, productivity developed in a highly differentiated way. The highest dynamics are in the "Catching up" and "Vulnerable" groups and the "Reform" group as well, while the lowest are in the "Mediterranean" member states. The latter are also surpassed by "Continental" countries.

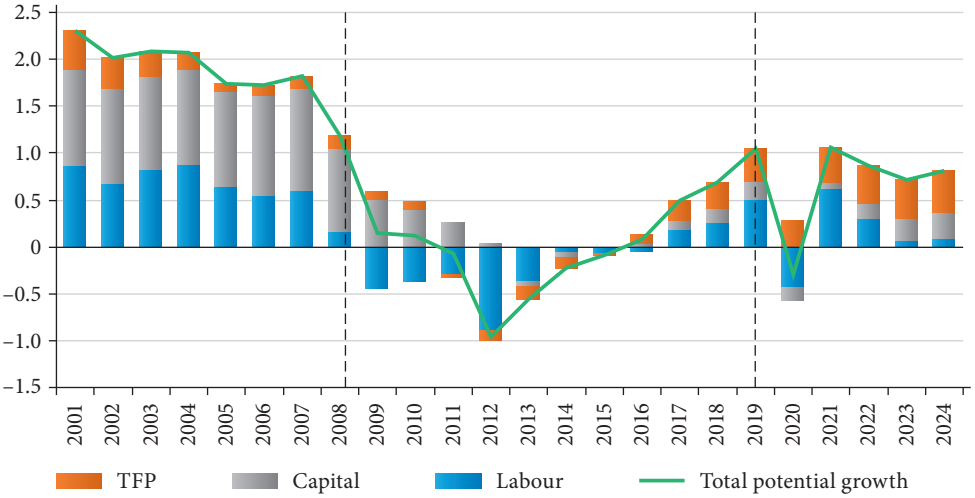
The contribution of each factor to potential growth is very different. The share of investments in the case of "Continental" and "Reform" groups recovered to pre-crisis high levels during the period 2017–2019. It is 3% lower in the "Catching up" group and about 6% lower in the "Mediterranean" countries and in the "Vulnerable" group, compared to the sometimes extremely high rate a decade ago. The contribution of the labour factor has increased the most in the "Reform" group since 2009 but has declined for many years in the "Mediterranean" and "Vulnerable" Member States.

The contribution of the capital factor to potential growth in the "Mediterranean" countries has almost completely disappeared since 2012, but has decreased in all groups examined, with the exception of the "Reform" countries. In the new member states, keeping in mind the context of extremely high previous levels, this decline was stronger. Total factor productivity, as a structural determinant of potential growth, is moving away from the low point of the crisis, but overall remains at a lower level than in the pre-crisis period. The most unfavourable dynamics of this structural component can be seen in the case of the "Mediterranean" group of countries. At the same time, *"Reform" countries are broadly approaching pre-crisis TFP dynamics.*

The *most unfavourable trends* in terms of potential growth and the contribution of each factor can be seen in *the "Mediterranean" countries* (Figure 3). Regarding the average of the "Mediterranean" group of countries, *catching up stops* in the period under review.

7. *The US growth potential generally exceeds the dynamics not only of the EU15 but also of the EU27.* At the same time, the EU27 includes highly differentiated growth performances. The increase in catching-up was in line with the potential output levels of the United States – to varying extent in time – in the "Reform" countries and in the average of the groups of the new member states. At the same time, the "Mediterranean" group and, to a lesser extent, the "Continental" group moved away from the US performance in the years after the big crisis. The United States also exceeds the average of the EU member states in terms of the impact of the labour factor and labour productivity, mainly of the "Mediterranean" and

Figure 3
Growth model ("Mediterranean" – M6 countries) (Development of potential growth and its factors)



Source: Eurostat, own calculations.

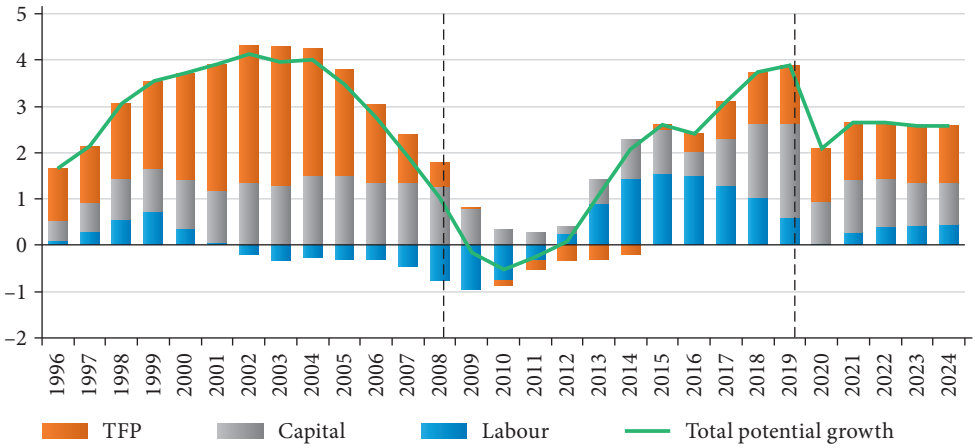
partly the of "Continental" group of countries. *Thus, catching-up growth has ceased on average in the enlarged European Union since the crisis, signalling the depletion of the European growth model.*

8. *The Hungarian growth potential had started to decrease even before the crisis, after the EU accession, and halved by today.* After the onset of the crisis, it continued to decline and then *virtually disappeared for three years*. Its dynamics only reached 1% per year in 2013. Between 2017 and 2019 it rose above 3% per year, roughly reaching pre-2006 dynamics. The labour factor not contribute at all to potential growth in Hungary during 2001–2011. However, since 2012, it has been making a positive contribution. For 2014–2016, this effect is particularly high, reaching 1.4–1.6% per year. At the same time, the temporarily increased NAWRU decreased in relation to the previous period: from 10% in 2010 to an unprecedentedly low level (4.6–5.1%) in the period 2017–2019. At the same time, the participation rate increased from 56.7% before the big crisis to 64.6%.

Between 2010 and 2012 *the impact of the capital factor* decreased from its pre-crisis level of 1.4% to 0.2–0.3% then it increased again. The *investment rate* fell from a pre-crisis rate of 23% to 18.4% in 2012 and then rose again. In 2018–2019, parallel with the strong expansion of funds received from the EU, it increased to an unprecedented high rate (25.5–28.3%). *Total factor productivity* fell from its 3%-a-year level to 1% even before the crisis, and it was negative between 2011 and 2014. It rose to 0.7% in 2017 and 1.1–1.3% in 2018–2019. (The main features of the Hungarian growth model are summarized in Figure 4.)

Based on the above, the essential *factors of the Hungarian growth capacity and its dynamics* can be summarized as follows:

Figure 4
The Hungarian growth model (Development of potential growth and its factors)



Source: Eurostat, own calculations.

- potential growth, especially in the period 2008–2013, has *de facto* disappeared, the revival of growth potential has become a basic economic policy task;
- as the output gap in 2009–2014 was negative, the dynamics of actual growth may have been temporarily higher than the rate of potential growth;
- the central factor of the recovery of the growth potential between 2012–2016 was the increasing use of the labour factor, then, from 2015, the contribution of the capital factor became more and more decisive, i.e. the extensive factors of growth dominated, the possibilities of further increasing these factors were limited;
- *total factor productivity* has not contributed to potential growth for many years, its impact has only increased in the most recent years;
- among the sources of potential growth, *productivity* has exceeded the impact of the labour factor only since 2017;
- a sustainable, dynamic growth path can only be established through *profound structural reforms* that permanently increase the rate of potential growth.

9. A lasting source of potential growth in EU member states could be the *increased productivity*. In the 21st century opportunities for growth potential based mainly on extensive factors are extremely limited. Central to this is its structural factor, the dynamics of *total factor productivity*. The level and dynamics of performance in this area varies greatly from one member state to another. Reducing performance gaps at the forefront, through profound structural reforms, is a key factor in strengthening growth potential.

At the same time, "big crises" can have a cleansing effect, freeing up resources for more efficient activities. Rapid reallocation of resources can mitigate losses of growth potential. Rapid structural transformation can be facilitated by integration into global and continental value chains. Disruptions in redeployment can lead to deteriorating

resource usage and rising unemployment. Efficiency-based reallocation of resources can also open up new opportunities for TFP growth.

Exploring potential growth and growth potential is an essential condition for defining and applying the right policies (policy mix). These projections for potential growth assume unchanged policies. Adverse trends – in principle – can be offset, or at least mitigated, through substantial changes in macroeconomic policies and the implementation of in-depth structural reforms. Analysis of the determinants of growth potential can help establishing the foundations for unavoidable structural reforms and macroeconomic adjustments.

Appendix

Categories of the EU15 member states in this article are the following:

- The founding member states (A6) are the countries that established the European Economic Community (EC) in 1958: DE, BE, FR, IT, LU, NL. They represent the "Continental" European model.
- "New" member states (U6) are those developed countries that joined the European Communities or the European Union in 1973 or 1995: IE and UK representing the "Anglo-Saxon" model, DK, FI and SE representing the "Scandinavian" model, and AT. U5 is the U6 minus the UK.
- "Mediterranean" member states (M3) comprise EL that accessed in 1981 plus ES and PT from the Iberian Peninsula that joined the EC in 1986. These three countries represent the "Mediterranean" model.

Categories of the EU27 member states:

- "Continental" countries: BE, DE, FR, LU
- "Reform" countries: AT, DK, FI, IE, NL, SE (UK)
- "Mediterranean" countries: CY, EL, ES, IT, MT, PT
- "Catching up" countries: CZ, PL, SI, SK
- "Vulnerable countries: BG, CR, EE, LT, LV, HU, RO

MAGDOLNA CSATH[1]

The emergence of sustainability and socio-economic development in competitiveness in Hungary

Executive Summary

In contrast to the more well-known approaches, which focus on the relationship between the economic and environmental sustainability, this study focused on the sustainability of the economy itself through its relationship to competitiveness, in terms of its structure, knowledge content and knowledge base. Accordingly, it examined:

- A professional interpretation of sustainability and sustainable competitiveness in the light of the international literature and noted that there is no uniformly agreed definition of said concepts. This justifies a country taking its own interpretation of the two concepts, taking into account its own circumstances, strengths and weaknesses, as well as its opportunities and threats.
- However, the definition should be based on the premise that the examination of sustainability requires a systemic approach, taking into account the interrelationships between the various areas of sustainability.
- A key issue in the context of economic sustainability and competitiveness is the approach and orientation of how to improve competitiveness, given the cost-based and non-cost-based interpretations of competitiveness.
- This raises the controversial issue of the interpretation of getting into the "middle income trap" and how to measure said situation more objectively than the GDP per capita indicator, given the obvious sustainability weaknesses of the GDP indicator.

In line with the aforementioned, the study analyzed the emergence of sustainability in international competitiveness research and found that although there are attempts to examine competitiveness and sustainable competitiveness together, as the methods used blur the indicators of the two areas, additionally to the competitiveness rankings based primarily on business considerations the sustainability competitiveness rankings do not appear separately, despite previous attempts for doing so. This also points to the problem that, in fact, international analyses do not differentiate between

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positions achieved on the basis of national and business level indicators. The composite indicator used blurs the various factors. This means that

- it is difficult to draw general economic policy conclusions from the reported rankings. It is almost impossible to draw conclusions related to economic policy that also focus on sustainability considerations. Therefore
- there is a need for national rankings that take into account local socio-economic conditions, in particular specific strengths and weaknesses,
- instead of composite indicators, the most important indicators of economic and competitiveness sustainability (structure of economy, proportion of innovative companies, proportion of knowledge-based activities and jobs, etc.) should be examined separately to look for ways to raise the given levels, which at the same time ensure social sustainability without negative impacts (negative externalities) on natural resources as well.

Consequently, in the case of Hungary as well, the analysis and improvement of the current sustainability situation and the integration of sustainability aspects into competitiveness analyses require an approach and professional point of view that starts from local conditions, but naturally takes into account the UN and EU sustainability goals as well. In the case of Hungary, according to the findings of the study, this may indicate the following tasks:

- In order to ensure sustainable competitiveness and, in this context, sustainable development, as the analysis of the study shows, the emphasis should be on ensuring economic and social sustainability, taking into account environmental impacts, as well as negative economic externalities.
- In addition to the GDP indicator, it is essential to regularly analyze the key indicators of economic and social sustainability and aim at improving their values, which also means not accepting economic policy goals and solutions that have negative human, social or ecological consequences in the long run.
- This would require the quantification of the various elements of national wealth, including human wealth (quantitative and qualitative characteristics of the population, patents, scientific results, etc.) and natural wealth (land, water, forest, air, natural resources, etc.), and, thereafter, current data on the development of their value should be regularly calculated in order to compare the expected economic effects of economic decisions (building and machinery investments, road construction, airport expansion, etc.) with their possible longer-term impacts (improving or deteriorating) on human and natural wealth.

An important aspect of sustainability is also the smart adaptation to the rapidly changing economic and market environment, which requires the continuous modernization of the economic structure and the creation of new knowledge helpful to this process. Hungarian data need to be improved in both areas, which can be achieved by the following actions:

– *In the field of modernizing the economic structure:*

- increasing the share of local new value added by strengthening the role of modern industries,
- knowledge creation instead of knowledge import, local knowledge utilization,
- reducing the seemingly disproportionate overweight of large companies,
- offsetting the predominance of specific sectors,
- enhancing the innovation of the small business sector,
- encouraging the start-up of new companies,
- reduction of significant regional differences, reducing the central role of Budapest.

– *However, the modernization of the economic structure is inconceivable without a significant rise in the level of knowledge, which requires knowledge capital investments, especially in the following areas:*

- generalization of adult education,
- making retraining and further training within companies a general practice,
- a significant increase in the proportion of people with tertiary education,
- increasing the proportion of people pursuing higher and doctoral studies in fields of STEM,
- a significant reduction in the drop-out rate,
- speeding up social mobility and improving the chances of breaking out of poverty by increasing knowledge,
- making the social environment, the business "atmosphere" friendly to business and innovation,
- in order to avoid the middle-income trap, it is important to identify and describe objectively the interconnectedness of the specific threats which characterize the Hungarian situation and formulate a proposal for specific remedial steps.

The economic and human/knowledge sustainability systems of sustainable competitiveness and sustainable development are closely interlinked, while being located in a particular social sustainability pattern. The social pattern itself is a sustainability phenomenon on which

- in addition to the changes of the number of population, the length of life expectancy and the quality of life
- social cohesion, strength of social trust, level of corruption, prevailing values (performance- or relationship-oriented culture, appropriate proportion of bottom-up and top-down initiatives, i.e. the size of the power distance, legal certainty, openness, degree of future-orientation) also have a significant impact.

In our time, a multitude of researches and textbooks prove the growing importance of these difficult-to-grasp and difficult-to-quantify, so-called soft indicators. For example, the persistently good competitive position and innovation performance of

the Scandinavian countries can be attributed to the "gold of the North", according to analyses. And that is the strong level of trust and social cohesion. In this respect, Hungary is performing poorly in all international analyses.

In the case of Hungary, it is therefore extremely important for sustainable competitiveness and development to think not only in technological modernization and machinery investments, but also to focus strongly on those soft areas of competitiveness and sustainability in which we are in a weak position. This is also a condition for avoiding to fall into the middle income trap.

* * *

Summarizing the ideas, achieving a sustainable economic and competitive situation would require measurements and a sustainability strategy that would improve the situation. In the case of measurements, the correlations between economic performance and its effects on other elements of national wealth should be sought. The sustainability strategy should include goals, actions and their timing on how to put Hungary on an economic, social and environmental sustainability path that protects natural wealth and strengthens human wealth based on a modern economic structure.

ISTVÁN KÓNYA[1]

The role of small and medium-sized enterprises in the Hungarian economy

The aim of the study is to understand how the domestic SME sector fits into the national economy and to predict how shocks to the sector affect economic performance and the budget. To this end, we have built a simple, two-sector macroeconomic model, where in one sector there are typically multinational companies owned by foreigners, and in the other there are SMEs that partly produce for the domestic market and partly supply multinationals.

The parameters of the model were quantified with some key statistics on the corporate structure of the Hungarian economy, such as the ratio of the SME sector to employees and added value and the main sectoral relations between them and the multinational companies. Using the quantified model, we examined the development of the competitiveness of the national economy and the SME sector in the event of various shocks and economic policy interventions.

The performance of the SME sector is a key factor for the Hungarian economy. Recently, a thorough study has been published,[2] analyzing the distribution and dynamics of Hungarian corporate productivity, with special regard to the duality present in the economy. While that study uses corporate data and primarily presents empirical facts, in this analysis we present a model-based, macroeconomic approach. The main advantage of model-based research is that we can study the effects of various economic policies and other changes.

Basic assumptions of the model

The macroeconomic model uses the well-known and widely used Melitz approach,[3] where the main feature is that the productivity of the companies included is heterogeneous. This is a significant step forward from the traditional, representative

[1] Institute of Economics, Centre for Economic and Regional Research.

[2] Bisztray, M., Muraközy, B. and Reizer, B. (2019). Productivity differences in Hungary and mechanisms of TFP growth slowdown. European Commission.

[3] Melitz, M.J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. Econometrica, 71: 1695-1725.

companies-based macroeconomic approach. On the one hand, we can explain the significant differences in size and productivity visible in corporate data within a given sector. On the other hand, the model framework endogenously predicts the number and size of firms involved in production, and the distribution of their productivity. Consequently, in Melitz's approach, we can quantify not only the part of industry adaptation within a given firm ("intensive frontier") but also the part that goes through exit and entry ("extensive frontier").

To examine the role of the Hungarian economy and the SME sector in it, we make the following assumptions. Production and sales take place in two sectors, the foreign-owned large enterprise ("multi") and the domestically owned medium and small enterprise ("SME") sectors. Multis supply the international and domestic consumer markets, while SMEs produce also partly for the domestic consumer market and, partly, are suppliers of multinationals. Some of the intermediate products used by multinationals come from the SME sector and some from imports. As a result, domestic suppliers compete directly with imported (intermediate) products.

SME companies are heterogeneous and differ in productivity according to the Melitz approach. Whether an SME can successfully enter the domestic or supplier market depends on its productivity. We present the consumer side in the simplest possible way. Domestic demand comes from labour income and is split between products from the multi and SME sectors. In the model, we also take into account two important elements of taxation: companies pay income tax and households pay consumption tax, the properties of which being the same as VAT in the model.

The main assumptions of the model were motivated by some main features of the Hungarian corporate structure. There are far fewer foreign-owned companies, but their average size is much larger, both in terms of turnover and number of employees. The average number of employees of a typical domestically owned company is 3–4 people, and its annual turnover is approx. 240 thousand euros. These indicators are approx. 40 people and 8–9 million euros per year for foreign owned companies. Thus, domestic companies are typically small and medium-sized companies, while foreign-owned companies are medium-sized and large companies. Thus, the SME sector consists mainly of domestic companies, as we assume in the model.

The role of foreign-owned companies in foreign trade is also crucial. Foreign-owned companies provide the lion's share of the import and export of a product and service. In 2017, the share of foreign-owned companies in product exports was 86%, in service exports 80%, in product imports 82%, and in service imports 83%. Thus, the assumptions of the model that foreign trade takes place through the multinational companies and that domestically owned companies are mainly concentrated in the SME sector are basically in line with the Hungarian data.

Model simulations

Using the model, we present four scenarios as simulations to examine the weight and economic role of the SME sector.

1. The productivity of the Hungarian small and medium-sized enterprise sector increases.
2. To become a supplier the entry barrier lessens in the SME sector.
3. The corporate income tax rate in the SME sector decreases substantially – by 30%.
4. Imports of intermediate products become more expensive. This scenario is suitable for examining the effects of the recent shortening of global value chains that can be explained by various reasons.

The scenarios were chosen to capture different aspects of the competitiveness of the SME sector. Productivity growth is the most obvious and lasting way to improve competitiveness, but at the same time the least easily influenced by economic policy. With the second and third simulations, we capture the reduction of the administrative and financial burdens of starting a business. Finally, in the fourth option, we examine the effects of shortening supply chains, which is an exogenous but important factor for the Hungarian economy.

The results for the different simulations are presented in four panels, highlighting a total of 12 variables. The first panel shows the characteristics of the suppliers; in the second, nominal GDP, consumption and export volumes; in the third, the consumer price index and wages; and the fourth shows the development of tax revenues. For most variables, the percentage change from baseline is shown in the figures. The exceptions are the share of suppliers within the SME sector and the share of suppliers within the input expenditures of multinational companies: since these variables are already measured as a percentage, of the figures show the percentage change.

SME productivity

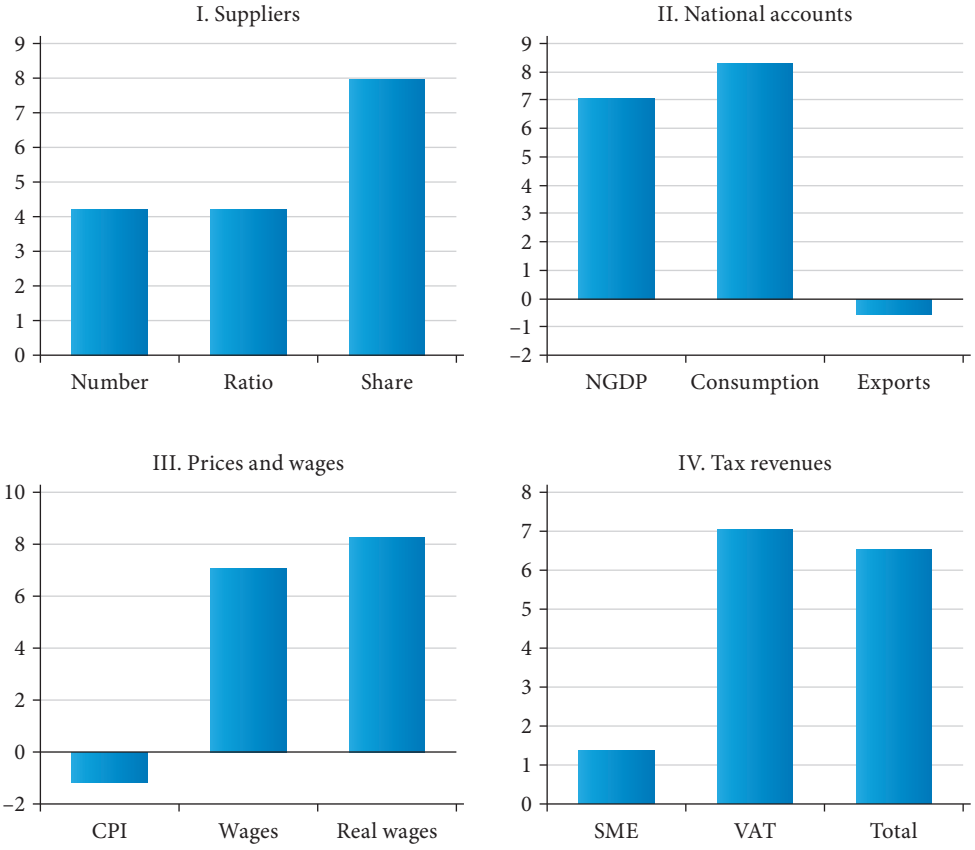
One of the key conditions for Hungary's further convergence is the increase in the productivity of Hungarian small and medium-sized enterprises. In the first simulation, we examine the consequences of an average 10% productivity increase in the SME sector.

The first panel shows the evolution of supplier statistics. The number of suppliers' increases by 4%, i.e. more companies are able to sell to the multinational sector. Within all SMEs, the share of suppliers also increases by 4%. The competitiveness of the SME sector also increases compared to imports, and the share of domestic suppliers in the purchases of multinational companies would be eight percentage points higher.

The impact of SME productivity growth is also strong at the national level. Nominal GDP grows by 7%, while consumption rises a bit higher, at a rate of just over 8%. Interestingly, (multinational) exports decline minimally. The reason for this is that with the growth of domestic demand, the domestic sales of the multi sector will also increase, to the detriment of exports.

The third panel shows that nominal wages rise by 7% and real wages rise to a greater extent, just above 8%. This is because the consumer price index decreases. Thus, SME

Figure 1
Consequences of SME productivity increase



productivity growth is reflected to a greater extent in rising wages and to a lesser extent in declining average prices.

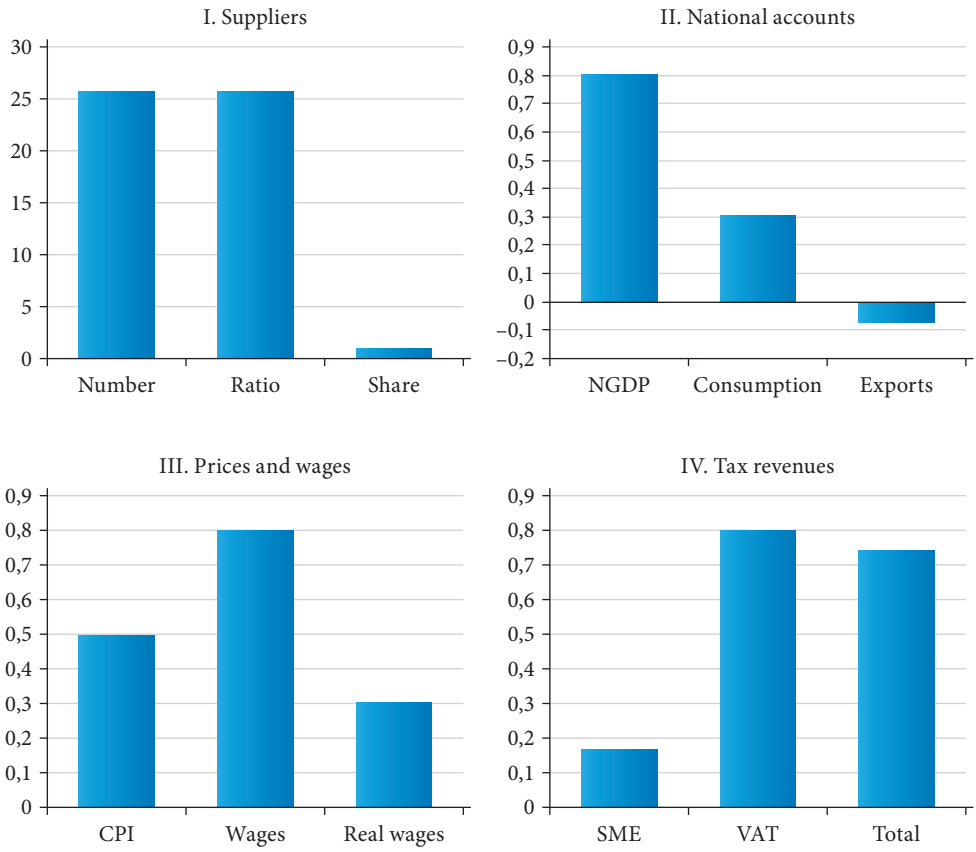
Tax revenues increase as economic performance increases. VAT revenues increase the most, while the profit tax paid by the SME sector increases slightly, by 1.5%. Although the SME sector expands significantly, strong competition leads to rising wages and therefore average profits grow only slightly. However, the strong expansion of consumption increases VAT revenues, i.e. SME productivity also increases indirectly general government revenues significantly.

Lessening entry barriers

In the second simulation, the costs of becoming a supplier fall by 20%. This experiment can be seen as an economic policy intervention that selectively reduces the administrative burden on businesses. The first panel shows a significant increase in the number of supplier companies and their share within the SME sector. At the

same time, the share of domestic suppliers in multinational companies' procurement is rising only slightly. That is, although several SMEs will be suppliers, in the absence of productivity growth, they will be able to compete primarily with each other and not with imported inputs.

Figure 2
Lessening entry barriers for suppliers



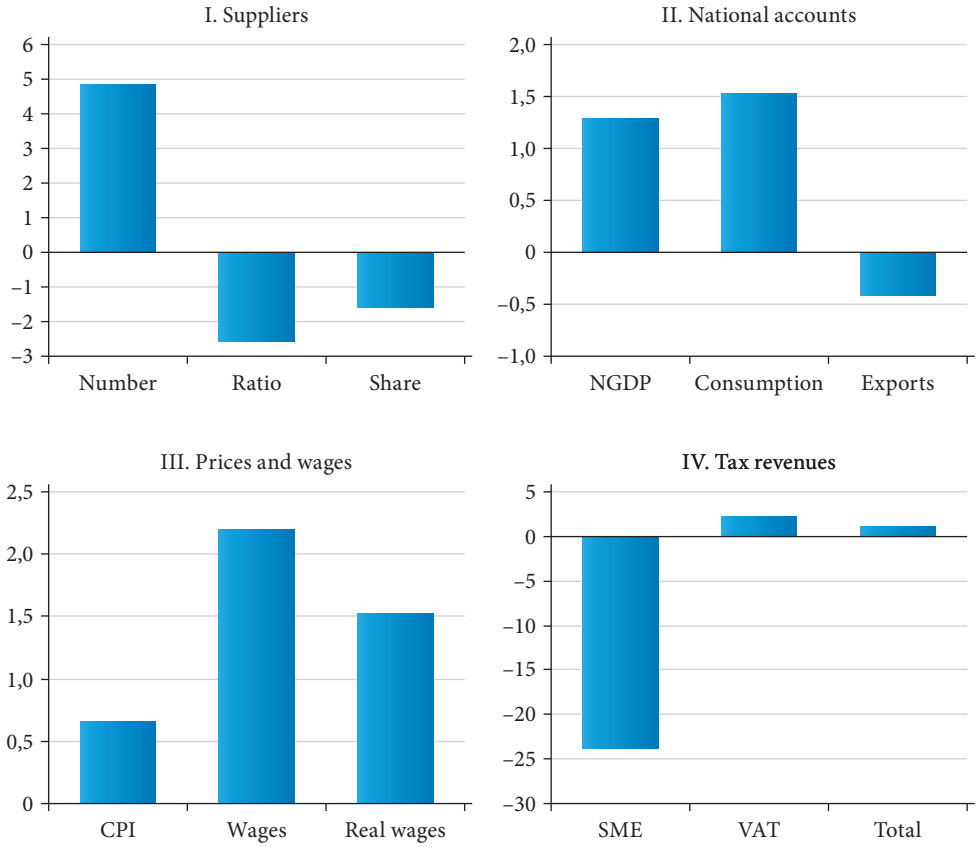
Nominal GDP grows slightly, consumption also rises, while exports decline somewhat. However, nominal growth largely means an increase in the price level. Nominal wages also rise, but only less than half of the increase is reflected in real wages. Tax revenues rise as well, again mainly due to VAT payments.

Decreased SME taxes

The number of supplier companies grows, but to a lesser extent than the SME sector. Interestingly, the share of suppliers in the multi sector declines as well, i.e. in this sense their competitiveness relative to imported inputs declines. As in the previous

scenario, the reason for this is that the increased SME sector faces increased wages and thus be at a cost disadvantage compared to imported products.

Figure 3
Decreasing corporate taxes in SME sector



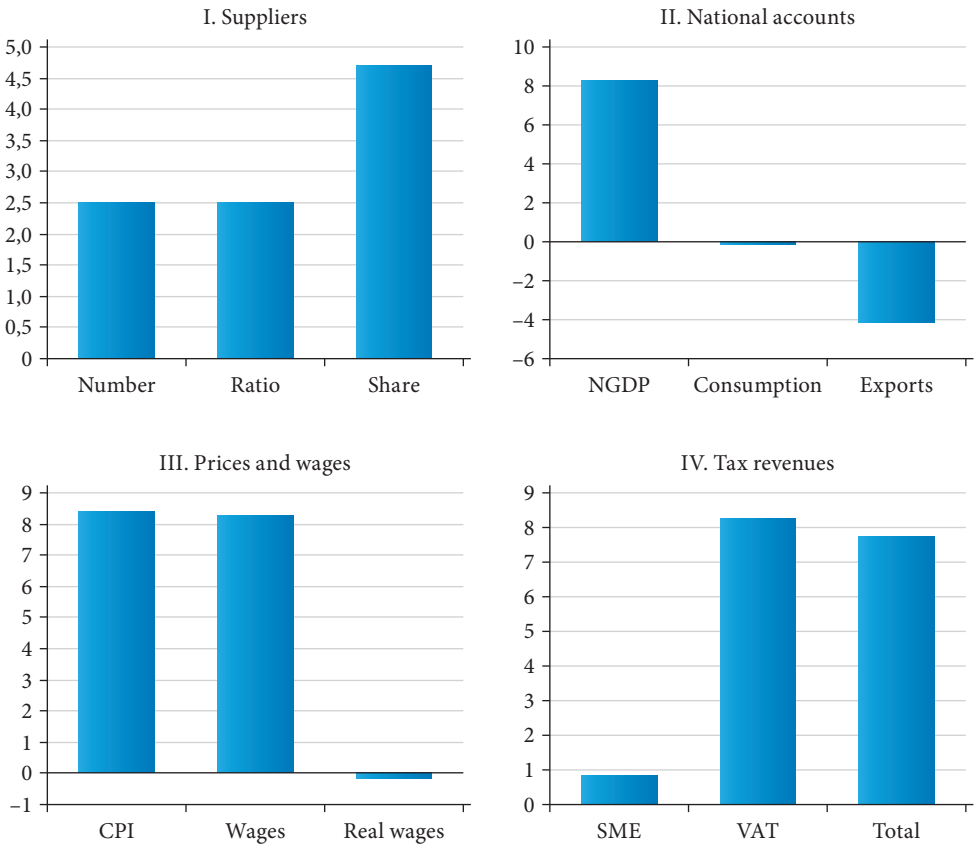
Nominal GDP is growing, along with consumption. Exports are declining, mainly because of rising costs due to rising wages. Both price levels and wages rise, but real wages are growing overall.

Unsurprisingly, SME tax payments are significantly lower. But as these were not significant in absolute terms anyway, the economic recovery will offset this and tax revenues increase overall due to VAT payments. However, it is also worth noting that due to the price increase, the real value of tax revenues increases only slightly overall: total tax revenues increase by 1.11%, while the consumer price index increases by 0.66%.

More expensive imports (shortening value-chains)

In the last simulation, we examine the possible impact of rising import costs on the supplier sector. This is modelled by rising transport costs, but the scenario can also be interpreted as examining the impact of the shortening of global supply chains on the Hungarian economy, as observed in recent years, which is likely to accelerate even further due to the COVID pandemic. As a member of the European Union, Hungary can benefit from this process if companies from Germany and other large member states relocate their assembly plants from Asia to the Central and Eastern European region.

Figure 4
Increase in import costs



The results are shown in Figure 4. According to the first panel, the number of suppliers, their share within the SME sector, and their share in the procurement of multinational companies all increase. However, this is not necessarily beneficial from a national economic point of view. Although nominal GDP rises, consumption and export volumes decrease.

The increase in transport prices is a cost shock: multinational companies can only produce at higher costs. Rising demand for domestic suppliers raises not only wages but prices as well, so real wages – and thus consumption – are virtually stagnant. Tax revenues are increasing overall, but their real value is declining somewhat due to price increases.

Summary

We have briefly presented a model that is suitable for studying the dual role of the SME sector in the domestic economy. A small, more productive part of SMEs is able to act as a supplier to multinational companies present in Hungary, and thus to join global value chains. The model was quantified with some important data of the Hungarian economy, and with the help of the calibrated model we performed various economic policy simulations.

The lesson of these simulations is that several economic policy instruments can be used to increase the weight and competitiveness of suppliers. However, their macroeconomic and budgetary implications are very different. The most effective tool is to increase the productivity of small and medium-sized enterprises (or, in the same way, to reduce the administrative burden of setting up an SME). Selective support for suppliers is less effective, while shortening global value chains is a good option for suppliers but has a more negative impact at the national level. However, a reduction in the tax burden on the SME sector can also be proposed from a budgetary point of view, as rising VAT revenues offset the loss of income tax.

Increasing productivity is not an easy task and can only be indirectly influenced by economic policy. However, reducing the administrative and tax burden on the SME sector is relatively easy to achieve and would have a positive effect based on simulations. However, these tools are of course of limited use, so increasing productivity is the key to lasting competitiveness. The main challenge for economic policy is to find the proper way to help this process. Since the productivity of Hungarian SMEs is low compared to their foreign competitors, there is still room for substantial improvement.

RENÁTA BUDAI–TAMÁS TRENYIK[1]

Challenges related to WEEE management and their possible system-level solutions

Electrical and electronic equipment is entering the market in increasing quantities. The collection, pre-treatment and utilisation of their waste (WEEE) is a significant task but the compliance with the relevant EU and national regulations poses serious challenges.

The purpose of this summary is to present the expectations, challenges, and description of a system that can achieve them. We present the effects of the proposed system on the national economy. The model of the proposed system was chosen from several possible models by modelling the options – impact assessment was performed on these models.

The amount of electrical and electronic products is constantly increasing, together with the recycling and recovery obligation

The growth of electronic and electrical devices is unbroken and dynamically increasing since 2013. Based on the yearly data envisaged by the National Collection and Recovery Plan (OGyHT), and the actual product quantities, the volume has more than doubled in the last half decade. However, the amount of the resulting product fee is only partially returned to the collection–pre-treatment–recovery system.

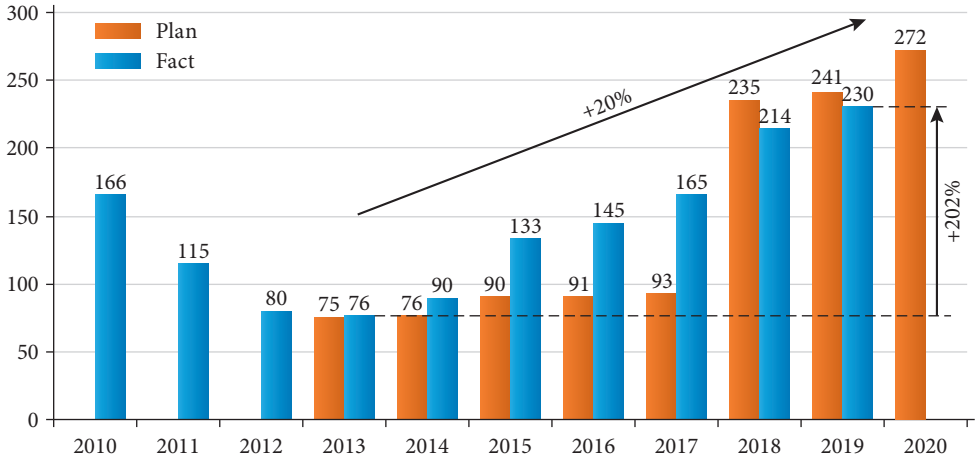
EU regulations required 45% of emissions to be recovered by 2018, this changed to 65% from 2019. Instead of the narrower product grouping, the new list system introduced six groups, resulting in more quantities involved, which further increases the scale of the challenge. The new classification is based on the recycling/recovery method and includes the following groups:

- Heat exchange equipment
- Screens, monitors, and equipment containing screens having a surface greater than 100 cm^2
- Lamps

[1] Blue Planet Climate Protection Foundation.

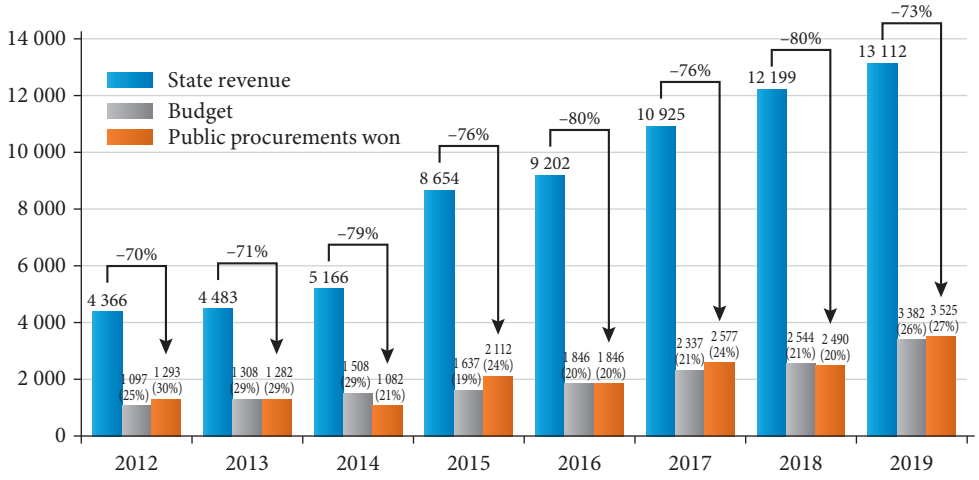
- Large equipment (any external dimension exceeding 50 cm)
- Small equipment (none of the external dimensions exceeding 50 cm)
- Small IT and telecommunication equipment

Figure 1
Planned and actual emissions in the E + E material stream (million kg)



Source: Plan data: 2013–2020 Plan OGyHT; factual data: NAV (National Tax and Customs Administration) environmental product fee data provision 06.02.2020 and 22.07.2020.

Figure 2
Development of state revenues and expenditures in the E + E material flow (HUF million, %)



Source: State revenue: NAV Environmental product charge data provision (06.02.2020 and 22.07.2020), Budget: OGyHT, Procurements won (Procurement data obtained are from own research, may differ from actual performances for which no data are available. https://www.kozbeszerzes.hu/adatbazis/keres/hirdetmeny/).

Financing and organisation of the system must be changed

Based on domestic experience and international good practices, the system can be considered appropriate if its operation complies with the "polluter pays principle" and "the principle of extended producer responsibility". It is transparent, traceable, flexible, and able to respond to market effects. It contains clear, delimited responsibilities for all stakeholders, its funding is continuous and focusses on quality in production and recovery technology. A well-functioning system is an incentive for all stakeholders, it works predictably and stably in the short, medium and long term, is built according to the systems approach and public participation is maximized. Control functions are in place, industrial development is strategic, transparent, and controllable, and supports the shift toward real recovery. Therefore, these are the success criteria of the system. Along these, three models were examined and evaluated.

State model: The state is responsible for all activities, legislation, and coordination of the treatment actions of the waste stemming from the product-fee covered waste stream, through institutions or companies established by the state. The state is also responsible for achieving EU collection and recovery targets. The system is necessarily based on public procurement, in which the state participates as a contracting authority. The annual planning is hampered by the lack of communication between certain state authorities and bodies. The state is responsible for related communication and support for industrial development.

Producer responsibility model with strategic coordination centre: Manufacturers have financial and organizational responsibilities. The Strategic and Coordination Centre (SCC) performs professional, *ex-ante* control, but not official tasks. The control tasks of the state will be simplified, and complex inspections will be possible. The state can, together with the SCC, perform tasks independently without the influence of market participants, employing its experts under market conditions.

Mixed financing model: It conforms to the producer responsibility model, with the difference that the producers finance the public authorities' product-fee activities in a defined and accountable way, with special regard to the implementation of control functions.

Figure 3
Evaluation of funding and organizational models

Based on the evaluation along the success criteria, the selected and proposed model is the producer responsibility model. In addition to the state, other actors also have an important role to play in this system.

Responsibilities of state actors: Achieving EU waste-management goals, establishing a legal and institutional system, operating an IT system, data collection, implementation.

Ministry of Innovation and Technology: Creation of strategy and legislation, creation of conditions for implementation, official inspections, fulfilment of EU data provision.

National Tax and Customs Administration: Receipt of data from manufacturers, aggregation, communication, control, tax audit, imposition of fines and sanctions.

Prime Minister's Office/Directorate of Environmental Protection of Government Offices: Registration of producers, licensing of collectors and waste handlers, receipt of data from waste producers, waste collectors, handlers, data collection, data disclosure, inspection, fines and sanctions.

Minister without Portfolio for National Asset Management: State owner in waste enterprises, compliance with legislation, implementation of public service strategy, operation of civic amenity sites as a public service provider, provision of services as a public service provider and participation of state-owned waste managers in the system.

Ministry of Agriculture: Operation of the National Environmental Information System (OKIR), professional supervision of government offices.

Ministry of Finance: tax legislation, budgeting.

Ministry of the Interior: Services areas through the Disaster Management Organization where the Public Waste Management Service does not operate.

Local government: Contracting with a public service provider, determination of the conditions for the provision of public services, adoption of local government decrees.

National Coordination of Waste Management and Asset Management Plc: Collection and redistribution of the fee of the Public Waste Management Service, preparation of the National Waste Management Public Service Plan.

Responsibilities of other actors: Enforcement of the extended "producer responsibility" and "polluter pays" principles, active participation in the collection and attainment of recovery targets, encouragement of the public and end-users.

Professional association: Adoption of professional opinion on strategies and legislative amendment plans, formulating proposals for the designation of development and strategic directions, education, training, advocacy.

Strategy and Coordination Centre (SCC) (key player): Proposing strategic directions for waste management, *ex-ante* control of PROs, producers, actors of the waste management system, development of data provision software, data analysis, pre-regulatory control, enforcement of the principle of total net costing and elaboration of the minimum fee, proposing amendments to the legislation, elaboration of an incentive system to achieve maximum performance.

PRO (key player): Collective enforcement of the extended producer responsibility principle, organization of collection and recovery, conclusion of contracts, achievement and surpassing proportionate collection and utilization targets, communication to and education of the public and end users, proposing legislative amendments, placing producer payments on the waste market, SCC financing, data provision.

Public waste management service provider: Obtaining a prior permit, concluding a contract with the municipality and the PRO, delivery of the contracted quantities, participation in the collection, active participation in the communication, operation of waste yards.

Producer: Proportional financing (at total net cost), achievement of proportionate goals (collection, recovery), take-back, provision of information, education, creation, operation, and financing of an ERP system, provision of data, declarations, execution of other administrative tasks, achievement of eco-design product development goals.

Retailer: Participation in increasing collection volume, take-back, participation in information transfer, education, encouragement of the population and end users.

Household: egress of waste, prohibition of illegal dumping.

Waste collection, treatment, and recovery: Obtaining a prior permit, concluding a contract with the coordinator, fulfilling the contracted quantities, providing data, active participation in communication, service development, technology development, cost-effective task performance, cost optimization.

The *material flow* of the selected model is complemented by the involvement of PROs. The material flow in the proposed model does not differ significantly from the current material flow; its direction and complexity do not change. The essential difference is that the basis of the framework contracts of the PROs in question, collectors and pre-handlers ensure the appropriate proportions of collection. In addition, with producer financing, the collection volume of public service providers can be increased, and the households can be interested in the delivery of waste through appropriate channels. Public service providers set up collection sites and civic amenity sites for a specific population. Producers and retailers are actively involved in take-back, encouraging households and businesses to give the waste back. The actors take part in the communication and the raising of awareness, which contributes to the achievement of the collection and recovery goals.

The *cash flow* of the selected model will change at several points compared to the current one. According to the cash flow of the proposed model, manufacturers pay to PROs a *pro rata* fee instead of or/in addition to the product fee. Fees are set and published by PROs on an annual basis, based on the principle of total net cost. The SCC examines the prices and proposes minimum prices. In case of non-compliance, the underlying liability of the manufacturers shall proportionately prevail. PROs also finance collection, treatment, and recovery based on annual contracts, and their contracts are examined by SCC. Public service providers receive funding for the quantities collected from PROs, just as the construction of collection sites can be co-financed.

It is also recommended to deviate from uniform pricing. There are also differences in costs between areas, the treatment costs of each waste category differ significantly, and the value of the extracted materials and the costs of disposal are also highly differentiated.

Possible directions for the development of the pre-treatment and recovery system

After the establishment of the financing and organizational system, we examined to what extent and by which methods Hungary should participate in the pre-treatment and utilization. At present, domestic companies are typically engaged in

pre-treatment, and the utilization of critical raw materials is only possible in a few places across Europe.

In the field of pre-treatment and utilization, unlike the collection area, the predominance of sole proprietorships is typical; the state is connected to this part of the system by legislation and the co-operation with pre-treatment and utilization capacities.

The extraction and recovery of the materials contained in the collected WEEE is important because they contain significant amounts of base metals, precious metals, and so-called critical raw materials. The critical raw materials are particularly important as their natural locations are significantly linked to the Asian and American continents, and alternative possibilities of extraction and use of those types of secondary raw materials must be created in order to reduce dependence. However, the recovery of precious metals and critical raw materials is only possible after a sufficiently high level of manual and mechanical pre-treatment.

Table 1
Material composition of the main electronic product groups (%)

Category	Iron	Cooper	Aluminium	Silver	Gold	Palladium	Plastic	Glass	Other
Heat exchange equipment	45	6	3	0.000	0.000	0.000	20	0	26
Screens, monitors	24	3	3	0.006	0.003	0.001	26	27	18
Lamps	3	0	18	0.000	0.000	0.000	15	52	12
Large machines	43	2	10	0.023	0.000	0.000	10	6	29
Small machines	31	7	9	0.005	0.001	0.000	32	0	21
Small IT equipment	20	5	2	0.026	0.008	0.002	51	0	21

Source: Study on WEEE recovery targets, preparation for re-use targets and on the method for calculation of the recovery targets – Final report.

The success criteria for planning a system that achieves the highest level of recovery are cost-effective plant size, transparency, traceability, flexibility, quality focus, predictability and stability, a system approach, and a shift towards real recovery. Based on these, three models were evaluated.

Mechanical pre-treatment: the domestic system is based only on collection and pre-treatment, the obligation of pre-treatment covers all categories. However, it uses only mechanical pre-treatment and shredding. The focus of recovery is on macro metals.

Manual and mechanical pre-treatment by material separation: only collection and pre-treatment companies are in the domestic market, but the pre-treatment obligation changes within categories. Machine-made pre-treatment is preceded by

manual disassembly, during which valuable parts are removed before shredding. This enables the extraction of critical raw materials in addition to macro metals in subsequent processes.

Pre-treatment and utilization: domestic activity does not end with pre-treatment, material recovery is also part of the system. The other parameters are the same as of the second model.

Figure 4
Evaluation of pre-treatment and utilization models

Best / Worse	Mechanical pre-treatment	Manual and mechanical pre-treatment	Pre-treatment and utilization
1. Cost-effective plant size	●	●	○
2. Transparency	◑	◕	●
3. Traceable	◑	◕	●
4. Flexible and able to respond to market effects	◕	◕	◔
5. Quality focus	◔	◕	●
6. Works predictably and stably in the short, medium and long term	◕	◕	◔
7. The system approach prevails	◑	◕	●
8. Supports the shift toward real economy	◔	◕	●
Sum	18	25	22

Source: Own compilation.

Of the evaluated models, the "manual and mechanical pre-treatment model" performs the most balanced in the examined evaluation aspects, so it is recommended to develop and implement this model. The advantage of the model is that it takes into account the different material composition of each category and their subgroups and it defines different pre-treatment methods and target materials for them. The economic added value of the sector will increase, and it will provide surplus material to support the circular economy, the production of secondary raw materials will be possible and the model will contribute to the fulfilment of the obligations under the Landfill Directive (up to 10% landfilling). As disadvantages of the model it can be mentioned that expanding the usual collaborations can be difficult, it requires complex logistics and task-sharing coordination, and increases the cost of system operation.

The proposed model offers a solution to the challenges and risks of the current system

The producer responsibility model reflects a systems approach, and its elements ensure that the success criteria are fulfilled. The main goal of the system is to provide an incentive for all stakeholders, ensure a quality focus and maximize public participation. The system ensures that the "polluter pays principle" and the "principle of extended producer responsibility" are realized. By controlling the inspection, the system becomes transparent and traceable, and the operation of the control functions is ensured. By building the model, the system becomes flexible and able to respond to market effects, but at the same time, it can operate predictably and stably in the medium and long term. The responsibilities are clearly delimited, which enables a transparent and controllable industrial development strategy. The principle of continuous financing prevails through the allocation of the product fee.

By changing the financing and organizational system, the number and incentives of actors will be improved; the creation of an information exchange platform between producers and users will be possible. The reliable and predictable operation will also have a good impact on industrial development. The creation of competing capacities can be minimized; instead, it is possible to develop interlocked capacities.

By introducing/expanding manual pre-treatment, the current capacity can be increased. The standardization of pre-treatments ensures the unification and extension of treatment processes to all actors. This makes the system suitable for the further recovery of critical raw materials in addition to macro metals. The strengthening of the markets may need to be assisted by legislation.

However, as with any new model, there are risks that need to be addressed in the future.

Political risk: The proposed models are significantly different from the current ones, so there are political risks attached to the transformation.

Operational risk: Without detailed elaboration, the system will become dysfunctional. Defining responsibilities and obligations are very important. Standardization and extension of pre-treatment to all actors is needed.

Quality risk: Manual pre-treatment must be made compulsory and quality standards have to be introduced (application of international standards).

Financial risk: The significant additional state revenue realized in the current system will disappear (the non-recycled part of the product fee). However, the operating cost will increase. The price of recoverable materials typically depends on world market prices.

Time risk: The system contains new or partly new tasks for manufacturers, traders and institutions alike, with a change in responsibilities, thus sufficient time has to be ensured for them to prepare for the changeover. The introduction of higher standards will also require significant time.

IT risk: It is necessary to develop the IT infrastructure on both the institutional and the manufacturing side. It can ensure data provision, data processing, data filtering and a realistic picture of the entire market from the very beginning of the system.

Industrial development risk: Systematic industrial development requires factual data, a national survey, and a cost-benefit analysis. Without them it is not possible to determine exactly where to go, what the goal is, what technology is needed. It is necessary to determine the types and quantities of waste involved in the treatment according to higher standards, on the basis of which the direction of development, priorities and its estimated resource requirements can be determined.

Communication risk: The involvement of the households is essential since citizens have to be convinced to dispose of the generated waste in this system. Communication between actors of the system is also vitally important. Manufacturing technologies are evolving rapidly, life cycles are shortening, assortment changes are common, which also brings about changes in material compositions, and input becomes more heterogeneous. Accurate knowledge of inputs is required for a proper pre-treatment.

Strategic risk: Strategic decisions are required on how to prevent the creation of excess waste and the reuse of waste.

* * *

The "producer responsibility model" and the "manual and mechanical pre-treatment by material separation model" offer a solution to the challenges of the current system and by managing the described risks it is possible to plan and operate a well-functioning system that is compliant with European Union legislation.

ANDRÁS VARRÓ–TAMÁS SZABÓ[1]

Interactions between sustainable development and public finances on the example of air quality

Introduction

Air pollution has serious impacts on health, life expectancy and quality of life. Effects of harmful air pollutants can be felt through poor air quality in the short run and cause significant health risks in the long run.

The need for action is highlighted in numerous environmental-protection related government documents and the topic – as it is strongly connected to climate protection – is expected to remain a priority in the upcoming EU budgetary cycle as well.

At Hétfa Research Institute, on behalf of the Fiscal Council, we have studied the interactions between sustainable development and public finances, using the example of air quality. While drafting the study we relied on the secondary analysis of available evaluations and databases, reviewing the relevant literature, the goals of government strategies and domestic trends based on available statistics and measurements. Furthermore, we also monetized the expenses that may directly or indirectly affect the state budget.

During our research, the main sources of air pollution, its territorial patterns and temporal changes were examined as well as the social-economic effects of air pollution and the indirect losses it causes to the budget.

While evaluating the mitigating measures, we used the method of cost-benefit analysis (CBA); our proposals have been elaborated after these calculations, based on the results obtained.

The main sources of air pollution

The sources of air pollution can be divided into four groups (Greenpeace, 2020): natural and anthropogenic pollutants, furthermore primary and secondary pollutants. Natural pollutants arise from non-human activities while anthropogenic ones are the result of human activities (e.g. transportation, commercial

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and domestic energy use, industrial activities, biomass burning, and agricultural activities). Primary pollutants include materials that were emitted directly from the source (e.g. factories' chimneys, cars' exhaust pipes). Secondary pollutants are born when a chemical reaction with a primary pollutant occurs. *Particulate matter (PM10 and PM2.5), ozone, sulphur dioxide and toxic metals are regarded as the most important air pollutants.*

Air pollution – in the first place due to its harmful effects on health – has significant economic consequences, shortens life expectancy, increases healthcare expenditures and, due to the lost working days, decreases productivity and tax incomes. Furthermore, it negatively affects the flora and fauna, spoils the quality of water and surface, therefore the quality of life and certain economic branches, such as tourism or agriculture. (Greenpeace, 2020)

Air pollution resulting from fossil fuels causes approximately *4.5 million premature deaths each year globally,* increases the number of acute diseases and the need for hospital treatments, and causes billions of lost working hours. *The economic cost arising from fossil fuels is estimated to 3.3% of the global gross domestic product.* (Greenpeace, 2020)

Situation in Hungary

Currently in Hungary the air quality and the concentration of the most important pollutants are measured at 51 stations in 34 settlements. The *Air Pollution Index* consists of the data on the level of sulphur dioxide, nitrogen dioxide, other nitrogen oxides, carbon monoxide, ozone, particulate matter (PM10 and PM2.5) and benzene measured at the stations by the domestic meteorological service. According to this index, *in 2018, the air was nowhere "strongly polluted". In the surrounding areas of 39 stations, the quality of the air was "good", while around 10 stations it was "appropriate", and it was "polluted" around 5 stations.* (OMSZ, 2018)

According to the report of European Environmental Agency (EEA, 2017), in Hungary, *PM2.5 was responsible for the premature death of 11.970 people, that equals 129.400 years of life lost and 1.310 per 100.000 inhabitants,* which is one of the highest number among the examined European countries (beside Bulgaria, Kosovo, Macedonia, Serbia and Poland). *Nitrogen dioxide caused 1.210 premature deaths,* while 350 people died due to ozone pollution. 13.100 years of life lost can be attributed to nitrogen dioxide (133 years lost/100.000 inhabitants) and *3.800 to ozone* (38 years lost/100.000 inhabitants).

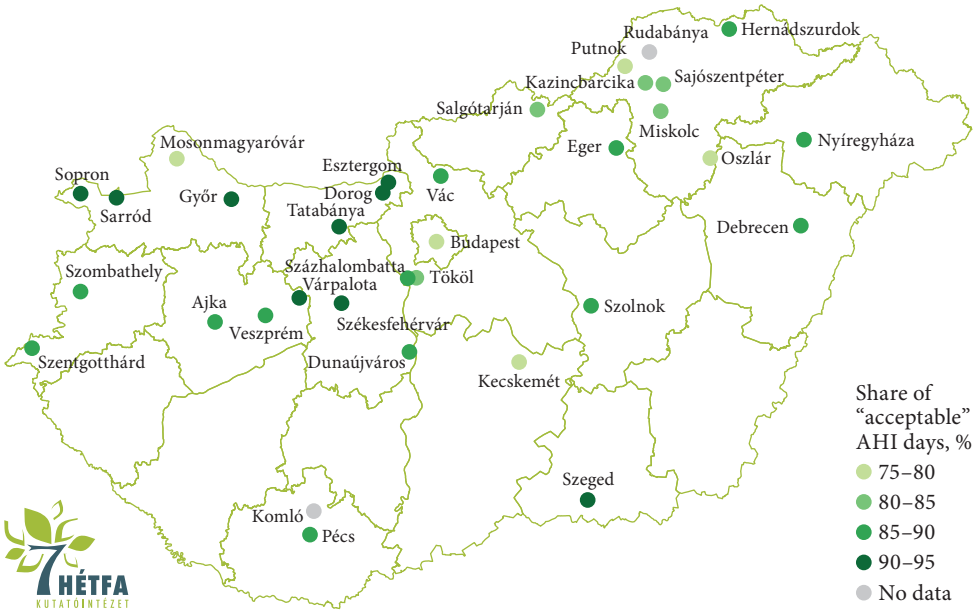
In our study, the air pollution of Hungarian settlements was examined through the data of the automatic monitoring network of the Hungarian Air Quality Network and the Air Hygiene Index (AHI) (provided by the National Public Health Centre, NPHC), for the period between 2015 and 2019.

AHI is based on the results of the monitoring network and takes the most important air pollutants into account. Its score is defined daily by the NPHC according to the 24 hours average concentration of PM2.5 and PM10, the daily maximum of

one-hour means of nitrogen dioxide and the daily maximum of eight-hours moving average of ozone.[2]

On the two maps below, we depicted the scores of AHI between 2015 and 2019. On the first map, the share of "acceptable" days, while on the second, the share of "unhealthy" or "dangerous" days from all observations can be seen. There is a medium strong correlation (–0,67) between the two series, meaning that *the higher the share of "acceptable" days, the lower the share of "unhealthy" or "dangerous" days, and vice versa.*

Figure 1
The share of "acceptable" AHI days from all observations, 2015–2019



Source: NPHC, edited by Hétfa.

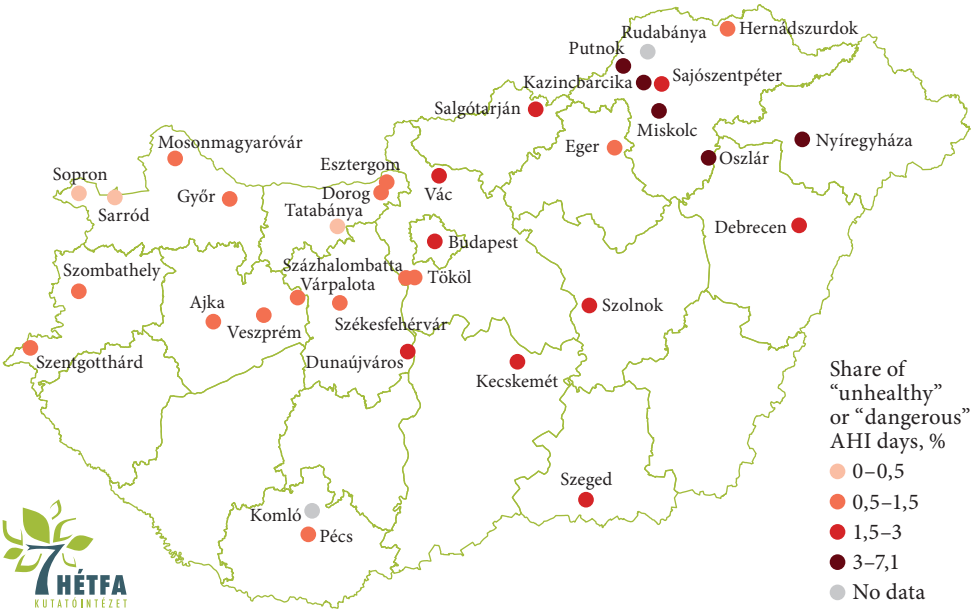
Cities where the share of "unobjectionable" days was above 90% from all observations between 2015 and 2019 (Dorog, Esztergom, Győr, Sopron, Szeged, Székesfehérvár, Tatabánya and Várpalota), all can be found in the Transdanubia region with the exception of Szeged. The lowest share of "unobjectionable" days was registered in Budapest (74,4%), meaning that in the capital, the air quality was reprehensible every four days. The second worst is Putnok in Borsod-Abaúj-Zemplén county (share of "unobjectionable" days is 76%), besides that, the share of "unobjectionable" days was below 80% in Kecskemét (Bács-Kiskun county), Mosonmagyaróvár (Győr-Moson-Sopron county) and Oszlár (Borsod-Abaúj-Zemplén county). The interviews with experts gave us a clue, that the causes of relatively wrong air quality are different

[2] https://www.nnk.gov.hu/index.php/kozegeszsegugyi-laboratoriumi-foosztaly/terkepes-informaciok/levegohigienes-index/694-a-levegohigienes-index-ismertetese.

in the capital and in the Eastern parts of the country. *While in Budapest, the main problems are the traffic and the inefficient energy use of the households, in the poorer regions energy poverty and the above-average penetration of solid fuels can be identified as the main sources of air pollution.* In addition, these regions dispose of heavy-industry facilities, furthermore import air pollutants from the surrounding countries, and even their terrain may hinder the cleaning of the air.

The poor energy condition of Hungarian residential buildings significantly contributes to the high level of air pollution. Countrywide, doors and windows should be changed in 31.8% of residential buildings, and heating systems should be renewed in 8.5% of them. (KSH, 2015) 70% of domestic housing stock does not meet the up-to-date functional, technical and heating criteria, and the same applies to the non-residential building stock. (ÁSZ, 2019)

Figure 2
Share of unhealthy or dangerous AHI days from all observations, 2015–2019



Source: NPHC, edited by Hétfa.

PM10

We examined the concentration of PM10 as the Hungarian Air Quality Network collects ample data regarding this pollutant. The territorial patterns we identified are similar to the patterns of AHI, the most polluted areas can be found on the North-Eastern part of the country. In Putnok and Sajószentpéter, the PM10 concentration exceeded the limit value every five days, which can be attributed to the causes mentioned in the AHI chapter. The share of days when the concentration exceeded

the limit was over 10% as well in nearby Miskolc (15.7%), Kazincbarcika (14%), Vác (13.6%), and Nyíregyháza (11.6%). In Budapest, between 2015 and 2019, the share of the days above the limit was 10.2%. *The relatively and absolutely high rate of the excesses explains why the costs derived from PM pollution represent the largest share of air-pollution related expenditures.*

Nitrogen dioxide

In terms of nitrogen dioxide pollution, Budapest is the worst affected, 1.84% of the hour observations exceeded the allowed limit. Besides the capital, Pécs is above 1% (1.29%) as well, while in Debrecen, the share of exceeds was almost 1% (0.96%). While settlements in Borsod-Abaúj-Zemplén county are among the worst as regards PM10 pollution, their nitrogen dioxide pollution is negligible, because *the main source of this pollutant is transport; therefore it is mainly an urban issue.*

Ground-level ozone

In the case of ozone, the limit has been set regarding the maximum of the so-called 8 hours moving average, meaning the 8 hours period when the concentration is the highest has to be found.

Examining the results of four years, we identified Mosonmagyaróvár as the most polluted city, where the moving average was over the limit in 3.88% of all observation windows. None of the other stations registered value above 3%; the second most polluted city was Kecskemét (2.11%). In Budapest, the share of exceeds was 1.49%, which means that in terms of ozone pollution, Szombathely, Sarród, Salgótarján, Veszprém and Ajka are in worse position.

Ozone pollution is subject to certain seasonality, especially in cities during summer, when the number of hours of sunshine is high.

Economic damage caused by air pollution

In our research, we attempted to quantify the damage caused by air pollution as well as the potential benefits that its alleviation may bear. *Our starting point was that the main effect of air pollution is that people who are strongly exposed to it die earlier than others; therefore valuable years are lost on national level.* This value is called Value of Statistical Life (VSL). In order to define Hungarian VSL we used the OECD's method. (OECD, 2012) In this study, OECD mapped individuals' willingness to pay (WTP), e.g. how much they would be willing to pay to decrease the probability of premature deaths. They pointed out that this value does not equal the value of human life, but is the aggregation of single risk reduction values. By the synthesis of numerous studies, they also defined the value based on the self-assessment of individuals. With the

proper use of this aggregated value, the country specific indicator can be defined. Based on this method, *we defined USD 3.2 million (approx. HUF 974.7 million) as the average statistical value of a Hungarian's life.*

With the help of VSL, economic damage caused by years of life lost due to air pollution can be quantified. Decrease in life years due to three air pollutants (PM, nitrogen oxides, ozone) divided by the current life expectancy (79.33 years), leads us to the estimation that *annually 1844 lives are lost in Hungary due to air pollution.* Using the method presented above, this *means HUF 1 797 billion economic loss annually, which is 3.8% of Hungary's GDP in 2019.* The biggest economic damage is caused by PM2.5, which is responsible for 90% of the total GDP loss, therefore decreasing the level of this pollutant would be the most cost-effective step.

Another approach to quantify the losses is the examination of interactions between life expectancy and GDP. According to the Air Quality Index, recently elaborated by the University of Chicago, air pollution shortens life expectancy by 2 years globally, and by 0.4 years in Hungary (0.5 years in the most polluted Northern regions). Earlier studies suggest that 1% increase in life expectancy may increase GDP *per capita* by 6–8%.

0.4 extra years life expectancy would mean 0.5% growth compared to the current situation, meaning that *if Hungary met the WHO's air pollution standard criteria, the country's GDP per capita would be higher by 3–4%,* which would result in HUF 823 billion increase in the revenues of the state budget.

The cost of air pollution is not the same in urban and rural areas, the highest cost per unit is induced by urban PM2.5 pollution. *One unit of PM2.5 in a Hungarian city cost EUR 102 in average, while in the sparsely populated regions only EUR 59.* This difference also exists in the case of nitrogen oxides: one unit costs EUR 26.8 in urban areas and EUR 15.8 in rural areas. (CE Delft, 2018)

Policy recommendations

The sources of air pollutants are usually easy to identify; so are the most efficient measures to decrease their level. According to the data by the Hungarian Meteorological Service, the most complex problem is the nitrogen dioxide, as its emission is the less concentrated: 41% can be attributed to transport, 21% to households and 16% to agriculture. Agriculture is also responsible for 90% of ammonia emission, and the emission of PM2.5 is concentrated to similar extent, as households are responsible for 86% of its emission. The government's PM10 Programme claims that 67% of PM10 emission can be attributed to the households. (PM10 Programme)

Therefore *the two most important intervention areas are the energy use of households and transport.* In our cost-benefit analysis we examined the expected economic payback of certain measures regarding these fields.

From the aspect of public finances, *the most efficient measures are those aiming to reduce the PM concentration in the air.* In the long term, the most efficient

tool is to invest in infrastructure or assets, but in the short term the cleaning of frequented roads (during the spring and summer periods) may have positive results as well.

- *Car scrappage schemes:* In Hungary, there are approximately 274 thousand Diesel cars of obsolete emission classes, which are the biggest pollutants of the Hungarian car fleet. A car scrappage scheme – supported by tax advantages or acquisition at administrative price – might be able to reduce the number of vehicles older than the Euro IV emission class. In our study, we outlined three possible alternatives regarding this scheme that can reduce the economic damage by HUF 17.35 billion. This kind of scheme would be recovered in nine years.
- *Modernization of the bus fleets in cities:* We advise to switch from obsolete, pollutant Diesel buses to modern buses, meeting the Euro VI emission class standards. Since the technology of electronic buses is not mature yet (strength of batteries, lack of recharging stations), instead of them or in parallel with their procurement, acquisition of low-emission, Euro VI buses offer a viable alternative. This kind of buses emit 92% less nitrogen dioxide than Euro I vehicles, which means that the economic damage could be reduced by HUF 4.738 billion. Additionally, the PM emission from exhausts of Euro VI emission class buses is 98% lower, than that of the Euro I buses, therefore damage deriving from PM can be reduced significantly as well.
- *Development of no-traffic zones:* Zones where cars worse than Euro IV emission class are not allowed to drive in can be designated within the most densely populated downtown areas. The example of the Lausanne-Morges region shows that reducing the level of PM10 by 3.3 microgram/m^3 in ten years by traffic alleviation can prevent 26 premature deaths, 290 years of lives lost and 47.000 days of sick leave annually, which is worth approximately 36 million CHF (HUF 11.5 billion).
- *Increasing the efficiency of wood heating:* Supporting the switching from wood heating to pellet heating could result in a 17% fall in the PM2.5 emission of the households, therefore the economic damage would decrease by HUF 173,000 per household. Such programme should include the overview of the social firewood programme as well (e.g. distributing social pellet instead of social firewood, eliminating the distribution of wet firewood and inefficient, polluting lignite as social aid).
- *The enforcement of the prohibition of litter and garden waste burning* by the authorities, and the continuation and expansion of related campaigns. Air pollution stemming from such activities contribute to the European Union's infringement procedure against Hungary that is likely to entail considerable economic loss.

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