



COMPETITIVENESS REPORT



2020

'To see what everybody else has seen and to think what nobody else has thought.'

Albert Szent-Györgyi



COMPETITIVENESS REPORT

2020

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The purpose of the Competitiveness Report is to provide a comprehensive, objective picture of the aspects of Hungary's competitiveness that are less in the focus of the central bank's traditional macroeconomic analyses, although they are determinants in terms of economic developments. In 2016, the Magyar Nemzeti Bank published the book entitled 'Competitiveness and Growth' to analyse Hungary's competitiveness and explore options for moving forward, then, the Competitiveness Programme, published at the beginning of 2019, in addition to a detailed analysis of the situation, also makes specific proposals in the key areas of intervention to achieve the turn in competitiveness. The Competitiveness Report examines and evaluates Hungary's competitiveness position in accordance with the principles of the book and with the identified structural areas and proposals laid down in the Competitiveness Programme.

For the MNB, competitiveness means the level of all factors that determine the long-term performance of the economy, including, inter alia, productivity, the quantity and quality of human resources, technological progress, the regulatory environment, entrepreneurial attitude, financing possibilities and social and environmental sustainability. Similarly to surveys that analyse competitiveness in international comparisons, this report examines various dimensions, but – in addition to numerical results – it also analyses and assesses these dimensions (along with comparisons over time and on an international scale).

The Competitiveness Report was prepared under the general guidance of Gergely Baksay, Executive Director for Economic Analysis and Competitiveness. This report was prepared by the staff of the Directorate for Fiscal and Competitiveness Analysis, the Directorate Economic Forecast and Analysis, the Directorate Financial System Analysis, the Executive Directorate for Digitalisation, the Institutions, the Directorate Insurance, Pension Funds and Intermediaries Supervision, the Directorate Financial Infrastructures, the Directorate Monetary Policy and Financial Market Analysis, the Directorate Structured Finance Strategy and the Directorate for Social Relations.

During the preparation of the Competitiveness Report we relied on the latest data related to 2019 or earlier periods, available until 30 June 2020; accordingly the impact of the coronavirus pandemic emerging in 2020 are not included.

Contents

Contents	5
1 Executive Summary	7
2 Framework of the Competitiveness Report	12
2.1 Purpose of the Competitiveness Report	12
2.2 Brief summary of Hungary's competitiveness position	15
2.3 Necessary directions of progress	18
2.4 MNB Competitiveness Index 2020	22
3 Situation of the macro economy and results of the competitiveness rankings	26
3.1 Hungarian macroeconomic environment	26
3.2 Results of international competitiveness rankings	32
4 Competitiveness indicators	42
4.1 New financial model	42
4.2 Activation of household savings	54
4.3 SME strategy	58
4.4 Foreign trade	65
4.5 Labour market	72
4.6 Regional and social convergence	80
4.7 Family-friendly programme	86
4.8 Healthy society	92
4.9 Knowledge-based society	101
4.10 Research, development and innovation	110
4.11 Efficient governance	116
4.12 Modern infrastructure and efficient energy use	122

1 Executive Summary

The purpose of the Competitiveness Report of the Magyar Nemzeti Bank is to provide a comprehensive and objective picture of Hungary's competitiveness. Historic experience shows that successful convergence, similar to that of the developed countries, may be achieved by long-term additional economic growth of at least 2-3 percentage points per annum. Owing to the post-2010 comprehensive and profound economic reforms, Hungary has set on a balanced growth path from 2013. Between 2013 and 2019, Hungary achieved an average GDP growth of 3.8 percent, which exceeded the average of the EU's growth by 2 percentage points, while the financial balance of the country also strengthened. However, the long-term maintenance of this exceptional result in the Hungarian history of economics, calls for further reforms and a turn in competitiveness. As part of the central bank's competitiveness analysis works commencing in 2015, in 2019 the MNB published the *Competitiveness Programme* containing 330 proposals in order to support the turn in competitiveness necessary for successful convergence. To monitor the progress of this turn and performing a quantitative assessment thereof, in 2019 the MNB created its own competitiveness measurement system, which comprises of two components. One pillar of the measurement system is constituted by the *Competitiveness mirror*, which measures the realisation of the MNB's 330 proposals. As the second pillar of the measurement system, the *Competitiveness Report* strives to perform a factual analysis and assessment of Hungary's competitive position along the formerly stipulated principles.

Relying on 154 competitiveness indicators, the MNB's *Competitiveness Report* also examines dimensions, determining long-term economic trends, which tend to receive less focus in the central bank's traditional macroeconomic analyses. The analysis of competitiveness is of key importance for the central bank as it affects the economy's long-term growth prospects. Competitiveness and long-term sustainability are closely related terms, since bearing in mind economic and social development only those things can be competitive that are sustainable in the long run, and vice versa. Economic growth exceeding that of the developed countries is not sufficient on its own; by improving competitiveness sustainable development must be given priority, which equally takes into consideration economic, social and environmental aspects. The structural areas and factors examined in the publication determine the key decisions of the economic agents and the potential growth of the economy, and through those also influence yields and inflation in the long run. To provide a comprehensive and objective judgement, the *Competitiveness Report* operates with a wide range of competitiveness indices. Compared to the first issue of 2017, in this publication the number of the examined indicators rose by almost 50 percent, roughly 95 percent of which are objective. In order to summarise and assess the results in a transparent manner, the MNB developed – using its independent methodology – the Competitiveness Index, which gathers 154 indicators of the 12 assessed areas of competitiveness in a single composite index. Our analysis is built on data from 2019, and accordingly it does not reflect the impact of the coronavirus pandemic felt all over the world, affecting economic processes and other areas of everyday life alike.

In the past decade the stable macroeconomic fundamentals, necessary for balanced convergence and the turn in competitiveness, have successfully developed in Hungary. The fiscal turn in 2010 and the monetary policy turn in 2013 created the conditions for balanced convergence. In the past years, the stability of the financial intermediary system strengthened, lending activity increased, the capital market diversified and the share of the domestic households' holding within public debt increased. All these were substantially supported by the MNB's programmes (Funding for Growth Scheme, Bond Funding for Growth Scheme, Self-financing Programme). The reduction of the corporations' tax and administrative burdens and the favourable monetary conditions contributed to the rise in the SME sector's productivity in excess of the EU and regional average. The major cut in labour taxes and other government measures simultaneously stimulated the demand and the supply sides of the labour market. Thanks to this, in 2019 Hungary essentially achieved full employment, which was accompanied in recent years by dynamic wage outflow and major growth in net financial worth. As regards the demographic trends, it is a positive development that by 2018 the fertility rate rose to 1.5 from 1.2 registered in 2011, which was also contributed to by the broadening and augmentation of the support elements of the family support system. Although there is still room for improvement in the area of e-governance, it is being developed on a continuous basis, and the new technologies – online cash register, Electronic Public Road Trade Control System (EKAER), online invoicing, e-personal income tax – contributed to the reduction of tax evasion and to the maintenance of a stable budget.

Despite these achievements, further efforts are necessary in several areas to realise a full turn in competitiveness, which is the pledge of successful convergence. A reflection of Hungary's competitive disadvantage is that the productivity of Hungarian SMEs still considerably lags behind that of large corporations, which may be remedied by increasing the sector's economies of scale and export market activity. Successful convergence is conditional upon the continuous availability of human resources of adequate volume and quality, which becomes an increasing challenge due to the internationalisation of the labour market and the unfavourable demographic trends. For this reason, in the short run the exploitation of the hidden reserves of the labour market bears utmost importance, for example by fostering atypical forms of employment and mobility within the country. In the long run, activity and labour productivity may be increased by improving the health of the population, by achieving a demographic turn which ensures growth in the number of the working age population, and by an education system that complies with the challenges of modern age. In addition to the human and physical capital, availability of the necessary financial capital may be also increased, through which the financial intermediary system would be able to contribute to economic growth to a greater degree. The sector's operating expenses to assets ratio is the highest in the European Union, coupled with high interest rate spread on retail loans. The enhancement of digitalisation would improve the cost efficiency and pricing of the financial intermediary system. In addition, more efficient allocation of capital may be also supported by the further development of the corporate bond and equity market. The public sector may contribute to the long-term growth in national economy productivity by the full digitalisation of public administration, the further reduction of administrative costs and the shadow economy, and by providing modern infrastructure, efficient energy utilisation and green economy.

The main findings of the Competitiveness Report in the individual areas are as follows:

Situation of the macro economy

- Between 2013 and 2019, the average growth rate of the Hungarian economy (3.8 percent) exceeded the average of both the European Union (1.8 percent) and the Visegrád region (3.1 percent), which evidences that the domestic economy has set on a permanent convergence path. The dynamic growth in domestic demand was also supported – in addition to the general government reform programmes after 2010 – by the favourable monetary conditions and the central bank's targeted programmes.
- Between 2010 and 2016 the growth of the economy was characterised by a labour-intensive phase, where dynamic expansion in employment was accompanied by stagnating productivity. As a result of the tightening labour market, economic growth has become increasingly capital-intensive, and thus labour productivity also started to rise, but the level thereof still falls short of the regional average.
- The post-2010 economic policy reforms have set the Hungarian public debt on a decreasing path, which declined from 80.8 percent to 66.3 percent between 2011 and 2019. Net external debt also declined substantially, close to the average of region, which considerably contributed to the decrease in Hungary's external financial vulnerability.

New financial model

- The financial deepening of the private sector still significantly lags behind the regional and EU average; however, from 2017 the volume of lending to corporate sector, while from 2019 the volume of lending to households, grew at a remarkable rate and in a sound structure also by international standards, which was also supported by the central bank's macroprudential regulation and targeted programmes (e.g. introduction of FGS Fix or the Certified Consumer-friendly Housing Loan) and by the government's programmes, such as the Home Purchase Subsidy for Families and the Prenatal Baby Support Loan.
- As regards the ratio of small and medium-sized enterprises facing financing constraints, Hungary reached the average of the V3 countries; however, the productive corporate allocation of capital can be improved further by the diversification of financial channels (further development of the bond and equity market), strengthening of digitalisation and the enhancement of the efficiency of the institutional guarantee scheme.

- The elimination of the legacies of the previous crisis, representing systemic risks (the households' foreign currency denominated loans, high NPL ratio) after 2010 and the favourable economic environment have provided the financial sector with stable and high profitability for many years. However, this may only be maintained in the long run by improving efficiency, which may also facilitate the lowering of higher pricing, observed primarily in the household segment. The reduction of the operating expenses at sector level may be fostered by institutional consolidation, the deepening of financial penetration and the spread of bank digitalisation to a larger degree.

Activation of household savings

- For the continuation of economic convergence, which ensures the maintenance of financial balance, it is essential to keep household savings at a high level, in which the success of the Hungarian Government Securities Plus (MÁP Plus) has a key role. By reducing external financing and strengthening self-financing, the MÁP Plusz reduces Hungary's external vulnerability and improves its financing conditions.

SME strategy

- Between 2010 and 2018 the labour productivity of Hungarian SMEs rose by almost 30 percent, which is roughly twice as high as the average of the – also fast growing – Visegrád region, and the quadruple of the EU average.
- As a result of the fast development of the SME sector observed in recent years, duality – i.e. the lag of smaller companies compared to large corporations – eased. The narrowing of the gap was supported by several government measures (e.g. introduction of the simplified preferential small enterprise taxes, cuts in the corporate income tax and major cut in the social contribution tax). Nevertheless, the lag of the SME sector is still substantial – both in terms of productivity and wages – which is contributed to by the fact that the Hungarian SME sector tends to underutilise advanced technologies (e.g. cloud-based technologies, Big Data, 3D printing, industrial robots).
- In the long run, the key challenges faced by the SME sector – in addition to the application of modern technologies – include economies of scale and the problem of the change of generations as well as the moderate willingness of young people to start a business.

External economy and economic structure

- The ratio of exporting SMEs (6.7 percent) in Hungary exceeds the average of the Visegrád region (4.6 percent). However, in Hungary the external trade concentration ratio is high. In Hungary the 20 largest companies account for almost 30 percent of the export performance, while in Czechia and Poland roughly half of the exports is concentrated to such a degree.
- Within manufacturing output, accounting for a large part of exports, Hungary's knowledge intensity substantially lags behind the EU average, which indicates that – similarly to the region – Hungarian companies only have access to the low value added phases of the global value chains. However, the dynamic growth in the ratio of the Hungarian services exports may have somewhat offset this, the rate of which as a percentage of GDP in 2019 (22.5 percent) already substantially exceeded the average of the Visegrád region (16.7 percent).

Labour market

- Owing to the economic policy targeting full employment, between 2010 and 2019 the number of people in employment rose by roughly 800,000 in Hungary. The employment rate reached 70 percent, which exceeds the EU average. Meanwhile, Hungary's unemployment rate fell to one of the lowest levels in the EU, to 3.5 percent.
- As a result of the favourable labour market processes, Hungary came close to full employment; however, still major labour market reserves can be identified within the economically inactive groups with less favourable labour market position.

- In recent years Hungarian average wage has substantially increased due to the tight labour market, the wage increases in the government sector and the increase in minimum wages. Nevertheless, Hungarian average wage – similarly to the region – still considerably lags behind the EU average; however, the Hungarian wage level is in line with productivity.

Regional and social convergence

- As regards the income and wealth inequalities, Hungary traditionally belongs to the countries of lower inequality both in a global comparison and in the European Union.
- The larger inflows of foreign direct investment, the presence of advanced business services and manufacturing, significantly contributed to the growth in the Hungarian counties' development in recent years. Nevertheless, there are still considerable differences by regions, and – similarly to Hungary's competitors in the region – the dominance of the capital is typical of Hungary as well. In 2018, the development level of Budapest was twice as high as the national average, while that of the majority of the counties is between 60 and 80 percent of the national average.
- As a result of the favourable trends of recent years, the territorial differences of the labour market decreased, but inequalities can still be experienced.

Family-friendly programme

- In Hungary, following the historic low of 1.2 recorded in 2011, the fertility rate rose significantly, close to 1.5 by 2018; however, this ratio still lags behind the value of 2.1, necessary for the reproduction of the population.
- In Hungary, life expectancy at birth rose from 74 to 76 years between 2008 and 2018, which nevertheless significantly lags behind the EU average (81 years) and also the values characterising the Visegrád countries (78 years).
- In addition to the decline in population, ageing also represents an increasing challenge. In Hungary, the ratio of the population over 65 years was 19 percent in 2019, which was slightly lower than the EU average, but exceeded the average value characterising the Visegrád countries.

Healthy society

- The health status of the Hungarian population lags behind that observed in the countries of similar development level in the region, which – in addition to the gradual ageing of the society – lays increasing burden on the health care system, struggling with numerous challenges. Although in 2018 in Hungary the healthy life years slightly exceeded the average of the V3 countries, it considerably fell short of the EU average.
- Hungary's health care expenditure as a percentage of GDP (6.9 percent) slightly exceeds the average of the other Visegrád (6.8 percent), but it fell short of the average of the EU Members States (8.3 percent) in 2017. Within the total expenditure the rate of the public expenditure is 69 percent in Hungary, which falls short of the EU and regional average (74 and 78 percent, respectively).
- One of the problems of the Hungarian health care system is that the private health care expenses are spent not through health funds or supplementary private health insurances. The supply of the sector with human resources also represents a challenge; particularly due to the low number of ancillary workers compared to the doctors, and the high average age of the doctors and ancillary workers.

Knowledge-based society

- International tests measuring the effectiveness of the educational system show that Hungarian students learn the curriculum as expected of them, at the same time, in the case of examples taken from real-life they are less able to use this knowledge to an adequate degree. The numeracy competence of the adult population exceeds the international average, while there is a lag in foreign language and financial skills.

- In 2016, Hungary spent 4.3 percent of GDP on education expenses, which exceeds the average of the other Visegrád countries (3.8 percent) by 0.5 percentage point and slightly falls short of the EU average (4.4 percent).
- In Hungary, the degree of early school leaving without qualification is almost twice as high as the average of the other Visegrád countries, while the ratio of those holding a tertiary education degree is one of the lowest among the EU countries. As regards participation in lifelong learning, Hungary is at the average level of the region (6 percent), while it has substantial lag compared the EU average (11 percent).

Research, development and innovation

- Hungary's innovation performance is below the EU average, but corresponds to the regional average. In Hungary, between 2008 and 2018 the R&D expenditure to GDP ratio rose from less than 1 percent over 1.5 percent, exceeding the average performance of the other Visegrád countries by 0.2 percentage point. Nevertheless, the degree of the expenditure still lags behind Hungary's own EU2020 target (1.8 percent) and the EU average (2.1 percent).
- The innovation capacity of the Hungarian SME sector is in the last quarter of the EU Member States, substantially lagging behind the EU average and moderately falling short of the average of the other Visegrád countries. The number of new patents registered annually is considerably lower than the EU and Visegrád average, which – under increasing research and development expenditures – implies inefficient utilisation of resources.
- In the field of digitalisation, it is primarily the development and spread of enterprise digital technologies as well as the spread of e-commerce solutions and an improvement in the quality and usage rate of e-governance that are necessary in Hungary.

Efficient governance

- In Hungary, the public administration wage cost to GDP ratio still exceeds the average of the European Union and of the V3 countries, which is attributable to the high ratio of those employed in public administration.
- In Hungary the rate of unpaid VAT fell drastically, from 22 to 9 percent between 2010 and 2018, which signals the reduction of the shadow economy and general improvement in the business environment. However, the continued reduction of the shadow economy calls for further measures.
- In order to improve the business environment, the willingness to establish companies and make investments, it is necessary to simplify public rules and reduce administrative burdens. The number of procedures required to obtain construction permits exceeds those in the EU by one third. The time spent by companies on tax administration is also high in Hungary, 277 hours per year, while the EU average is 172 hours.

Modern infrastructure and efficient energy use

- The density of the rail and road networks is adequate in Hungary, but the quality of those lags behind the EU average in many respects. The quality and penetration of the infocommunication infrastructure in Hungary is excellent. However, in recent years the price of broadband internet significantly rose and the vast majority of the Hungarian economic agents have no advanced information security solutions.
- Similarly to the region, in Hungary the ratio of the economy's energy use and the net energy imports is high, which increases Hungary's economic dependence. As a result of the regulatory interventions in the early 2010s, Hungarian energy prices declined to a moderate level for households. However, energy prices paid by corporations exceed the EU average. The ratio of the renewable energy resources is on a declining path since 2014 in Hungary, the increasing of which, however, would be able to improve Hungary's energy mix as well as the foreign trade balance of the economy substantially.
- Hungary has the 4th lowest carbon dioxide emission per capita in the European Union. However, the degree of air pollution is relatively high, while the share of areas involved in agricultural irrigation is low.

2 Framework of the Competitiveness Report

2.1 PURPOSE OF THE COMPETITIVENESS REPORT

Since 2013, the Magyar Nemzeti Bank – in line with its statutory authorisation – performs its work with a broader horizon than before, with the analysis of competitiveness also forming part of it. In addition to the primary mandate, i.e. achieving and maintaining price stability and ensuring financial stability, it is also the statutory duty of the central bank to support the government's economic policy with the instruments available to it. In recent years, Hungary's economy has set on a successful convergence path. However, for the long-term maintenance of this, it still must be ensured that Hungary's growth surplus compared to the developed countries is at least 2-3 percentage points in the long run.

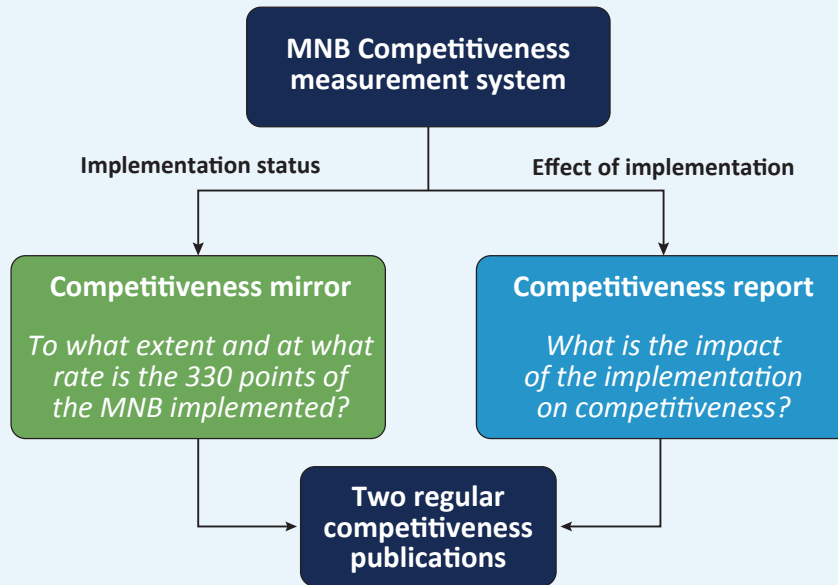
Based on the MNB's analysis, the realisation of the turn in competitiveness is an essential condition of sustainable convergence. The MNB has already made proposals in several of its publications regarding the measures to be implemented to ensure tangible improvement in Hungary's competitiveness. The monograph entitled *Competitiveness and Growth*, published in 2016, contained 50 proposals. Afterwards, in the summer of 2018, the MNB submitted its new workshop paper, already containing 180 proposals, to the National Competitiveness Council. As the next step of the work performed in the area of competitiveness, the *Competitiveness Programme*, containing 330 points, was published in February 2019, which – building on the results of the previous publications – formulated proposals in 12 areas.

The MNB's competitiveness backtesting system assesses the progress of the turn in competitiveness by two publications, issued annually (Chart 2.1):

- The *Competitiveness Mirror*, which was first published in 2019, assesses what part of the 330 competitiveness proposals, put forward by the MNB, has been realised. The publication monitors the proposals made in the areas assessed in the *Competitiveness Programme* and presents the measures taken.
- The *Competitiveness Report* presents the most important competitiveness indices. This publication was first issued in 2017 and examined more than 100 indicators essential in structural terms. The *Competitiveness Report* strives to present Hungary's competitiveness position in a European comparison, building on objective indicators to the largest possible degree. It is the key objective of the *Competitiveness Report* to present in which factors and indicators determining competitiveness Hungary managed to improve in the past years and in which areas it lags behind its regional and EU competitors.

The purpose of the Competitiveness Report of the MNB is to provide a comprehensive and objective picture of Hungary's competitiveness. The publication also includes a detailed examination of dimensions that are less in the focus of the central bank's traditional macroeconomic analyses, although they are key factors in terms of – the primarily longer-term – economic trends. These fundamentally structural areas and factors influence the economic agents' consumption, savings and investment decisions, the financial balance, the potential economic growth and, through all of these, the expected yields and price level as well as inflation. Our analysis is built on data from 2019, and accordingly, it does not reflect the impact of the coronavirus pandemic felt all over the world, affecting economic processes and other areas of everyday life alike.

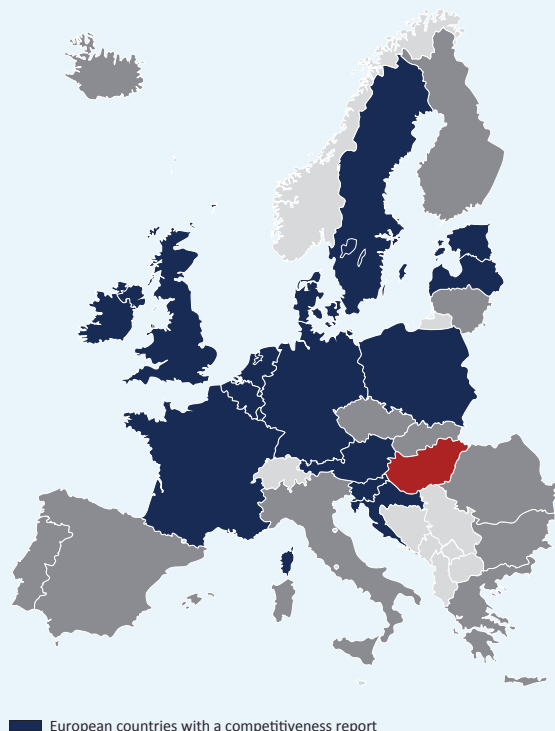
Chart 2.1
Components of the MNB's Competitiveness measurement system



Source: MNB.

The MNB's competitiveness analyses are extensive and complex, even by international standards. Although in the European Union numerous countries prepare some sort of national competitiveness report on the condition of their economy (Chart 2.2), in most of the cases these focus on macroeconomic indicators (except for Ireland and Latvia). Furthermore, international competitiveness reports essentially focus only on the indicators rather than performing analyses. Finally, certain international organisations (e.g. OECD, IMF, European Commission), in addition to the analysis of the situation, also make recommendations in relation to the functioning of the respective countries, and in some instances they also monitor the implementation of such recommendations.

Chart 2.2
EU Member States preparing competitiveness reports

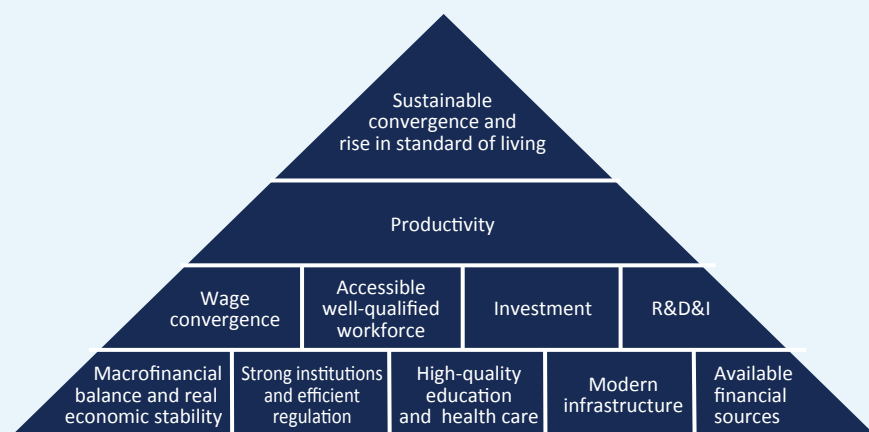


Source: MNB collection.

Methodology of the MNB's Competitiveness Report

According to the MNB's approach, a national economy is competitive if it utilises its available resources optimally to attain the highest possible, but at the same time sustainable, level of welfare. However, as there is no single, universal recipe for successful economic convergence, competitiveness also does not have a general, precise definition uniformly accepted by everybody. In some countries, improvement in competitiveness entails faster growth in the real economy. At the same time, elsewhere it tends to rather result in the maintenance of the leading role in the global economy and improvement in qualitative factors (quality of life, social and environmental sustainability). However, there is a consensus on the necessary and advantageous nature of part of the essential factors (Chart 2.3). Solid foundations – such as the stable macroeconomy and financial sector, efficient functioning of the state, infrastructure of adequate quality, favourable demographic trends, strong domestic corporate sector, flexible labour market and high-quality education and health care – are essential for competitive economic operation. Relying on these allows the creation of a well-functioning and predictable business environment, which stimulates investments and innovation, which may lead to an increase in productivity and lasting economic convergence by honouring qualified labour.

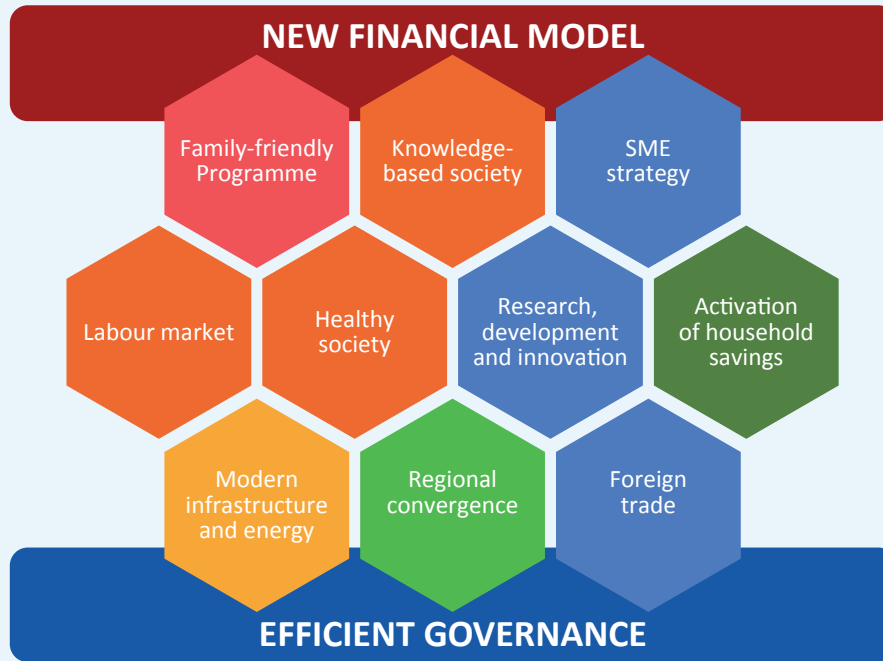
Chart 2.3
Stylised structure, foundations and objectives of competitiveness



Source: MNB.

The *Competitiveness Report* – in a structure similar to the *Competitiveness Programme* – examines Hungary's competitiveness position in an international comparison in 12 areas (Chart 2.4), which is supplemented by a section summarising macroeconomic developments. The *Competitiveness Report* presents in which areas progress has been achieved compared to the status described in the *Competitiveness Programme*. The change and the shift in the Hungarian competitiveness factors compared to their previous status are at least of the same importance as the assessment of the position compared to our international competitors. The MNB deems it essential not only to summarise the results of the development, but also to highlight the areas in need of improvement in an objective manner. Similarly to the 2017 Competitiveness Report, the focus of the publication is on Hungary, compared with the countries of the European Union and particularly with the Visegrád countries. The MNB's competitiveness measurement scheme was presented in detail in the publication entitled *Methodology for Measuring Competitiveness* published in 2019.

Chart 2.4
Areas covered by the Competitiveness Report



Source: MNB.

2.2 BRIEF SUMMARY OF HUNGARY'S COMPETITIVENESS POSITION

In the past decade the macroeconomic fundamentals, necessary for the turn in competitiveness, have developed successfully in Hungary. From 2010, the budgetary and from 2013, the monetary policy turn created the conditions for balanced growth. Owing to this, between 2013 and 2019, Hungarian economic growth exceeded the average of the European Union continuously, by 2 percentage points on average, and thus Hungary has set on the path of economic convergence. However, persistently successful convergence is also conditional upon a turn in competitiveness. Below we summarise the key results realised in the 12 areas under review.

The stability, lending activity and profitability of the banking sector grew, while the capital market diversified and the increasing of the holding of domestic households within the public debt continued successfully. Following the crisis, by autumn 2019, the non-performing loan ratio fell below 5 percent, the level also deemed desirable by the MNB, while the capital adequacy of the banking sector rose further. Outstanding lending grew from 2017 at an exceptional rate even by international standards; however, this is in line with the economic fundamentals. The loss-making period broke in the banking sector in 2016, and since then Hungary's banking sector is in the vanguard of the EU in the return on equity ranking. The stability of the financial sector was supported by the growth in the ratio of fixed-interest loans; following the introduction of the consumer-friendly housing loans, variable rate loans – which at the beginning of 2016 accounted for 40 percent of the outstanding loans – practically ceased. The favourable trends in the financial sector also improved the stability of the country; besides, the strengthening of domestic financing substantially reduced the vulnerability of Hungary. As a result of the gradual spread of household government securities, the – direct and indirect – share of households within the public debt rose from 10 percent registered in 2011 to 35 percent by 2019. The experiences of the introduction of MÁP+ (Hungarian Government Securities Plus) project the continuation of the already commenced trend; following its introduction in June 2019, the MÁP+ portfolio exceeded HUF 3,100 billion by the end of 2019. The

Bond Funding for Growth Scheme of the Magyar Nemzeti Bank successfully contributed to the diversification of the funding available to corporations, as it strengthened the formerly practically inexistent bond market. The Budapest Stock Exchange came under Hungarian ownership once again in 2015, which provides greater room for the development of the domestic capital market and for increasing the number of successful admissions for listing. Despite the achieved results, the moderate role of the alternative financing channels and the low financial involvement of certain social groups may be still regarded as shortcomings of domestic financial intermediation; also, there is still substantial room for improvement in the area of digitalisation.

The productivity of small and medium-sized enterprises, key to Hungary's convergence in terms of the economy, rose more than the average of the EU and the Central and Eastern European region. Between 2010 and 2018, the productivity of small and medium-sized enterprises rose by roughly 30 percent. The more favourable lending conditions, the reduction of corporate taxes, the central bank's Funding for Growth Scheme, the absorption of EU funds and the second-round effect of the inflow of foreign direct investments considerably contributed to the favourable trends unfolding in the sector. As a result of the fast development of the SMEs observed in the past two years, duality – i.e. the lag of smaller companies compared to large corporations – eased. Naturally, convergence to large corporations in terms of productivity and wages takes place only gradually. One potential reason for this is that external trade is not yet the common practice of SMEs. Moreover, the innovation capacity of the Hungarian SME sector is in the last quarter of the ranking of EU Member States, substantially lagging behind the EU average and moderately falling short of the average of the other Visegrád countries. It is partly due to this that the innovation activity of the national economy as a whole and the number of patents also substantially fall short of the EU and Visegrád average.

Owing to the successful economic policy, Hungary practically achieved full employment. Since 2010, the number of people in employment rose by roughly 800,000, as a result of which the unemployment rate fell to 3.4 percent by the end of 2019. The Hungarian employment rate exceeds the EU average since 2017, and in 2019 it stood at 70.1 percent. Employment growth was accompanied in recent years by a gradual decline in labour market reserves, as a result of which the labour market has become increasingly tight. As a result of the tight labour market environment wages substantially increased and came closer to the EU average, but still considerably fall short of that. The Hungarian wage level is essentially in line with productivity. Despite the favourable trends of recent years, labour market reserves and regional inequalities may still be identified. As regards the income and wealth inequalities, Hungary traditionally belongs to the countries of lower inequality both in a global and EU comparison.

In the past period, favourable demographic trends were observed in Hungary. The fertility rate rose in 2016 to 1.5 from the historic low of 1.2 registered in 2011, while in each year between 2016 and 2019 it was around 1.5 percent. Thus the Hungarian index caught up with the regional and EU average, which may have also been contributed to by the generous family policy measures after 2010. It is a favourable recent development that based on the HCSO's data, since December 2019 the monthly birth rate exceeded the year-on-year value in each month, and the number of children born in the period of December 2019 – April 2020 outstripped the year-on-year value by 2,111. These favourable data may be associated with certain subsidy elements of the Family Protection Action Plan announced in February 2019. However, the fertility rate still falls short of 2.1, i.e. the value necessary for the reproduction of the population. In Hungary, the family allowance expenditure is high even in an international comparison. However, the labour market position of mothers after childbirth is more difficult than the EU average, since the penetration of atypical employment and the ratio of those participating in the education of young children are still low. In Hungary, life expectancy at birth rose by 2 years in the past ten years, which nevertheless significantly lags behind the EU average and also the values characterising the Visegrád countries. As regards the demographic trends – similarly to the European situation – in addition to the decline in the Hungarian population, ageing also represents an increasing challenge. In Hungary, the ratio of the population over 65 years was 19 percent in 2019, which was slightly lower than the EU average, but moderately exceeded the average value characterising the Visegrád countries.

The Hungarian population's health status lags behind that in the countries of similar development level in the region; however, as regards the healthy life years Hungary has caught up with the region. Efforts for a healthy lifestyle are not yet sufficiently present in the Hungarian population, which is also evidenced by the morbidity and mortality rates. In Hungary, health care expenditures as a percentage of GDP and the healthy life years were both slightly higher than the average of the V3 countries but fall short of the average level of EU. The ratio of expenditures from private funds is high within the health care expenditures. One of the problems of the Hungarian health care system is that the private health care expenses are spent not through health funds or supplementary private health insurances. The supply of the sector with human resources also represents a challenge, particularly due to the low number of ancillary workers compared to the doctors and the ageing of the doctors and ancillary workers.

International tests measuring the effectiveness of the educational system show that Hungarian students learn the curriculum as expected of them, at the same time, they are less able to use this knowledge in practice. Based on the latest PISA tests, which examine how students use the learnt curriculum in real life, the decreasing trend observed in previous years turned, and thus the average score of Hungarian students came closer to the EU average. In 2016, Hungary spent 4.3 percent of GDP on education expenses, which is slightly lower than the EU average (4.4 percent). However, financial remuneration for the teaching profession in Hungary lags behind – more substantially compared to the EU average and similarly to the level observed in the region – that for other occupations requiring tertiary education degree. In Hungary, early school leaving without obtaining any qualification is almost twice as high as the average of the other Visegrád countries. In the age group of 25-34 years, the ratio of tertiary education graduates was 31 percent in 2018, which corresponds to the level registered in 2012 and it is the third lowest value in the European Union. Based on the international rankings of tertiary education institutions, the Hungarian universities are not in the vanguard of the world, while the ratio of international students studying in the domestic tertiary education institutions exceeds the average of the EU. The numeracy competence of the adult population exceeds the international average, while there is a lag in comprehension, foreign language and financial skills.

In an EU comparison, Hungary's energy consumption and imports are high, which increase Hungary's dependence; however, in recent years, competitive digital infrastructure has been developed, which contributed to the reduction of tax evasion and facilitates the gradual development of electronic public administration. As a result of the introduction of the online cash register, the Electronic Public Road Trade Control System (EKAER), and the online invoicing, between 2010 and 2018 the ratio of unpaid VAT decreased to the second largest degree among the EU member states in Hungary, the rate of which was merely 9 percent in Hungary in 2018. The estimates related to the hidden economy also evidence a similar trend; however, the currently estimated ratio of 20 percent in Hungary still exceeds the EU average of 16 percent. Significant progress was made also in the area of infrastructure, but further measures are necessary. The density of the rail and road networks is adequate in Hungary, but the quality of those lags behind the EU average in many respects. The quality of the telecommunication infrastructure in Hungary is excellent; however, the price of the broadband internet considerably increased in recent years. The energy consumption of the Hungarian economy and the ratio of net energy imports are still high. The dynamic economic growth of recent years resulted in larger energy consumption, as a result of which the ratio of net energy imports rose by roughly 10 percentage points, and thus in 2018 it stood at 58 percent. The ratio of renewable energy resources follows a declining trend in Hungary since 2014, as a result of which Hungary lags behind the EU average and in 2018 it no longer achieved the EU target undertaken until 2020. Hungary has one of the lowest carbon dioxide emission per capita in the European Union; however, the degree of air pollution is high.

Table 1		
Improvement in certain competitiveness indicators between 2010 and 2019		
Indicator	2010	2019 or the latest
Annual GDP growth rate (percent)	0.7	4.9
Public debt-to-GDP ratio	80.6	66.3
Net external debt (in percent of GDP)	54.0	7.9
Households' net financial wealth (in percent of GDP)	70.0	108.6
Gross savings rate (in percent of GDP)	20.9	27.8
Investment rate (in percent of GDP)	20.2	28.6
Households' government securities holding (HUF billions)	727	8,043
Difference between GNI and GDP (in percent of GDP)	-4.6	-3.7
Return on equity of the banking sector (percent)*	12.6	15.5
Net non-performing loan portfolio as a percentage of the capital (percent)	49.7	2.5
Share of electronic payments of retail purchases (percent)	10.1	29.8
Ratio of internet bank users (percent)**	37.1	54.3
R&D expenditures (in percent of GDP)	1.1	1.5
Labour productivity of the SME sector (2010=100)	100.0	128,7
Total tax rate of corporations (percent)	52.4	37,9
Credit dynamics of the corporate sector (percent)	-2.5	14.0
Average tax wedge of families with two children and average wage (percent)	41.7	37.1
Employment rate in the 15–64 age group (percent)	54.9	70.1
Unemployment rate in the age group 15–64 (percent)	11.3	3.5
Monthly gross average earnings (HUF)	202,525	367,833
Ratio of the population exposed to the risks of poverty and social exclusion (percent)	29.9	18.9
Fertility rate (number of children per woman)	1.3	1.5
Healthy life years (years)	57.5	61.1
Unmet needs for medical examination (percent)	7.8	6.5
Ratio of cataract surgeries performed in same-day surgery and outpatient care (percent)	19.3	40.1
Ratio of international students in tertiary education (percent)	4.7	10.0
Participation in lifelong learning (percent)	3.0	5.8
Ratio of VAT evasion (percent)	22.0	9.0
Ratio of municipal waste recycling (percent)	19.6	37.4

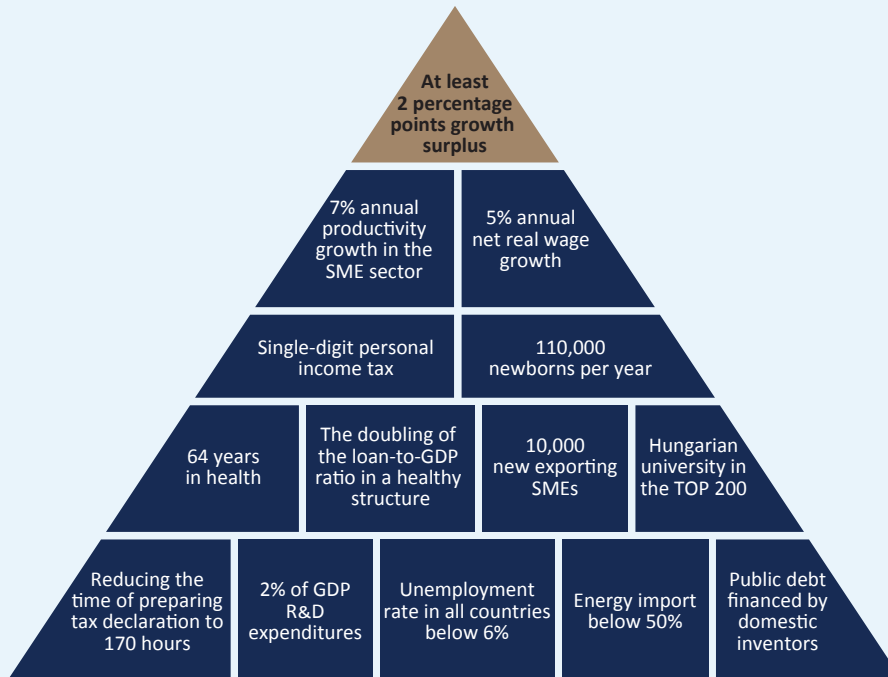
Note: * Three-year average. ** Data from 2014 instead of 2010.
Source: ÁKK (Government Debt Management Agency), DESI, ECB, European Commission, Eurostat, IMF, HCSO, MNB, OECD, World Bank-PWC.

2.3 NECESSARY DIRECTIONS OF PROGRESS

The purpose of the turn in competitiveness is to achieve that Hungary's economic growth exceeds the EU average persistently, by at least 2-3 percentage points, thereby continuing Hungary's sustainable convergence. In the case of economies of higher growth, the growth surplus compared to the developed regions usually runs out before they catch up with the advanced economies. The specialist literature refers to this phenomenon as the middle-income trap. The stake of the convergence process is whether Hungary is able to break out from the middle-income trap, which was achieved in the past one hundred years by hardly a dozen countries. Most of those are countries of the Far East (South Korea, Hong Kong, Singapore), while in Europe only Austria, Finland and Ireland managed to achieve this in the past good half a century. There is no single, universal recipe for sustainable convergence. On the other hand, there are certain features

that generally characterise the economies that achieve successful convergence. These include the turning of the focus of economic policy to efficiency and productivity, which is conditional upon the adaptation and enhancement of modern technologies and the availability of high-quality human resources. Another important feature is the growth in population, i.e. that the demographic trends support economic growth.

Chart 2.5
Key objectives of the central bank’s publication titled “Competitiveness Programme in 330 points”



Source: MNB.

In its previous publications, the central bank expounded in detail the conditions under which the growth surplus of 2-3 percentage points can be achieved in the long run and formulated 330 specific proposals in twelve areas to support the turn in competitiveness. The desirable growth surplus can be achieved through productivity growth, which may be followed by a real wage growth permanently exceeding five percent. The factors underlying productivity growth may include improvement in the small and medium-sized enterprises’ economies of scale, innovation capacity and export capability, the improvement of public digitalisation as well as the easing and diversification of access to financial resources. Further activation of households’ savings may contribute to the financing of both the corporate and public sectors. Economic convergence is feasible only with a growing population, therefore the objectives include the demographic turn, the increase in healthy life years and the improvement of the qualification of the labour force, which may also be supported by further decreasing the public dues burdening labour through the recognition of more qualified employees with a higher wage.

Sustainable economic growth necessitates efficient capital allocation, high household saving rate and increasing household demand for government securities and capital market investments. Economic growth is conditional upon the maintenance of financial stability and the more cost-efficient operation of the Hungarian financial intermediary system – being the most expensive one in the EU based on the operating expenses to assets ratio (3.2 percent in September 2019) – and its operation that supports growth better. At the end of 2019, the outstanding borrowing of the private sector was 32.5 percent of GDP, which falls short of the V3 and EU average by 22 and 51 percentage points, respectively. The doubling of the loans outstanding as a share of GDP may be achieved – in addition to the improvement of digitalisation – through funding which is cheaper than currently and available in a standardised framework. In addition to bank loans,

alternative forms of financing and the corporate bond market must also gain ground. For many corporations stable financing may be represented by a sufficiently diversified capital market, while the development of the corporate bond market is supported by the MNB's Bond Funding for Growth Scheme. As regards the activation of household savings the objective is that households spend a larger portion of their recently accumulated savings for the purchase of government securities and that domestic investors play a more prominent role in the capital market.

The focus of the central bank's SME strategy is on increasing the sector's productivity, expanding its innovation capacities and increasing the number of exporting small and medium-sized enterprises and enhancing their role in services exports. The productivity of Hungarian SMEs is below 60 percent of the productivity of large corporations. Accordingly, the fostering of acquisitions and mergers in the SME sector, the reduction of the enterprises' administrative burdens and the simplification of the liquidation procedures would facilitate better utilisation of the advantages stemming from the economies of scale. The investment to GDP ratio of Hungarian corporations was 15 percent in 2018, which exceeds the EU and V3 average by two percentage points. Providing additional corporate tax allowance for investment may support the maintenance and increasing of the high investment activity. Efficiency may be increased by the application of innovative solutions in production; however, merely one-fifth of Hungarian corporations innovate. In addition to establishing non-profit advisory centres, providing financial assistance for the digitalisation of SMEs and developing clusters may support the progress of an innovative entrepreneurial ecosystem. In 2018, R&D expenditures amounted to 1.5 percent of the GDP; the central bank aims to increase this ratio to 2 percent. Providing special grants for the R&D expenditures of enterprises in the early phase of their lifecycle, conditional reduction of employers' contribution for SMEs making R&D investments and the lowering of the patent maintenance fees may result in the broadening of the business sector's researches. Less than 40 percent of the Hungarian SMEs export and the ratio of services exports (22 percent) lags behind the EU average (29 percent). An increase in the number of exporting SMEs and in the intensity of their external trade activity may be fostered by the strengthening of services exports and taking advantage of the benefits of the Belt and Road Initiative. The domestic value added within exports could be primarily increased by focusing the investment grants on knowledge-intensive sectors and increasing the number of Hungarian suppliers among the corporations benefiting from priority aid.

As regards the domestic labour market, areas of high importance include more efficient utilisation of hidden reserves, sustainable increase of wages, strengthening of tertiary and further education and reducing territorial inequalities. As a result of the successful economic policy, Hungary came close to full employment; nevertheless, there are still labour market reserves among the economically inactive, the unemployed, the public workers and Hungarian citizens living abroad. Even though the average real wage rose by almost 50 percent since 2013, it still considerably falls short of the EU average. Wage convergence in parallel with productivity growth may be fostered by the further reduction of public dues burdening labour. In 2019, merely 4 percent of the labour force worked under a teleworking arrangement, while this ratio was 19 percent in the EU. The spread of atypical forms of employment may support the employment of persons more loosely attached to the labour market, while enticing Hungarian citizens living abroad to return to Hungary may be possible by raising wages for in-demand professions and recruiting abroad. In addition, to ensure the continuous improvement of labour force, efforts should be made to develop tertiary education and training institutions. In order to mitigate territorial inequalities, the goal is to reduce the counties' unemployment rate below 6 percent everywhere. This objective can be accomplished, among other things, by encouraging the mobility of labour force and supporting developments built on local resources.

Sustainable convergence is unfeasible with decreasing working age population, and accordingly, it is necessary to increase the fertility rate and enhance the family support scheme assisting this. The fertility rate, which rose from 1.2 to 1.5 in recent years, has not yet reached the value of 2.1, necessary for reproduction; accordingly, it is needed to increase the efficiency of the government's family policy measures that already support the growth of the ratio. It should be borne in mind that the different incentives may foster more efficiently the birth of the first, second and third child. The delivery of the first child is primarily fostered by supporting the return of the mother to the labour market and providing assistance in everyday life (spread of atypical forms of employment, increasing the number of nursery places, development of family-friendly work environment, harmonising the public education day care with the working time), while the birth of the second and particularly of the third child may be fostered by financial incentives (tax allowances and tax exemptions). Furthermore, the recognition of child raising in the pension scheme would also stimulate a demographic turn, which would make the scheme more sustainable and equitable.

The health status of the Hungarian population represents efficiency, productivity and growth reserve for the economy, which may be improved through prevention, the strengthening of health awareness and making the health institution system more efficient. Although in the past ten years Hungary caught up with the region (59 years) in the area of healthy life years (60 years), it lags behind the EU average (64 years) by four years. The growth in healthy life years and thereby the sustainability of the health care system would be supported the most by increasing the population's health awareness and putting greater emphasis on prevention in the health care system. In addition to the healthy lifestyle, the regular condition checks and screening tests, as well as the further strengthening of the family doctor system, may support the early diagnosis of diseases. We consider it essential that health policy focus on long-term, system-level cost-effectiveness. In 2017, the bed occupancy rate was 66 percent, which falls short of the regional and the EU average by three and eight percentage points. The public health care system has efficiency reserves in several areas (bed occupancy rate, same-day treatments), the utilisation of which may be assisted by the strengthening of professional and financial control. In contrast, within the private health expenditures the ratio of expenditures spent through institutional channels (health fund, health insurance) should be significantly increased. The latter may be supported by the set-up of a uniform supplementary voluntary pension and health fund scheme (Voluntary Welfare Funds), available based on subjective right, aiming at higher penetration.

The availability of highly qualified labour force is essential for increasing the productivity of the economy, which may be supported by the strengthening of the basic skills and vocational training, the improvement of the international recognition of tertiary education institutions and increasing the ratio of people with a tertiary education degree. One of the main challenges for the education system is to prepare the young for a future state of the labour market that is increasingly difficult to predict because of the accelerating development. The challenges of modern ages can only be met through ongoing (self-)development and lifelong learning. The Hungarian results of the PISA test in 2018 lag behind the EU and regional average, therefore the education system should focus in the future – in addition to providing the encyclopaedic basic knowledge – on the mastering of the appropriate basic skills (particularly IT and foreign language skills) and financial literacy and provide students with the urge to and the capability of learning to implement upskilling successfully and further education in the future. Also, it would be necessary to ensure that the education system reduces the differences resulting from the social and economic background of students more efficiently than at present, and decrease the high rate (12.5 percent) of school leaving without qualification, which is roughly twice as high in Hungary as in the region. The employment rate and wage of employees with a higher level of education exceed the similar data of those with a lower level of education (bachelor's degree holders and master's degree holders can earn more than one a half times more and twice as much, respectively, as those with secondary school qualification). Accordingly, in addition to enhancing vocational training and tertiary education in line with the labour market demands, it would be expedient to increase the ratio of tertiary education graduates (31 percent) – particularly of natural science graduates –, which currently falls short of the EU average by nine percentage points. The improvement of the quality of the tertiary education institutions can be also measured by the fact whether or not any Hungarian university is ranked among the world's Top 200 tertiary education institutions.

In addition to the fostering of the digitalisation of public administration and the further reduction of the shadow economy, the public sector may contribute to the turn in competitiveness by providing modern infrastructure, encouraging the reduction of energy use and by the strengthening of the green and carbon-neutral economy. The operation of the state administration may be made more efficient, in addition to the efficient utilisation of expenditures, by reducing the administrative burdens and digitalising public administration. The roughly 40 percent ratio of public administration transactions via the internet corresponds to the EU average, but there is still room for improvement. Combating tax evasion and hidden economy may also contribute to sustainable convergence through several channels; accordingly, it would be worth continuing and expanding the measures aimed at the reduction of the shadow economy, commenced after 2010. This process may be supported by the continued fostering of the electronic payment methods, such as prescribing the acceptance of electronic payment on a mandatory basis for enterprises obliged to use online cash registers from 1 January 2021, the introduction of which was also proposed earlier by the MNB. The measure may increase the utilisation of instant payment infrastructure with new retail acceptance services, thereby supporting not only the wide-ranging use of more transparent electronic payment methods but also innovation. In addition to strengthening the efficiency of the state, modern infrastructure reduces transport costs, attracts investments that enhance the economic growth and assists the mobility of the physical and human capital within the country. Creating a more competitive infrastructure calls for improvement in the quality of rail and road transport, and the spread of technologies complying

with the fourth industrial revolution, such as the 5G mobile internet and information security solutions. Furthermore, by developing an energy mix built on renewable energy resources and on nuclear energy, and by fostering the efficiency of corporate and household energy consumption, the state may reduce the ratio of net energy imports – amounting in 2018 to 58 percent and exceeding the regional average by 10 percentage points – and thereby the energy dependency of the country, and may contribute to the maintenance of the trade surplus. The realisation of a carbon-neutral economy calls for the strengthening of the green and circular economy, which – in addition to the SMEs’ environmental investments and the spread of electric vehicles – may be supported by increasing the recycling rate of municipal waste, which at present stands at 37 percent and falls short of the EU average by 10 percentage points.

2.4 MNB COMPETITIVENESS INDEX 2020

2.4.1 Methodology of the MNB’s Competitiveness Index

The MNB’s Competitiveness Report also assesses Hungary’s competitive position in an international comparison with the use of a composite index. The Competitiveness Report provides an objective and comprehensive view of Hungary’s performance, relying on more than 150 charts and detailed analyses related to the charts. At the same time, the summaries of the individual areas try to identify the correlations between the individual indicators and the relevance of those. However, the ranking of the countries’ performance calls for the creation of a composite index from the indicators used in the analysis. The MNB’s Competitiveness Index facilitates the presentation of a comprehensive picture, which takes into consideration the results of the 12 competitiveness areas with the same weight and is essentially based on objective indicators, which substantially eases the interpretation of the results. However, it should be emphasised that the composite index supplements rather than substitutes the detailed analysis of the data.

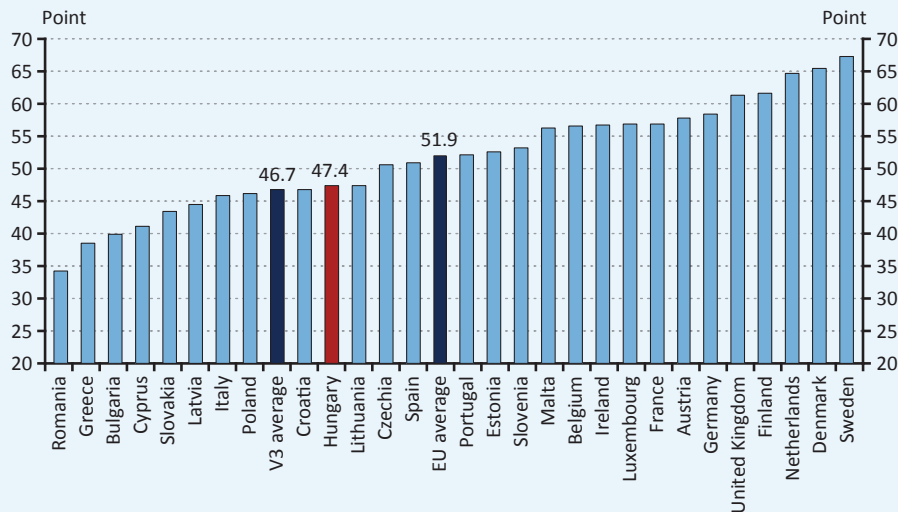
When creating the Competitiveness Index, the MNB used its independent methodology developed and used for the Banking Sector Competitiveness Index. The scoring scales the performance of the individual countries between 0 and 100 points, where the best performing country receives 100 points, while the score of the other countries depends on the standard deviation they are from the best score. As regards the results presented below, for the country being one standard deviation far from the best value, 25 “penalty points” are deducted from the maximum 100 points, that is, the countries being 4 or more standard deviations further from the best score receive 0 point. The methodology may be deemed robust considering the degree of the “penalty point” connected to the standard deviation. The advantage of the methodology is that it does not prescribe the normal distribution of the data and it permits that the optimal value varies by indicator, i.e. it can be decided for each indicator whether the minimum, maximum or even the average value of that can be deemed optimal. When calculating the Index, all charts in Section 4, which also can be interpreted in an international comparison, were included with the same weight, and thus if a chart includes several indicators these indicators received proportionately lower weight during the calculation. The score of the individual topics is the arithmetic mean of the indicators included in them, while the aggregated score of the Competitiveness Index is the arithmetic mean of the 12 areas under review taken into consideration with the same weight. The methodology elaborated by Asztalos et al. (2017)¹ is transparent and easy to reproduce, but the results obtained depend on the range of factors taken into consideration and the quality of the indicators used.

2.4.2 Results of the MNB’s 2020 Competitiveness Index

In 2020, Hungary was ranked 19th in the MNB’s competitiveness ranking among the European Union Member States (Chart 2.6). Hungary scored 47.4 points, which slightly exceeds the average of the other Visegrád countries (46.7), but lags behind the EU average by 4.5 points. The ranking is led by the Scandinavian countries and the Netherlands, while Romania, Greece and Bulgaria are at the end of the list. The first half of the Competitiveness Index includes the developed Western and Northern European countries, while the Mediterranean countries tend to be in the mid-range. In Central and Eastern Europe, Slovenia (53.1 points) and Estonia (52.5 points) reached the highest score, while the result of the other countries in the region falls short of the EU average. Sweden, the country that performed the best, scored 67.3 points of the possible 100, i.e. there is still room in all countries for the strengthening of competitiveness.

¹ P. Asztalos, G. Horváth, Š. Krakovský, T. Tóth (2017): Resolving Conflicts in Measuring Banking System Competitiveness – MNB Banking System Competitiveness index, Financial and Economic Review, Vol. 16, Issue 3

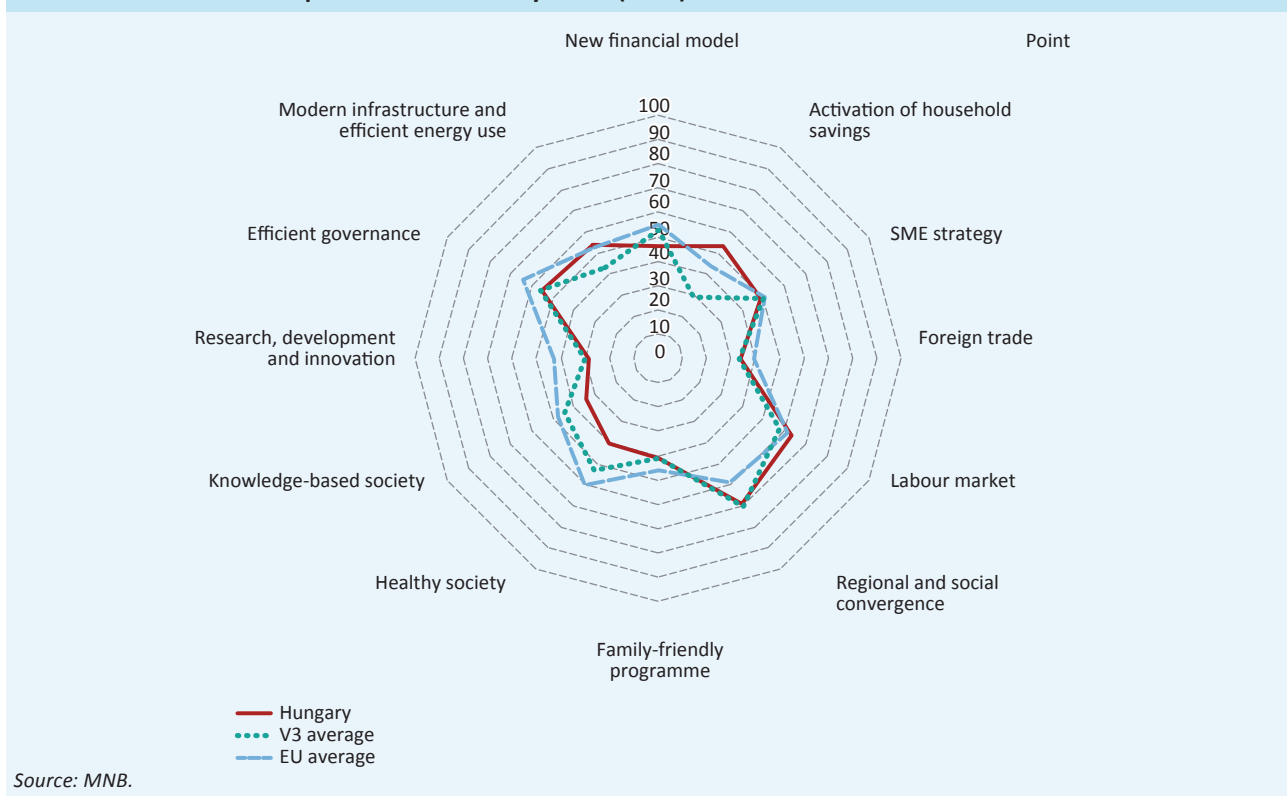
Chart 2.6
Aggregated results of the MNB's Competitiveness Index (2020)



Source: MNB.

Hungary achieved a higher score than the EU countries and the other Visegrád countries in the area of *Activation of household savings, Labour market and Modern infrastructure and efficient energy use (Chart 2.7)*. In the *Regional and social convergence* chapter, the score of each Visegrád country exceeds the EU average, while the Hungarian results are moderately lower than the average of the countries of the region. In the *External economy and economic structure* chapter, Hungary's result exceeded the regional average but fell short of the EU average. In the remaining seven chapters the Hungarian scores became lower than the regional and the EU average. Relatively larger lag can be identified in the *Healthy society and Knowledge-based society* chapters, presenting the quality of human capital, and in the area of *Research, development and innovation*, although in the case of the latter Hungary's performance corresponded to the regional level. Hungary achieved the best ranking in the *Activation of household savings* and the *Regional and social convergence* chapter, ranked 7th in both, while its worse ranking was in the *Healthy society* chapter (27th rank). When interpreting the results of the individual areas, it is worth taking into consideration that the higher average scores show that the countries under review are relatively close to the best performing countries, while the lower scores imply larger deviation in the respective area. For example, in the *State efficiency* chapter, the EU average for the indicators taken into consideration became 64 points, that is the countries are on average within one and a half standard deviation from the most successful country. By contrast, in the *External economy and economic structure* chapter, the EU average became merely 40 points, i.e. here the differences between the best performing and the rest of the countries are much larger.

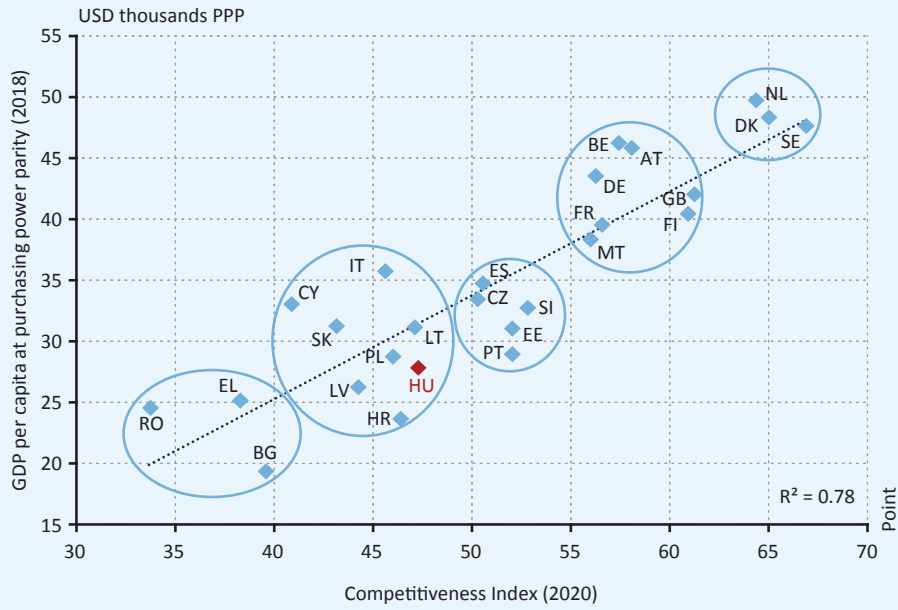
Chart 2.7
Results of the MNB's Competitiveness Index by areas (2020)



There is a strong correlation between the ranking in the MNB's Competitiveness Index and the countries' economic development (Chart 2.8). The EU countries may be broken down into five, relatively distinct groups based on their competitiveness position and GDP per capita measured at purchasing power parity. The top players included the three best performing countries in the area of competitiveness (Sweden, the Netherlands and Denmark), which are also in the vanguard in the ranking based on GDP per capita. Those developed Western European countries follow them (Austria, Belgium, Germany, United Kingdom, Finland, France and Malta), whose competitiveness score and economic development both lag behind the "top players", but still show good result in both dimensions. The next two groups are mixtures of converging countries and countries falling behind, the competitiveness of which is similar, but the dynamics thereof is just the opposite. The competitiveness of Spain, Czechia, Slovenia, Estonia and Portugal is slightly higher, followed by Italy, Cyprus, Slovakia, Lithuania, Poland, Hungary, Latvia and Croatia with a lag of a few points. The three countries belonging to the last group (Greece, Romania and Bulgaria) are already in need of major competitiveness measures even to catch up with the better performing countries in the region.

Hungary is slightly below the trend line of the EU countries' results, that is its economic development is moderately lower than its competitiveness position. A shift along the trend line – that is the simultaneous improvement of the economic development and competitiveness position – constitutes the realisation of sustainable convergence, the objective set by the MNB in its Competitiveness Programme. Accordingly, to achieve this, it is not sufficient to enhance economic performance, but the realisation of a turn in competitiveness in parallel with that is also essential. Furthermore, it is worth noting that although the results presented here do not allege anything about the causality link of the two indicators under review, it can be stated that according to the current calculation a one point rise in the score of the Competitiveness Index may entail a growth of roughly USD 860 in the GDP per capita.

Chart 2.8
The relationship between the MNB's Competitiveness Index and economic development



Note: In the case of Ireland and Luxembourg, the GDP per capita values are outliers, and thus they are not indicated in the chart.

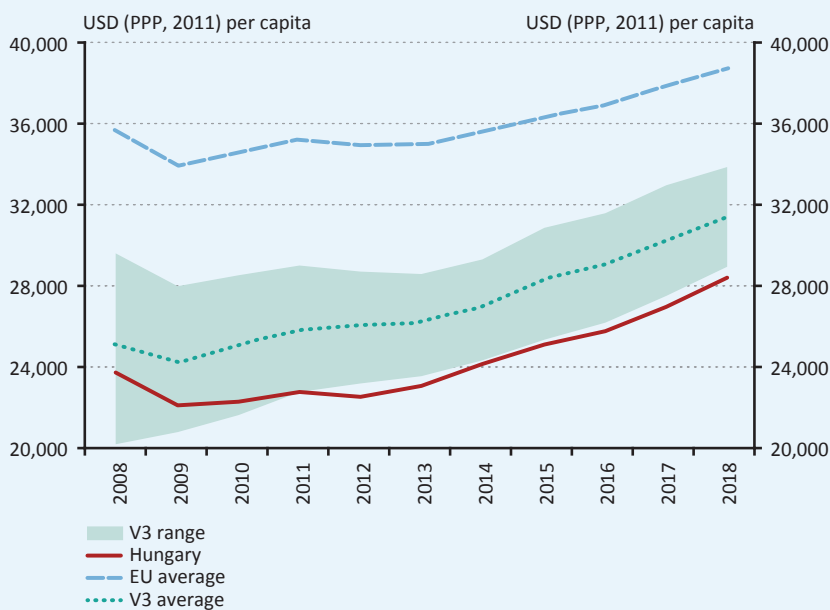
Source: WDI, MNB.

3 Situation of the macro economy and results of the competitiveness rankings

3.1 HUNGARIAN MACROECONOMIC ENVIRONMENT

In terms of macroeconomic indicators, the competitiveness of the Hungarian economy improved significantly in the past years, but lags can be identified in the case of several variables. The economic development of Hungary already departed from the regional trends prior to the crisis. During the years of the crisis – due to the high indebtedness resulting from the erroneous economic policy between 2002 and 2010 and the bad crisis management – the decline observed in economic development exceeded that in the Visegrád countries. During the years of the lengthy recovery from the crisis, Hungary’s relative development showed no essential change; by 2012, Hungary’s maturity was below that of all three countries of the Visegrád region. However, the results of the fiscal and economic stabilisation after 2010 were also reflected in the acceleration of economic growth from 2013 and the recovery of macro-financial balance. As a result of a turn in growth, Hungary’s relative fall behind the Visegrád region stopped and the process of balanced convergence to the European Union average commenced (Chart 3.1).

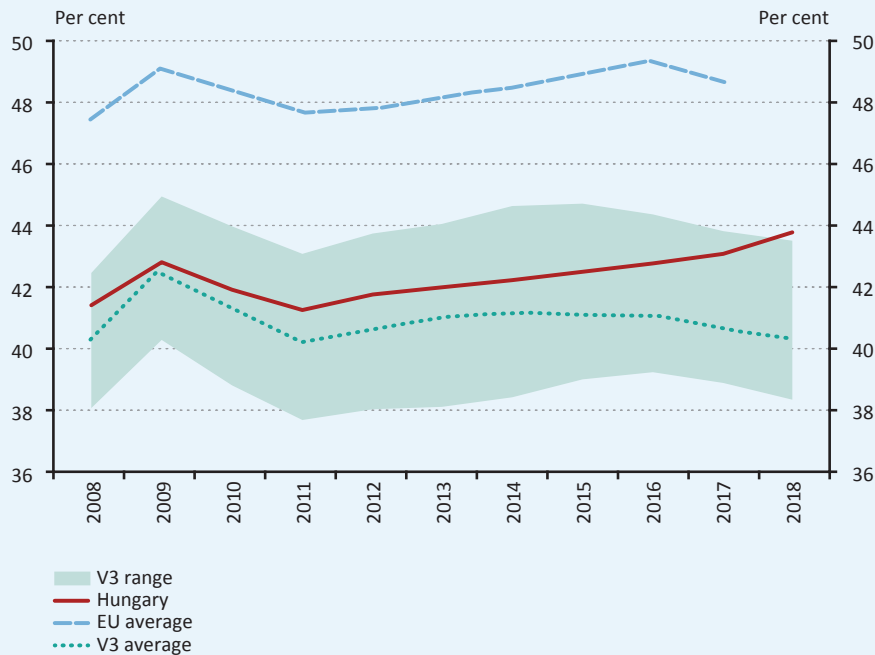
Chart 3.1
Development of GDP per capita



Source: WDI.

One of the significant indicators of the economies’ value-creating capacity is the produced value added to output ratio, since the higher the value added on one unit of output, the greater the economic growth’s value-creating capacity. This ratio started to rise in Hungary from 2011. After 2017, the domestic growth dynamics exceeded the average of the countries of the region and also of the European Union, which was primarily contributed to by the rise in value added characterising the service sector and construction. As regards the level of the ratio, Hungary has a prominent position in the region, but it falls short of the European Union’s average (Chart 3.2). As opposed to assembling, processes with higher value added are related to the services prior to and following manufacturing (R&D, marketing, etc.). However, the foreign direct investments in the countries of the region typically outsourced manufacturing and kept the activities of higher value added in the parent country. As a result of this, the production structure of the countries of the region was based in the past decades on production of high value added to a lesser degree.

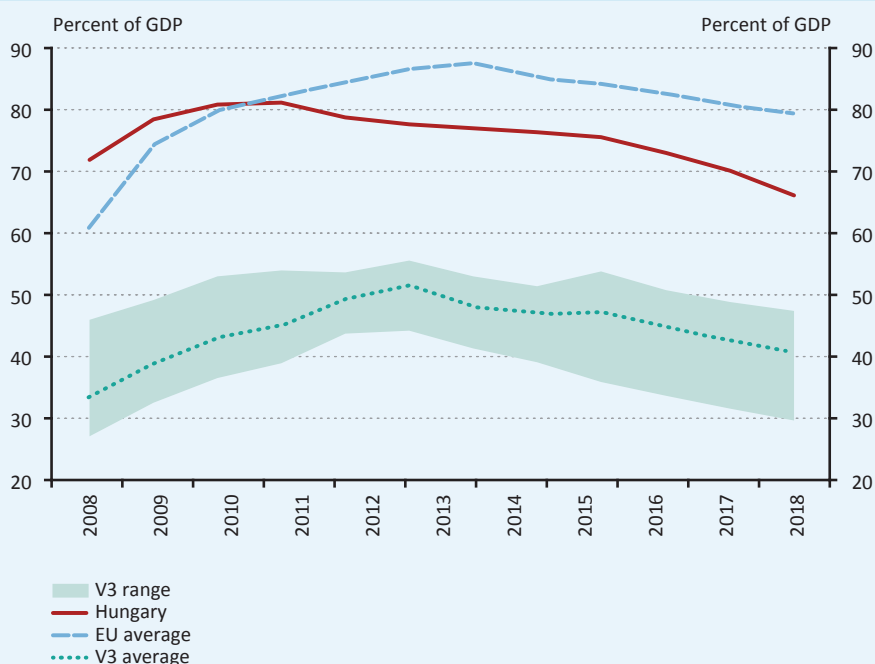
Chart 3.2
Value added as a proportion of production value



Source: Eurostat.

The post-2010 economic policy reforms stabilised the budget and the real economy and set Hungary's indebtedness rate on a declining path. Hungary's debt ratio has been continuously declining since 2011, and thus it fell from 80.8 percent to 66.3 percent, which is already lower than the average of the EU countries. In addition to the level of public debt, the structure of it is also an essential financial vulnerability factor. Owing to the post-2011 conscious debt strategy, aimed at increasing the domestic investor base, the ratio of non-resident holding declined within public debt (from 65.7 to 34.7 percent) along with a decrease in the foreign currency ratio of the central budget's debt (from 49.7 to 17.3 percent), contributing to the decline in external financial vulnerability.

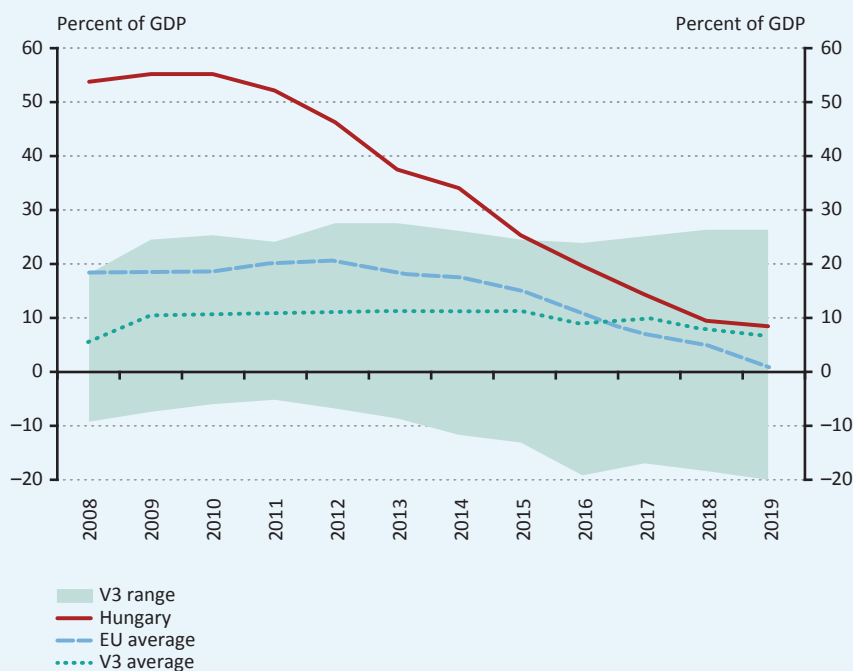
Chart 3.3
Public debt-to-GDP ratio (%)



Source: Eurostat.

As regards the external debt ratios, Hungary achieved major improvement in the past decade and caught up with the region. At the outbreak of the crisis, Hungary's net external debt, and thus its external financial vulnerability, was extremely high. Since 2010, owing to the adjustment process of the domestic sectors, the current account turned into a surplus, and the high net lending facilitated a continuous and substantial reduction of external debt. By 2019, the net external debt of the Hungarian economy fell to a historic low, close to the regional and EU average. Thus, in terms of the external debt ratios, Hungary worked off its major competitive disadvantage compared to the Visegrád region. The favourable financing trends observed in recent years contributed to the reduction of vulnerability, which also fostered improvement in perceptions about Hungary's risk, decrease in premiums and improvement in competitiveness.

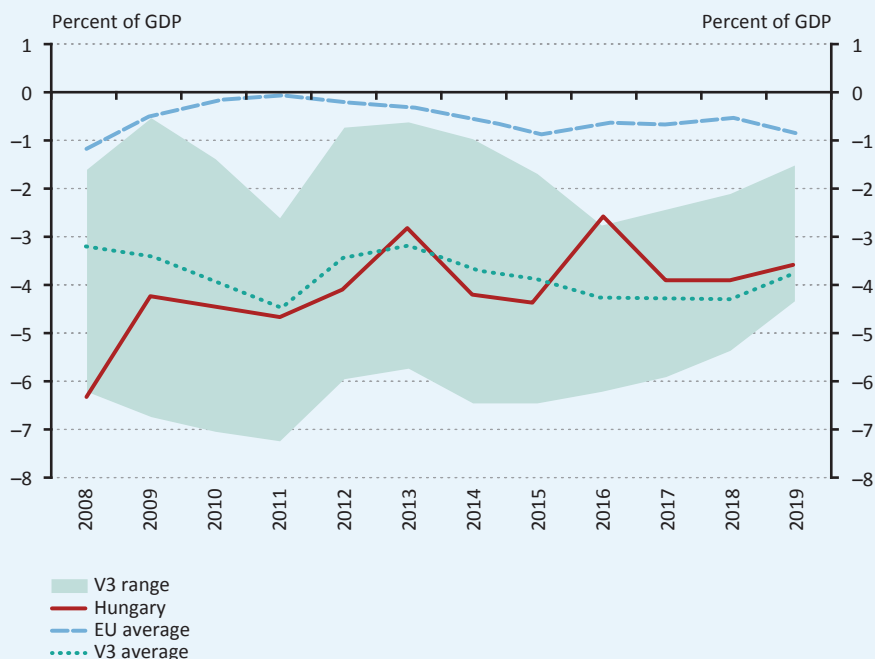
Chart 3.4
Net external debt in percent of GDP



Source: Eurostat, MNB.

Foreign capital inflows characterise the economic convergence of a country, and due to the profit and interest paid in connection with those, gross national income (GNI) falls short of GDP. In the pre-crisis period, this difference was exceptionally high in a regional comparison, which was attributable to the high FDI stock and substantial external indebtedness. After the crisis, the decline in the profit of foreign companies, the rise in the income of Hungarian employees working abroad and the reduction of external debt resulted in the narrowing of the GNI-GDP gap. The fall in external debt, registered in recent years, reduced the gap between GDP and GNI through the lower interest expenditure paid abroad, which by 2019 fell to almost half of the value registered a decade ago. The ratio gradually comes closer to the EU average, but it still exceeds it, partly due to the differences in the level of development.

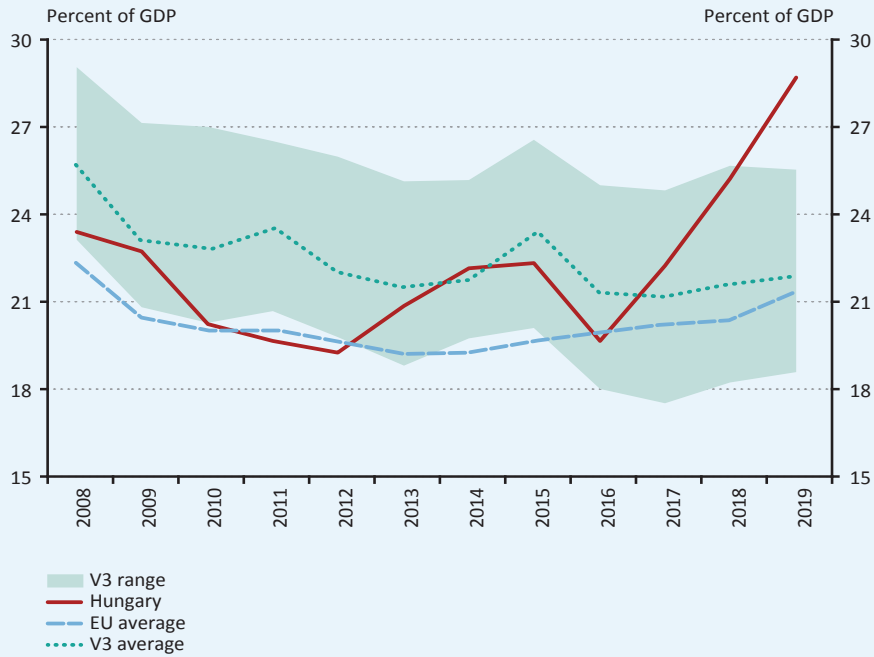
Chart 3.5
Difference between GNI and GDP as a percentage of GDP



Source: Eurostat, MNB estimate.

Hungary's investment ratio in 2018-2019 was the second highest among the European Union's Member States. High investment ratio is one of the fundamental pillars of sustainable growth, since it is necessary for the transition to the capital-intensive and then to the technology-intensive growth phase. The successfully converging countries were characterised by high investment rates of 25 percent or more in the period of catching up. The Hungarian investment rate already departed from the regional average prior to the crisis, following the adjustments in 2006 and then dropped considerably after the crisis (Chart 3.6). All three sectors (corporations, government, households) made positive contributions to the rise in the investment rate. In the past period, the increase in corporate investment was supported by the favourable interest rate environment, high capacity utilisation, the tight labour market, buoyant lending, the Funding for Growth Scheme as well as the decline in the relative price of capital (as compared to labour). Construction, as well as the building type investment of other sectors, were important sources of growth in the past period. At the same time, as a result of large investment projects and capacity expansions in manufacturing, investment in machinery also expanded considerably. In the past period, the rise in household investment was supported by favourable underlying income and lending trends as well as government measures (Family Housing Allowance, preferential VAT on new homes). The public investment rate shows high volatility, which may partly be explained by the changes in EU funds. In 2016, the Hungarian investment rate fell below the EU level due to the sharp decline in investments financed from EU funds, which is attributable to the change of the EU budget cycle; however, after 2017 it significantly increased and in 2019 reached 6 percent.

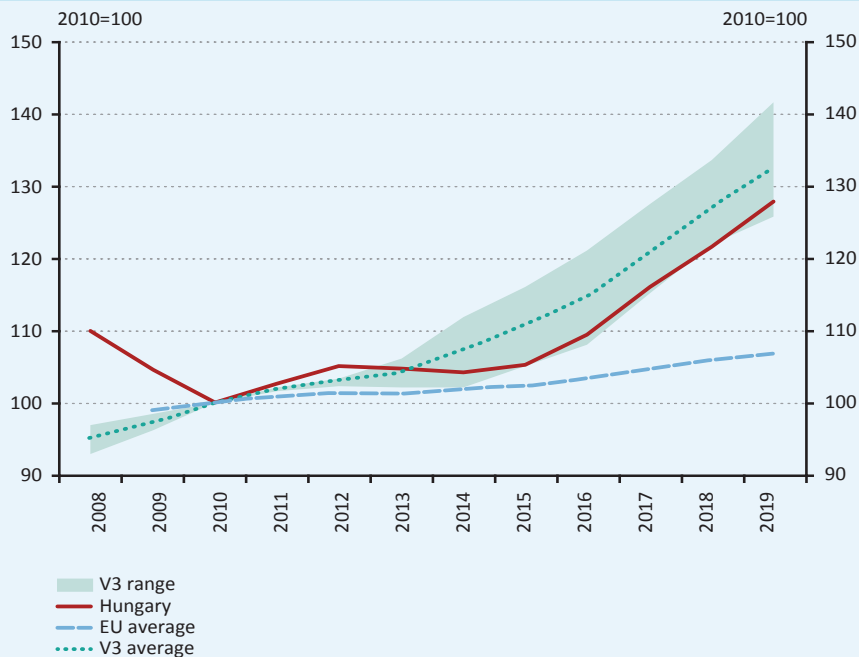
Chart 3.6
Development of investment rate as a proportion of GDP



Source: Eurostat.

In recent years major wage convergence was realised. Labour costs per hour – in real terms – declined to the largest degree in Hungary during the 2008 crisis (Chart 3.7). In the post-crisis years, wage costs, on the whole, rose faster than the EU average, but somewhat more moderately compared to the region. From 2013, in parallel with the restart of economic growth, corporations’ labour force demand also started to rise; however, initially, the growth in demand did not result in rising wages and costs for years due to the loose labour market conditions. From 2016, in the tight labour market environment, wage convergence recommenced both in Hungary and in the regional average, i.e. the growth rates considerably exceeded the EU average. The reduction of the social contribution tax in the labour cost index offset the double-digit increases in the minimum wage and guaranteed wage minimum.

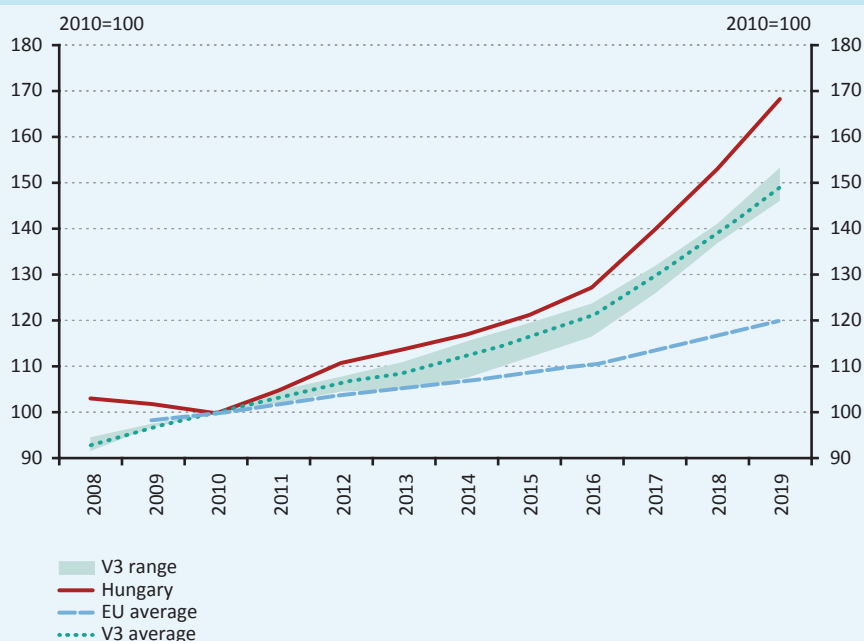
Chart 3.7
Labour cost index per hour (real)



Source: Eurostat, AMECO.

The rise in nominal labour costs per hour – compared to both the EU and the regional average – was more dynamic in Hungary; the value of the ratio rose by more than one and a half times between 2010 and 2019 (Chart 3.8). Within the European Union, the average increase in the labour cost index was considerably smaller; less than one third of the Hungarian rise was registered during this period. In the nominal index, the gap widening from 2016 was caused by the faster increase in producer prices, i.e. the Hungarian GDP deflator exceeded the average price increase observed in the region by almost 7 percentage points in 3 years.

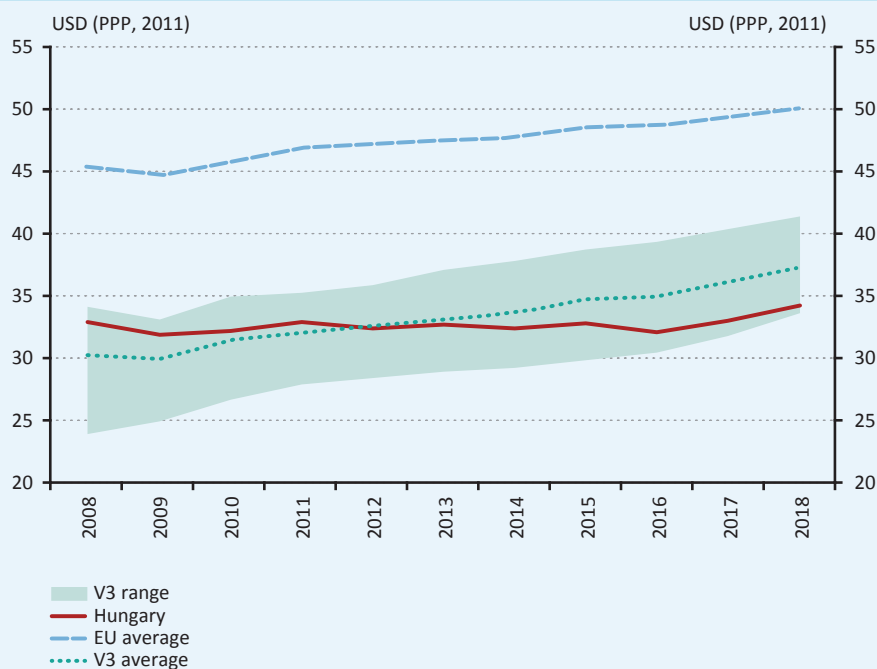
Chart 3.8
Labour cost index per hour (nominal)



Source: Eurostat.

Since 2016 the increase in employment took place in parallel with the improvement in labour productivity. In addition to the growth in labour costs, we also examine labour productivity trends when assessing cost-based competitiveness. Before the crisis, the level of Hungarian productivity was above the regional average; however, the crisis caused productivity to stagnate persistently in Hungary (Chart 3.9). By contrast, following a moderate decline, productivity continued to rise both in the countries of the region and on the average of the European Union. In 2012, the regional average already exceeded the Hungarian value, and the difference rose until 2016; nevertheless, the level of domestic productivity remained within the regional range. In relation to the change in domestic productivity, it should be noted that from 2010, as a result of the labour market reforms aimed at the simultaneous stimulation of supply and demand, the number of the economically active and the number of people in employment substantially grew. Since the productivity of new entrants fell short of the average, in the short run it decelerated the improvement in productivity through the negative composition effect. As the combined result of this, until 2016, economic growth was characterised by a labour-intensive phase, where dynamic expansion in employment was accompanied by stagnating productivity. As a result of the tightening labour market, from 2017, economic growth has become increasingly capital-intensive, and thus labour productivity also started to rise.

Chart 3.9
Labour productivity (GDP per working hour)



Source: Eurostat, WDI.

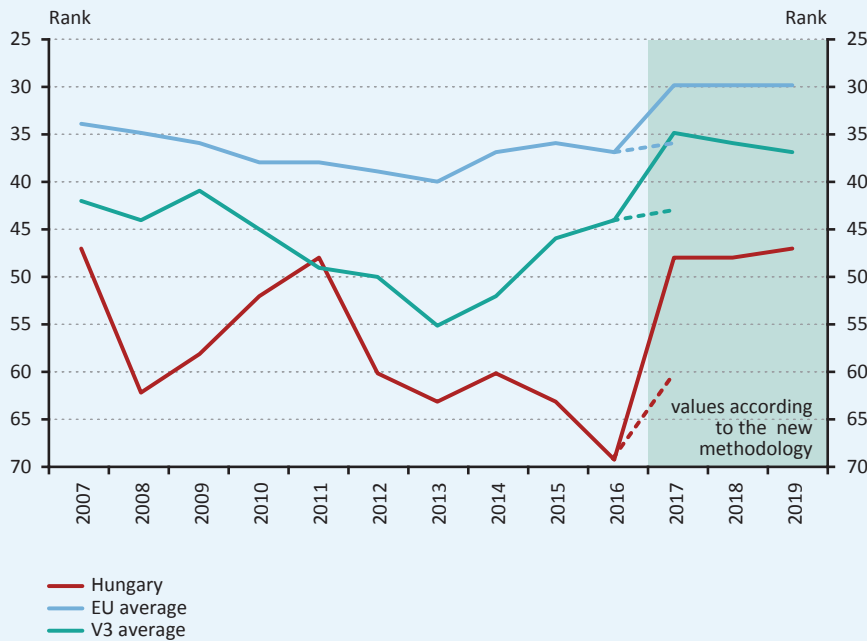
3.2 RESULTS OF INTERNATIONAL COMPETITIVENESS RANKINGS

Results of the 2019 global ranking prepared by the World Economic Forum

The Global Competitiveness Index (GCI), prepared by the World Economic Forum, assesses the competitiveness of the individual countries based on a wide range of economic and social indicators; however, its methodology limits international comparability. The survey applies subjective indicators to a great degree, which thus are unable to reflect the differences between the levels of the individual countries accurately. It is a positive development that after 2017 the ratio of the objective indicators in the WEF survey rose from 26 to 43 percent, and the number of interviewed experts also rose. The significance of the methodology and the bias of the subjective assessment is evidenced by the fact that this change alone improved Hungary's position in the ranking by 12 places.

In 2019, Hungary moving up by 1 place in the ranking was ranked 47th in the analysis surveying 141 countries. Of the Visegrád Four, only Hungary was able to improve its position. Poland kept its 37th place from 2018, Slovakia slipped back by one place to the 42nd place, while Czechia moved back in the ranking by 3 places and took the 32nd place. Of the 28 countries of the European Union, Hungary is ranked 24th.

Chart 3.10
Time series-based changes in Hungary's competitiveness ranking in an international comparison according to WEF GCI

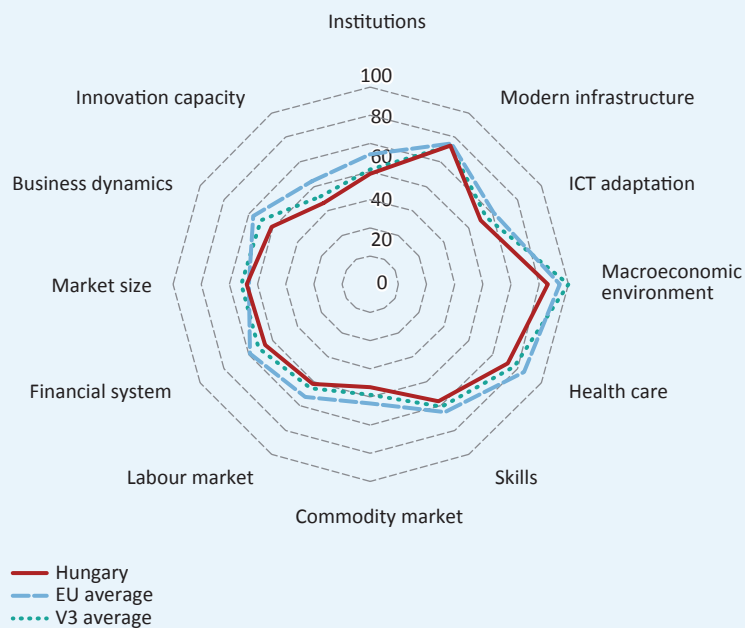


Note: The new methodology was applied retrospectively from 2017 in order to ensure the comparability of the results. The rankings based on the old methodology of 2017 are indicated by dotted line in the chart.

Source: WEF GCI.

As regards the individual sub-areas of WEF, Hungary has a competitiveness position close to the Visegrád region.

Chart 3.11
Absolute performance of Hungary, the V3 countries and the European Union in respect of the 12 pillars (on a scale of 0 to 100)



Source: WEF GCI.

Results of the World Bank Doing Business 2020 ranking

According to the World Bank's – Doing Business report, which focuses on the foundation and operation of businesses, Hungary was ranked 52nd, after improving its position by one place, in the competitiveness ranking covering 190 countries. Instead of macroeconomic parameters, a regulatory environment for a modelled medium-sized company as well as the efficiency of starting and maintaining a business and of bureaucracy were taken into account in preparing the ranking. All these indicators are objective.

Hungary's competitiveness score rose from 72.3 points received in the 2019 ranking to 73.4 points last year, while its relative ranking has hardly changed. The Visegrád countries were down by five positions on average, and thus Hungary came closer to its regional competitors. Poland (40th), Czechia (41st) and Slovakia (45th) were down by 7, 6 and 3 places, respectively, compared to previous year's results, but all of them were still ranked higher than Hungary.

	Hungary	Czechia	Slovakia	Poland
2020	52.	41.	45.	40.
2019	53.	35.	42.	33.
2018	48.	30.	39.	27.
2017	41.	27.	33.	24.
2016	42.	26.	30.	25.

Source: World Bank Doing Business.

Hungary achieved the highest rankings in trading across borders (1st), enforcing contracts (25th), registering property (29th) and getting credit (37th). At the same time, foreign trade openness is exceptionally high in all Visegrád countries. In the enforceability of contracts, Hungary obtained a good position primarily due to the relatively low cost of the proceeding; the time required and the number of procedures are roughly at the same level as the average of the OECD's high income countries, the group where Hungary is also allocated to by the report. In this pillar, Hungary performs extremely well even compared to the countries of the region, as of Visegrád Four it was Slovakia that came closest to Hungary with its 46th place. The number of procedures necessary for property registration and the duration of those is lower than the average of the countries with the same income level, which reduces the administrative burden, while the costs of these procedures are higher than the average. As regards the access to credit, Hungary performs well both in its income group and at the regional level in terms of the legal background of lending; however, it slightly falls short of the average in both groups in the availability and accessibility of credit information. On the whole, it is still the best performing country, together with Poland, in the Visegrád region.

At the same time, according to the Doing Business report, the operation of companies is excessively hindered by several regulations. Hungary was ranked the lowest in the areas of getting electricity (125th), dealing with construction permits (108th), protecting minority investors (97th) and starting a business (87th). Connecting electricity for businesses, in addition to being an extremely time-consuming process (it may take 257 days, while in some countries it takes merely 18 days), is also rather expensive. The issuance of construction permits for greenfield investments takes place in twice as many proceedings as in the EU, but the total length of these exceeds the average only by 25 percent. The protection of minority investors is the weakest in Hungary among the Visegrád countries. This pillar measures the conflict management possibilities of minority investors and their ability to enforce their interests in company management. Starting a business in Hungary is more complicated than in the high-income countries primarily due to the number of required procedures and the amount of the prescribed minimum start-up capital. However, it is a plus that among the regional competitors, it is the easiest to start a business in Hungary.

Chart 3.12
Average rank of Hungary, the Visegrád countries and the EU Member States in the ten pillars



Source: World Bank Doing Business.

The efficiency of the bankruptcy proceedings is the weakest in Hungary in the Visegrád region. The ratio of the liabilities paid during the proceedings is low, while the conducting of the procedures is expensive compared to the high-income OECD countries. The main reason for lagging behind the regional competitors is also the low payment ratio as well as the low score in the insolvency framework index calculated by the World Bank.

Last year the most remarkable progress was achieved in taxation: Hungary improved 30 places, and it is ranked 56th. The total corporate tax rate (total tax on capital and labour paid by medium-sized enterprises as a percentage of pre-tax profit) substantially declined in Hungary in the past 10 years, the rate of which at 38 percent is already lower than the regional (45 percent) and the EU (39 percent) average. This was contributed to by the reduction of the rate of the corporate income tax and employers' social contribution tax as well as by the improvement of electronic tax administration. Despite the numerous government measures aimed at the easing of administrative burdens, the World Bank assesses, for almost ten years, the time spent by enterprises on tax administration at an annual level in 277 hours. This is extremely high compared to the average of the EU and the high-income OECD countries (172 and 159 hours, respectively), while the average of the Visegrád countries (252 hours) can be achieved more easily. The time spent on tax administration curbs the productivity of economic agents, which could be remedied by the issuance of the corporate tax returns by the tax authority, the automation of tax administration and the simplification of taxation procedures.

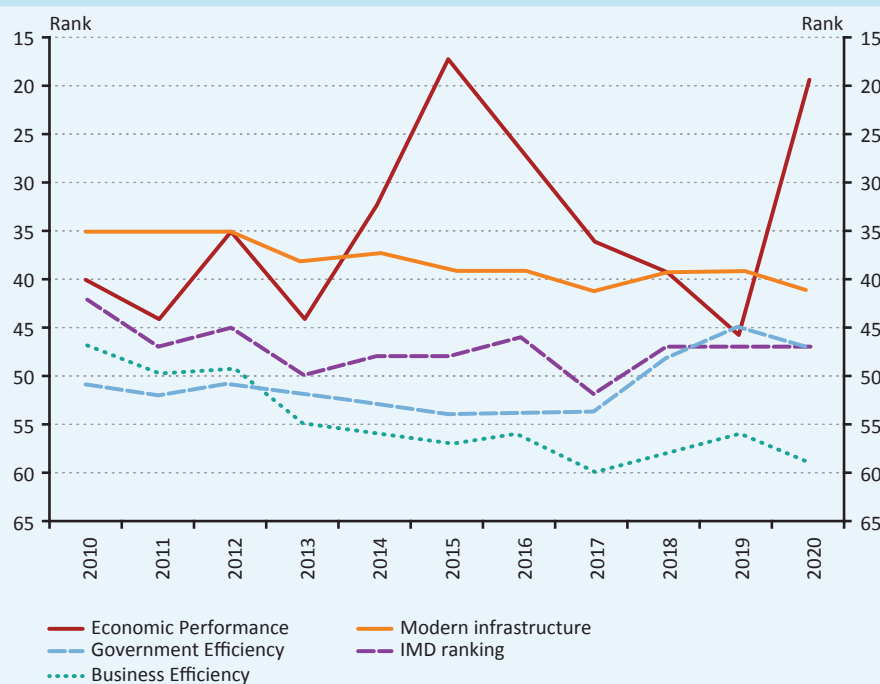
Results of the 2020 ranking prepared by the IMD

In the latest, 2020 IMD ranking, Hungary took the 47th place, which corresponds to its position one and two years ago. For the preparation of its competitiveness ranking, IMD uses 337 indicators grouped in four pillars, two-thirds of which are objective, and one third is based on a subjective, questionnaire-based survey. Of the key competitiveness rankings, IMD assesses the fewest countries (63), but mostly the developed economies, and it is mainly due to this fact that in this ranking Hungary is in the mid-range, but relatively towards the end of it.

According to IMD, Hungary in one of the four main pillars of the ranking – in economic performance – achieved major progress, while in the other three (government efficiency, business efficiency and infrastructure) performed slightly more weakly. Within the four main pillars, Hungary achieved the worst result in the efficiency of the private sector, which is also the weakest pillar in historic terms, where in 2015 and 2019 Hungary was ranked 56th, while in 2020 it was ranked

only 59th. Following the declining trend of economic performance in recent years, in 2020 the Hungarian performance improved 27 places and was ranked 19th in the international field, thereby coming close to its achievement in 2015, when it was ranked 17th in the pillar. This is due to Hungary's economic performance, which gradually improved in recent years and in many areas deemed outstanding even by EU standards (GDP growth of 4-5 percent, high savings and investment ratios, declining debt ratios, record low unemployment).

Chart 3.13
Hungary's ranking in the IMD's aggregate ranking and in the four main pillars



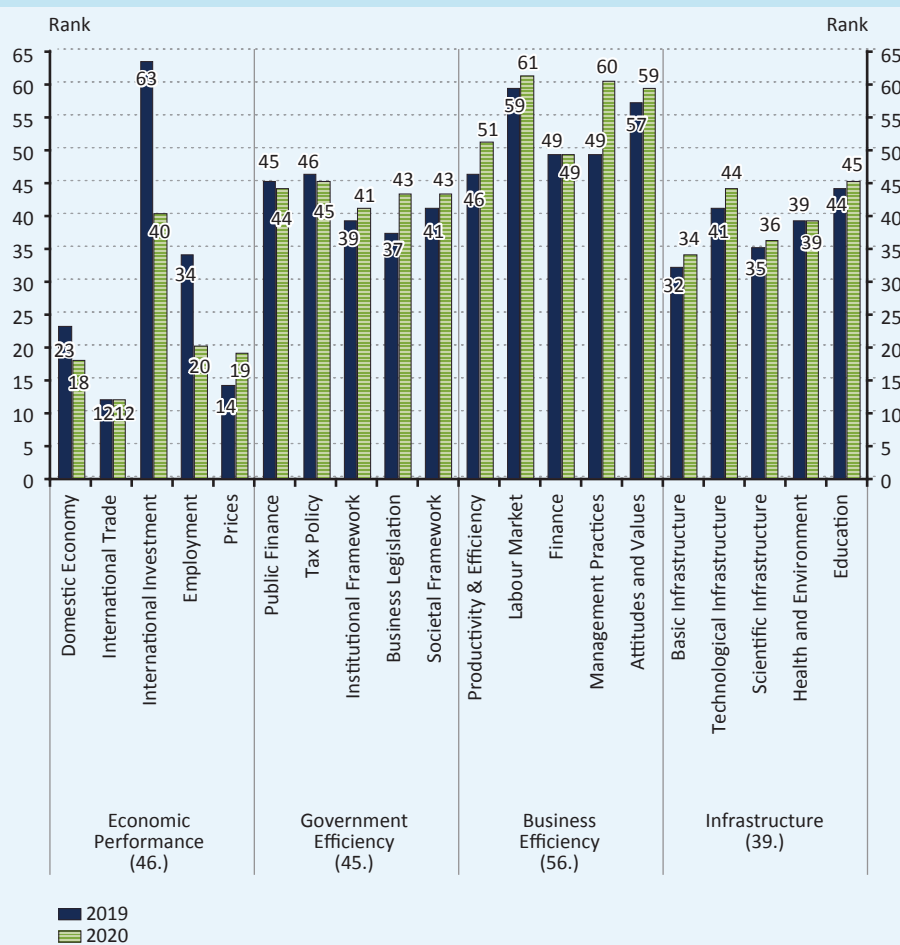
Source: IMD.

Within the economic performance (19th) in the domestic economy sub-pillar Hungary improved 5 places (moving from the 23rd to the 18th place), due to the favourable position achieved in the GDP growth (the largest growth among all countries) and the gross fixed capital formation (third highest ratio) indicators. Our position also substantially improved in the international investments sub-pillar, moving from the 63rd to the 40th place, mainly due to the increase in the inflow of foreign direct investments. Hungary also achieved major progress in the area of employment (from 34th to 20th), contributed to by the favourable employment prospects and the low unemployment rate.

Hungary slipped back two places in the government efficiency (47th) pillar due to deterioration in the business legislation (43rd), societal framework (43rd) and institutional framework (41st) areas. The blame for the worsening of Hungary's ranking is put on the shortcomings in competition law and the hidden economy, and there is also room for improving competitiveness in the tax system (primarily in the area of VAT and employees' contributions). On the other hand, the IMD regards the lowest corporate income tax (9 percent) in the ranking, the growth in the household disposable income (8th), moderate customs restrictions (12th) and the stimulation of investments (14th) as the strengths of Hungary.

In the efficiency of the private sector (59th) pillar, Hungary slipped back three places, mostly due to the slip-back by 11 places in the governance practice (60th) sub-pillar. The slip-back in the area of governance practice is mostly attributed to the inflexibility of companies and the inadequate social responsibility of corporate managers. Within the five sub-pillars, Hungary's performance stagnated only in the financial market area, while the greatest challenge is posed by globalisation and availability of skilled labour force. On the other hand, the ranking emphasises the fair remuneration of senior executives and the anticipated growth in the labour force as positive factors.

Chart 3.14
Hungary's rankings in the IMD sub-pillars in 2019 and 2020



Source: IMD.

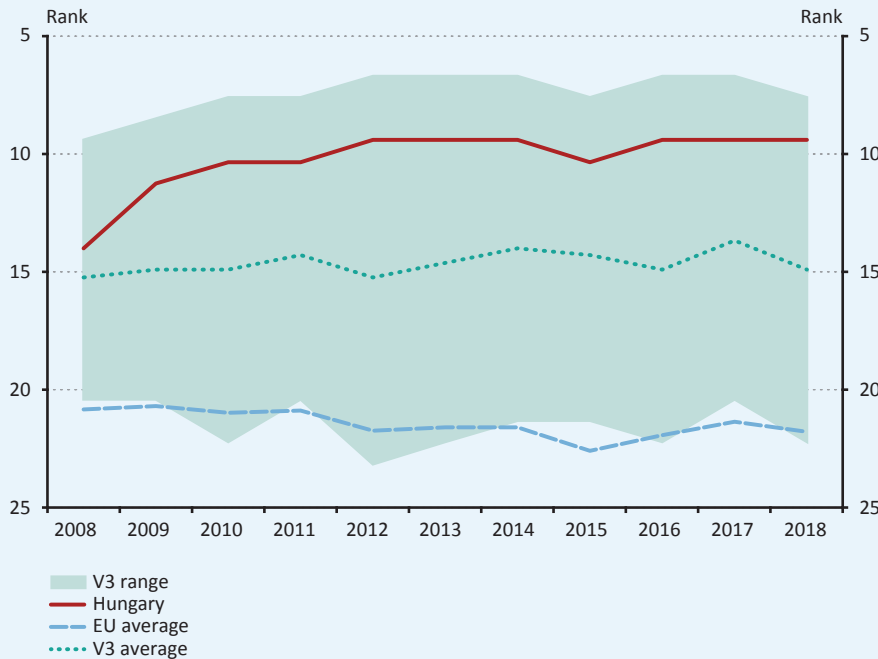
In the area of infrastructure (41st), Hungary slipped back two places compared to 2019. Of the five sub-pillars that constitute the pillar, Hungary's ranking did not change in the area of environment and health care, while it worsened by one place in the areas of scientific infrastructure and education. In addition, Hungary slipped back two places in basic infrastructure and three places in technological infrastructure. Based on the indicators, the greatest challenges for Hungary include the absence of language skills, the availability of qualified engineers and digital/technological skills. By contrast, the performance of Hungary is outstanding in the number of mobile broadband subscribers, the pupil-teacher ratio in primary schools and the medium and high value added produced within manufacturing.

The Economic Complexity Index

The Economic Complexity Index intends to capture the knowledge capital present in the countries, for which the trade structure and characteristics serve as tools. Economic complexity is calculated based on the total number of products and product groups exported by the countries under review and the number of countries that are able to produce these product groups. Accordingly, the index reflects the economic strength of a country stemming from its export diversity and product quality (hard-to-substitute, complex products). According to the producers of the index, countries of high economic complexity and presently low income may have the opportunity to break free from the middle-income trap. On the other hand, the high degree of economic development of countries with highly complex economies and high income can be maintained as a result of their complex knowledge base.

In 2018, out of 133 countries Hungary placed 9th in the ranking, surpassing the Visegrád and EU averages. Hungary's ranking was in the top 10 since 2010. The ranking of the V3 countries and the average ranking of the European Union falls behind Hungary by 6 and 14 places, respectively. In the ranking, Hungary is above, among other things, the United States of America, the United Kingdom, France, Belgium as well as the Netherlands. Japan has been in the lead in the indicator for many years, followed by Switzerland and South Korea.

Chart 3.15
Ranking of the Economic Complexity Index among 133 countries



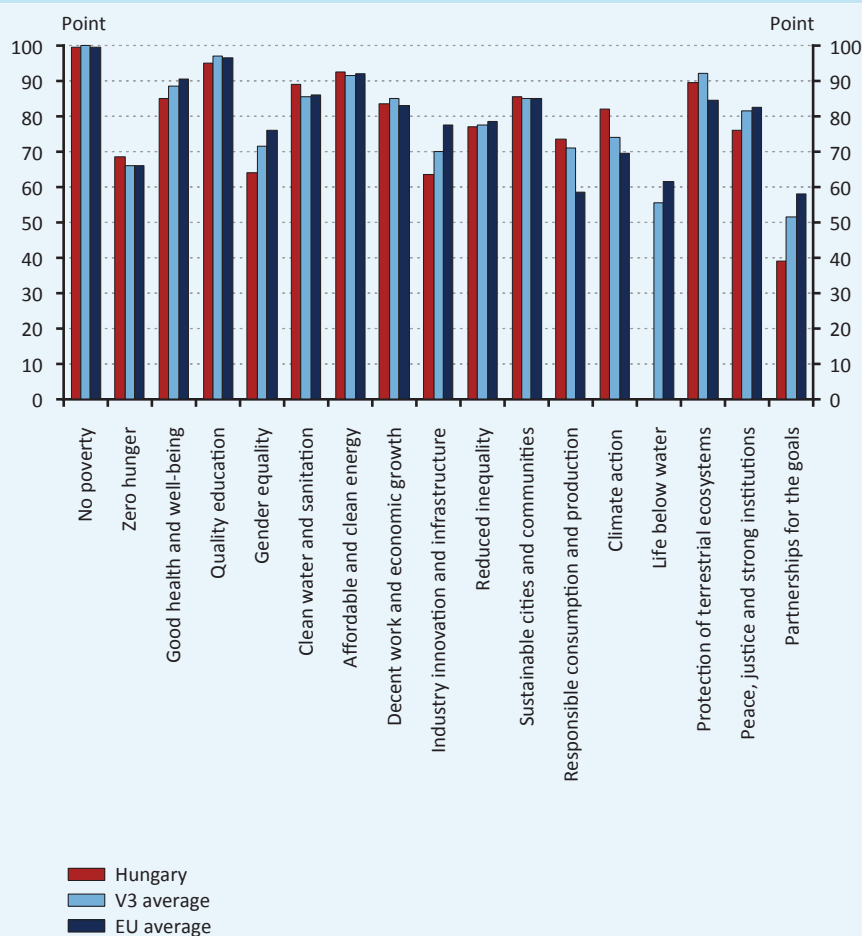
Source: Atlas of Economic Complexity Dataverse (Harvard University).

Results of the Sustainable Development Report in 2020

The purpose of the *Sustainable Development Report* is to measure primarily the social and environmental – and to a lesser degree the economic – sustainability alongside the UN's sustainable development goals in cooperation with the UN's *Sustainable Solutions Network* initiative. The ranking is prepared annually based on the degree of the realisation of 17 sustainable development goals (SDGs).

Among the 166 countries included in the report, Hungary was ranked 29th in 2020, slipping back four places compared to 2019. Of the Visegrád countries Czechia worsened by one place, but still achieved the best result (8th), Poland improved six places (23rd), while Slovakia retained its ranking (27th). The ranking is led by the Northern European countries, with Sweden, Denmark and Finland taking the first three places.

Chart 3.16
Hungary's score in the realisation of the UN's sustainable development goals (2020)



Note: The ratings may take a value between 0 and 100, where the higher value represents better performance.

Source: UN (2020): Sustainable Development Report 2020.

Hungary made the greatest progress in the realisation of the sustainable development goals such as the elimination of poverty, high-quality education, affordable and clean energy and the protection of terrestrial ecosystems. The report reckons that the two areas where Hungary has attained the set goal are the elimination of poverty and the protection of terrestrial ecosystems. Hungary performs well in each of the indicators belonging to these two areas; for example in the ratio of inhabitants living below the poverty line of USD 1.9 or USD 3.2 per day (0.5 and 0.7 percent), in the protection of terrestrial (83 percent protected) and fresh-water (85 percent protected) areas, important in terms of biodiversity, or in the red list index (change in the extinction risk for species). Based on the 2020 report, Hungary makes good progress toward the realisation of the goals in the area of clean water and basic public hygiene. At 6 of the 7 indicators that constitute the area the set goal has already been realised; however, in the area of the population's access to safe water resources (90 percent) further improvement is necessary.

Hungary faces the greatest challenges in combating climate change, the elimination of famine and in the area of industry, innovation and infrastructure. In Hungary, the ratio of workers employed in R&D and the number of patents lag behind the competitors, and the Hungarian population's body mass index is also relatively high. In the area of combating climate change, only Romania precedes Hungary in the EU; nevertheless, further efforts are necessary to attain the sustainable development goal.

Box 1**Methodological differences between the global competitiveness rankings and the MNB's national competitiveness index**

The purpose of the competitiveness rankings is to provide a real and comparable picture of the countries' competitiveness relative to each other based on economic and social indices. For this reason, the competitiveness rankings typically use composite indices compiled from several indicators, which boil down the countries' results achieved in several indicators to a single index. The range of indicators used for the compilation of the international rankings vary between broad bounds; while IMD compiles its ranking based on 255 indicators, Doing Business assesses 41 indicators. The MNB's competitiveness index for 2020 was compiled by aggregating 154 indicators, as a result of which among the international rankings cited in the *Competitiveness Report* it is one the most comprehensive and objective indices. Its special feature is that while the rankings use the distance to frontier (DTF) method for the standardisation and aggregation of their indices for the final ranking, the MNB calculated its index in accordance with its self-developed methodology. Although the latter is also based on the DTF method, it also takes into consideration the standard deviation of the data.

Based on the MNB's approach, the international competitiveness rankings should comply with 3 main criteria (comprehensive, global, objective) simultaneously, of which they satisfy only two. The MNB believes that for the reasonable and comparable assessment of a country's global competitive position, three main conditions should be met: it should be comprehensive, global, and objective. In the course of a competitiveness assessment, an analysis may be deemed comprehensive if it uses a wide range of indicators in the most essential areas of competitiveness. It may be deemed global if the majority of the world's countries are involved in the assessment. The criterion of objectivity is met when the vast majority of the used data originate from factual and objective sources. The International competitiveness rankings are able to satisfy only two of the three conditions simultaneously; for example, of the three most often cited international rankings, the WEF ranking is comprehensive and global, but not objective, the World Bank's Doing Business ranking is global and objective, but not comprehensive, while the IMD ranking is sufficiently comprehensive in terms of content and tends to be objective, but due to its relatively low coverage of countries, it can be regarded as global to a lesser degree.

Table 3**Key structural features of the most common competitiveness rankings and of the new MNB Competitiveness Index**

	World Economic Forum – GCI	World Bank Doing Business	IMD - WCR	Economic Complexity Index	Sustainable Development Goal Index	MNB Competitiveness index
Ranking of Hungary	47.	52.	47.	9.	29.	19.
Number of countries assessed	141	190	63	133	166	28
Ratio of objective indicators	43%	100%	64%	100%	92%	95%
Number of indicators	103	41	255	2	116	154
Comprehensive	✓	✗	✓	✗	✓	✓
Global	✓	✓	✗	✓	✗	✗
Objective	✗	✓	✓	✓	✓	✓

Source: MNB

As regards the focus of the countries under review, there are national and international competitiveness rankings. It is usually typical of the known international competitiveness rankings (e.g. WEF, Doing Business) that they aim at more comprehensive geographic coverage. However, therefore they often need to make a compromise, as the

quality, objectivity and comparability of the data are prejudiced. By contrast, the national competitiveness analyses primarily focus on the more in-depth assessment of the respective country. The MNB's *Competitiveness Report* also belongs to this latter group, with the difference that upon creating the publication the central bank consciously selected the European Union as a benchmark, thereby simultaneously ensuring adequate and factual data quality and comparability with the direct competitors.

There is a major difference between the competitiveness rankings based on whether the used indicators are objective or subjective. Precise and credible assessment of the situation is an essential precondition for competitiveness reforms; accordingly, in its competitiveness analyses, the MNB relies on objective indicators in the vast majority of the cases (in 95 percent). While the *Competitiveness Report* performs in-depth analysis and assessment of Hungary's competitiveness in the relevant regional context, the global competitiveness rankings usually prepare no analysis and assessment and apply a large number of subjective indicators reflecting value judgement, which distort the real state of affairs. This is particularly true of the *WEF-GCI* ranking, which assesses 141 countries based on 103 indicators, but 57 percent of the indicators are subjective. WEF often uses subjective surveys even when factual, objective indicators would also be available. However, the results of the questionnaires measuring subjective sentiment substantially complicate and question the comparability of countries and periods. This is due to the fact that the questionnaires do not provide uniform reporting content, and the sample size of the respondents is usually small and not representative. As a result of the subjective survey, the competitiveness rankings reflect ranks and changes that contradict to the real trends.

4 Competitiveness indicators

4.1 NEW FINANCIAL MODEL

Provision of access to efficient and stable bank financing is essential for the maintenance of Hungary's economic convergence. Although the private sectors' financial deepening still falls short of the regional and EU average, from 2017 the outstanding – even in an international comparison – growth in lending took place in a sound structure, strengthening the economy.

As regards the ratio of small and medium-sized enterprises facing financing constraints, Hungary reached the average of the V3 countries; however, the productive corporate allocation of capital can be improved further by the diversification of financial channels, strengthening of digitalisation and the increasing of the efficiency of the institutional guarantee scheme. While in the corporate segment the Hungarian banking system is in the mid-range of the EU in terms of pricing, in the household segment the APR-based spread of housing loans reflects moderate competition. Although the introduction of the Certified Consumer-friendly Housing Loans somewhat helped approximate from above the loan pricing of the countries of the region, Hungarian spreads may still be considered high. Since the costs of risk do not justify the significant spreads in an international comparison, the price competition presumably could be fostered by the reduction of operating expenses and the extending of the digital infrastructure, while the easing of the comparability and substitution of products could strengthen it further thereafter.

Efforts should be made to ensure the predictability of the instalments in all segments and credit products. Following the phase-out of the Funding for Growth Schemes, the ratio of variable rate loans once again increased in new lending, which was remedied by the FGS Fix, launched in 2019, to a large degree, and thus forint-denominated SME loans with interest rate fixed for more than 3 years once again exceeds 50 percent. In the household segment, the variable rate loans – the ratio of which was more than 40 percent at the beginning of 2016 – have practically disappeared from the market by now, which was also attributable to the acceleration of the Certified Consumer-friendly Housing Loan products. This may have an effect on the interest rate risk included in the formerly built portfolio only through loan refinancing; however, in this part of the portfolios the MNB's recommendation issued in April 2019 and the reduction of the fees may mitigate risks in the long run.

In addition to the interest rate risks, the level and concentration of the indebtedness are also important considerations. As regards the debt-to-income ratio, there are no signs that imply stability risk in a regional comparison, while the debt cap rules prevent the build-up of excessive concentration. On the other hand, the financing constraints that result in the exclusion of certain social groups from the financial system may give rise to problems. Based on the international data, as regards the total population there is a perceivable lag in the ratio of bank account holders, and in certain, more vulnerable groups the drawback is even greater. The prioritisation of electronic channels and the reduction of cash usage may facilitate financial inclusion on the one hand, but they may also increase the isolation of vulnerable persons preferring traditional banking. Among those without a bank account, the recurring reasons for avoidness from financial institutions include the high pricing of services as well as the absence of savings and trust; accordingly, the key to achieving wider access should be primarily looked for in the latter areas.

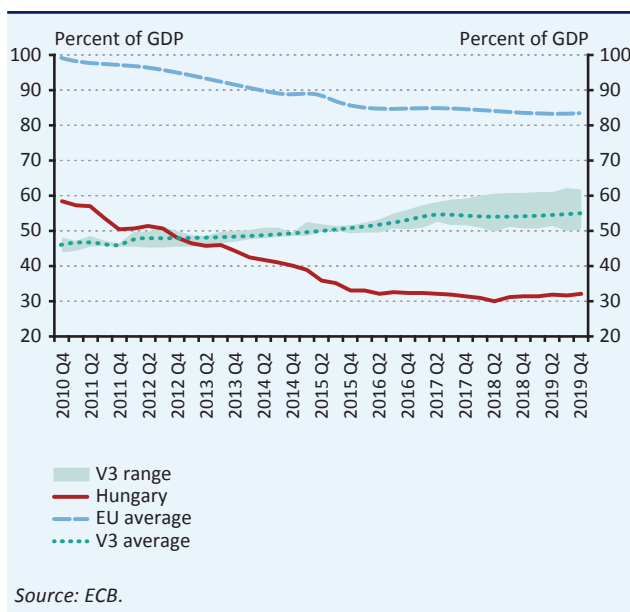
With a view to maintaining the banking sector's role supporting the economy in the long run, strong capital formation and attraction capacity as well as the prevention of systemic stability risks are indispensable. As regards the profitability of the sector, the post-crisis loss-making period ceased in 2016, and since then the Hungarian banking sector is usually in the vanguard of the EU in the return on equity (RoE) ranking. In the period mentioned above, major portfolio cleansing was also implemented, which – in the mirror of high impairment coverage and capital adequacy, and the debt cap rules mentioned before – shows a positive financial stability picture. Although banks' profitability under the favourable Hungarian economic activity is outstanding, it conceals certain structural problems of the sector. Part of the domestic banks need to take further efficiency improving measures in order to ensure sustainable profitability. Operating expenses

should be preferably reduced through digitalisation, greater financial penetration and consolidation, being measures that do not preclude each other.

In the past decade, keeping abreast of consumer needs, the utilisation of the innovative technological solutions and of the digital space and channels, gained increasing importance in the functioning of the financial system. Online interfaces are widely used in the world, and thus the emergence and strengthening of the requirement that consumers should be able to manage their financial affairs, similarly to other services – such as shopping and communication – through digital platforms, without visiting the branch and personal presence, was a natural phenomenon. Against this backdrop it is of key importance to develop a domestic financial system that is able to adjust to the changing consumer needs flexibly and rapidly. Important elements of the digital transformation process include the financial institutions' capability of making developments through which they can provide their customers with continuous access to their services or minimise the need of personal presence to use their products.

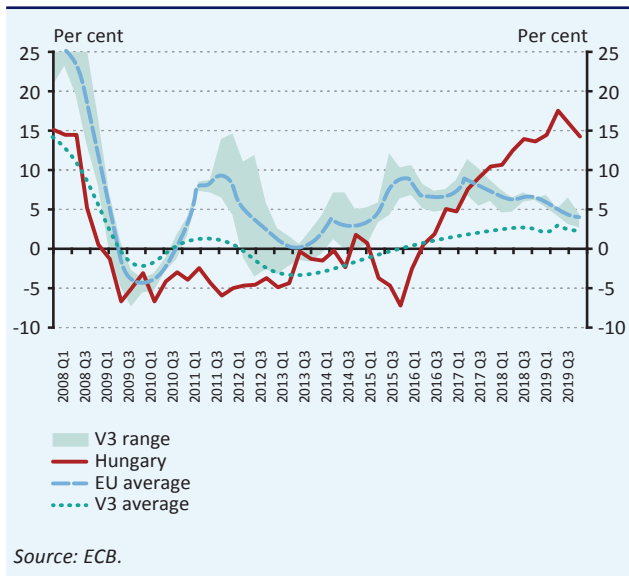
In addition to the digital transformation of existing financial institutions, the existence and development of an advanced FinTech ecosystem and the institutional and legislative background supporting this are also of key importance. For example, the development of a regional centre could substantially support the competitiveness of a country or region. FinTech solutions typically include developments that not only provide both the traditional and the newly established institutions with cost-efficient operation, but may also contribute to the better, faster and more customised satisfaction of customer requirements at a favourable price. Considering the international trends, it is important that the Hungarian regulation should actively support the use of FinTech-based solutions on a wider scale, at the same time creating or proposing changes in the legislative framework bearing in mind consumer protection, financial stability and competitive neutrality aspects.

4.1 Developments in the volume of lending to the private sector as a percentage of GDP



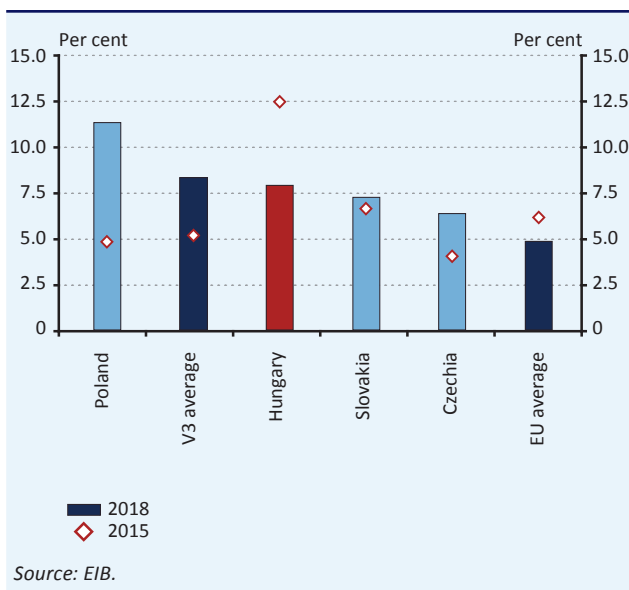
Efficient financing of the economic agents, spanning through cycles, is essential for ensuring sustainable convergence of the economy. As regards the historic data, after the crisis, until mid-2018 the outstanding debt of the private sector as a percentage of GDP followed a declining trend. Although the dynamic growth in lending, registered in recent years, reversed the negative trend, the economic growth realised in parallel with the new loans left credit penetration at almost the same low level as before, which thus continues to represent substantial reserve.

4.2 Development of corporate lending dynamics



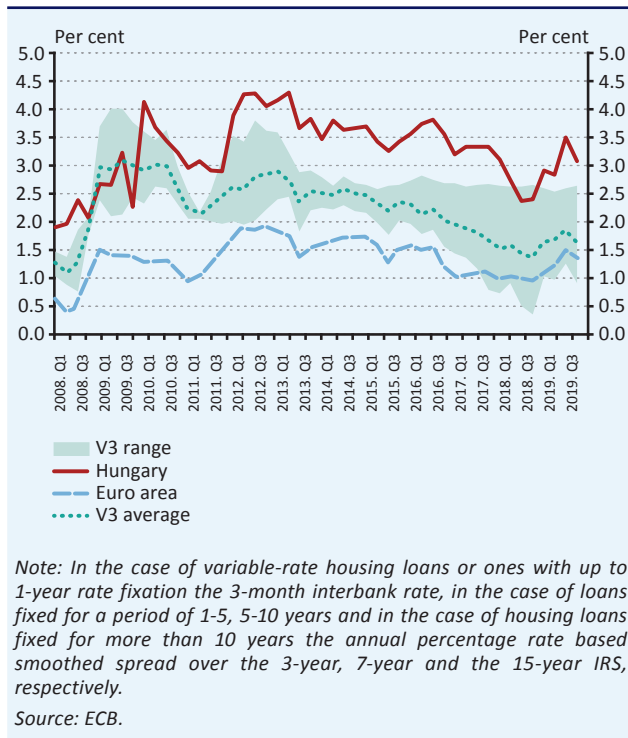
The credit dynamics of the corporate sector plays a particularly important role within the outstanding debt of the private sector, since lending by banks is key to the fund raising of corporations necessary for the high investment ratio. In the past years, Hungary was characterised by outstanding growth in lending, even by international standards; in 2019 the outstanding debt of corporations rose by almost 14 percent. However, the lending cannot be deemed overheated; as a result of the credit contraction in the post-crisis years, corporate indebtedness substantially decreased; the credit expansion supports financial deepening and convergence.

4.3 Ratio of enterprises facing financing constraints



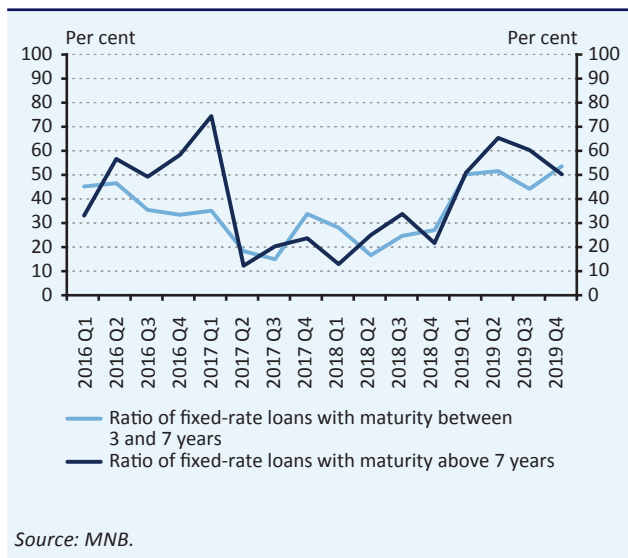
Based on the EIB’s investment survey, almost 5 percent of the enterprises operating in the European Union met external financing constraints in 2018. In the past years the access of Hungarian corporations to funding substantially improved, with material contribution by the MNB’s targeted programmes (FGS, MLS). However, the ratio of the Hungarian enterprises that face financing constraints still exceeds the EU average, while it corresponds to the average of the Visegrád countries. Accordingly, there is still room for improving this ratio, primarily through the diversification of financing channels and enhancing the efficiency of the institutional guarantee scheme.

4.4 Spread based on the APR on housing loans extended in domestic currency



The spread of the Hungarian housing loans exceeds both the average of the euro area and of the other Visegrád countries. This pricing disadvantage for the borrowers has been present continuously in the past decade. Although as a result of introducing the Certified Consumer-friendly Housing Loan, Hungary managed to reach temporarily the top of the band characterising the Visegrád countries, this trend turned in 2019, since the banks failed to enforce in the lending rates the fall in the benchmark rates. This may be also due to the fact that in the case of demand-driven expansion in lending to households – contrary to the corporate segment – competition among the banks is less intense. As a result of the foregoing, at the end of 2019, the average interest rate spread on the domestic housing loans amounted to 3.1 percentage points; the operating expenses, which are particularly high in an international comparison, presumably represent a constraint on this.

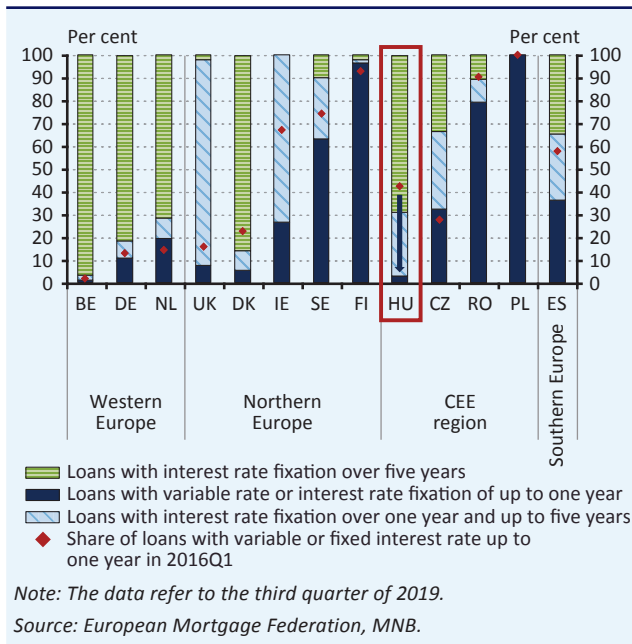
4.5 Ratio of fixed-rate SME loans within new loans



The reduction of interest rate risks and the increase in the ratio of fixed-rate loans – and thereby providing enterprises with stable, predictable financing, particularly in the SME segment – are important in terms of financial stability.

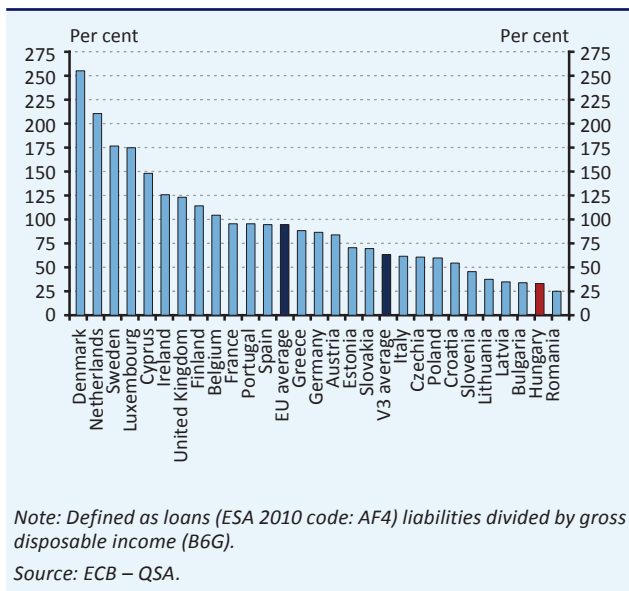
Following the phase-out of the previous Funding for Growth Schemes (FGS), the ratio of fixed-rate loans in new loans once again started to decline in the corporate segment. Since the launch of the FGS Fix scheme in 2019, among the forint loans with maturity over 3 years, also available under the programme, the ratio of fixed-rate loans once again returned to the desirable level of over 50 percent.

4.6 New housing loans by interest period



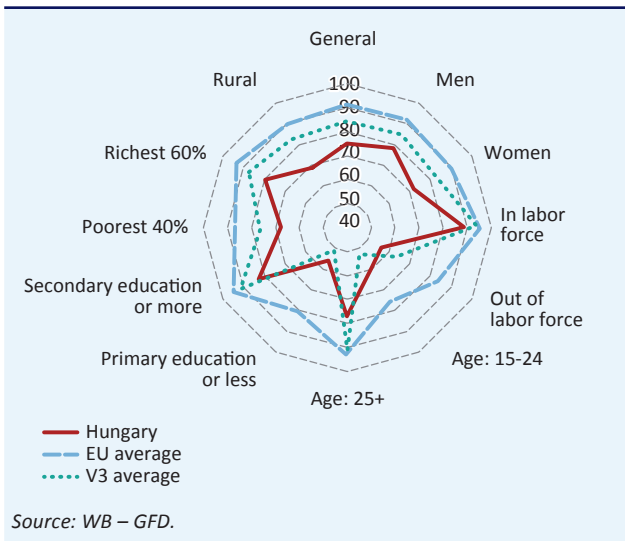
The predictability of instalments is of key importance in terms of the households’ indebtedness in a prudent and sound structure. In view of the fact that at the beginning of 2016 the ratio of variable-loans within new loans still accounted for 42 percent, in order to reduce the interest rate risk it was desirable to move toward longer interest periods. The introduction of the Certified Consumer-friendly Housing Loans together with the differentiation of the payment-to-income ratio based on the interest period practically ousted these risky loans from the market by the end of 2019; moreover, every fourth housing loan contract was concluded with interest fixed until maturity. In addition, the ratio of housing loans with interest periods of 5 and 10 years – following a continuous growth – is 28 and 45 percent, respectively, within the new loans. The results may be assessed positively also in a regional and EU comparison. However, it should be borne in mind that within the total outstanding debt the ratio of variable-rate loans disbursed earlier is still high. In the short run, the MNB’s recommendation issued in April 2019 is aimed at the fostering of interest rate fixation of borrowers with contracts carrying major interest rate risk. In the longer run, loan refinancing may be stimulated by making the related fees, particularly the early repayment and notarial fees, cheaper.

4.7 Households’ debt-to- income ratio (2019)



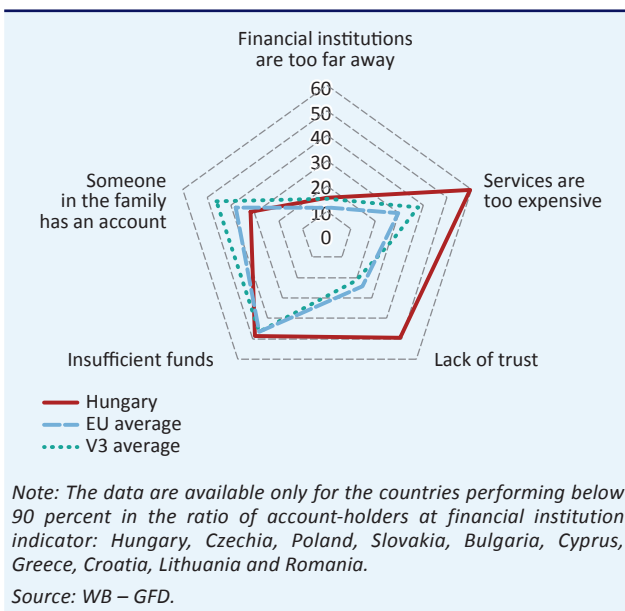
The Hungarian households’ debt-to-income ratio is one of the lowest in the European Union, and it also substantially falls behind the other Visegrád countries. This result, due to the low indebtedness, represents a growth potential in a sound structure, while the high levels resulting from the lending practices of certain countries (Denmark, the Netherlands, Sweden) forewarn of a potential debt overhang. The MNB, in its capacity as prudential authority, closely monitors the potential concentration of the credit portfolio and the distribution of the indicator related to the debt cap rules, particularly following the outflow of the Prenatal Baby Support Loans, available since July 2019, which may materially contribute to the growth in the ratio of households with loans.

4.8 Ratio of bank account holders at financial institutions (2017)



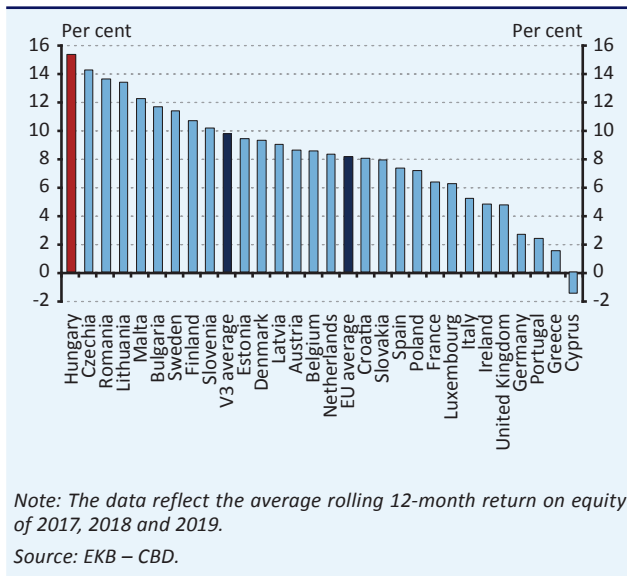
In order to improve financial deepening, it is necessary to ensure the general availability of banking services. Based on the international data, in Hungary the ratio of account-holders lags behind both the Visegrád and the EU average. In addition, we also found that in Hungary the more vulnerable groups (the inactive, those living in the countryside, the lower two-fifth in terms of income) are proportionally more disadvantaged in the area of financial inclusion. Although the digital channels may ease the inclusion of certain excluded customers, the rationalisation of the branch network, the reduction of the availability of cash, and giving preference to banking through digital solutions may be expedient only after giving due consideration to the banking and payment preferences and attitude of the individual regions and social groups. In the regions with no bank branches, the application of “mobile” bank branches and multifunctional ATMs to a larger degree may be justified. It may be also favourable to introduce free account packages for the socially disadvantaged persons. In addition, it is necessary to enhance the population’s financial awareness, which is responded to by numerous programmes – also promoted by the MNB – as well as by the National Core Curriculum.

4.9 Reasons for rejection specified by inhabitants with no bank account (2017)



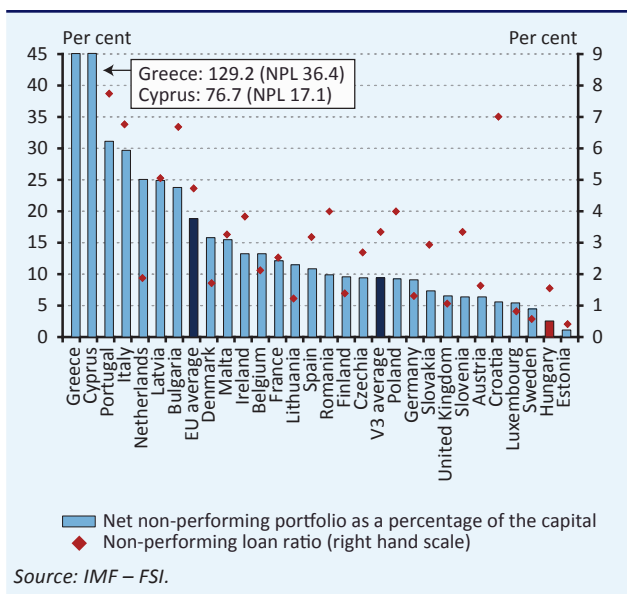
Information for the analysis of exclusion from the financial system is provided by the reasons specified in the surveys by persons with no bank account. Based on the World Bank’s survey, Hungary does not lag behind the average of the other Visegrád countries’ and EU member states’ average only in the “Someone in the family has an account” answer, while it is well above the average in the ‘High pricing of the services’ and ‘Lack of trust’. This confirms the MNB’s earlier finding about the high Hungarian banking fees, even in an international comparison. This could be substantially improved by the introduction of package pricing by the banks, which would strengthen market competition through the greater transparency of the banking fees. However, the ‘Absence of savings’, indicated by 49 percent of the respondents, highlights problems that go beyond the banking sector, which could be resolved by helping the excluded and vulnerable social groups catch up, and the programmes aimed at these groups, stimulating savings.

4.10 Return on equity



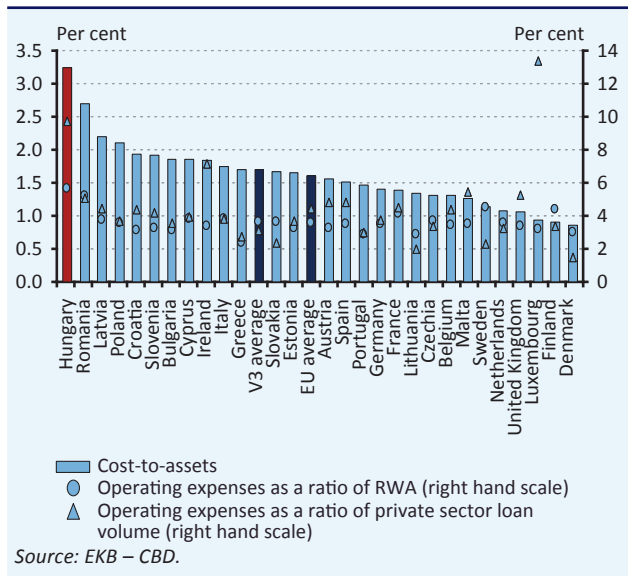
Following the pre-2016 loss-making period, the Hungarian banking sector came to the forefront of the EU in respect of the return on equity (RoE). One of the major sources of the outstanding result was the reversal of the formerly recognised impairments, which – although it is continuously declining since the end of 2017 – concealed the structural weaknesses of the sector. Although the cutting of the corporate tax rate and the strong credit dynamics point to a positive direction, banks need to reduce materially their operating costs-to-total assets ratio –which is also in the first three in the international ranking – in order to maintain the high profitability.

4.11 Net non-performing loan portfolio as a percentage of the capital (2019)



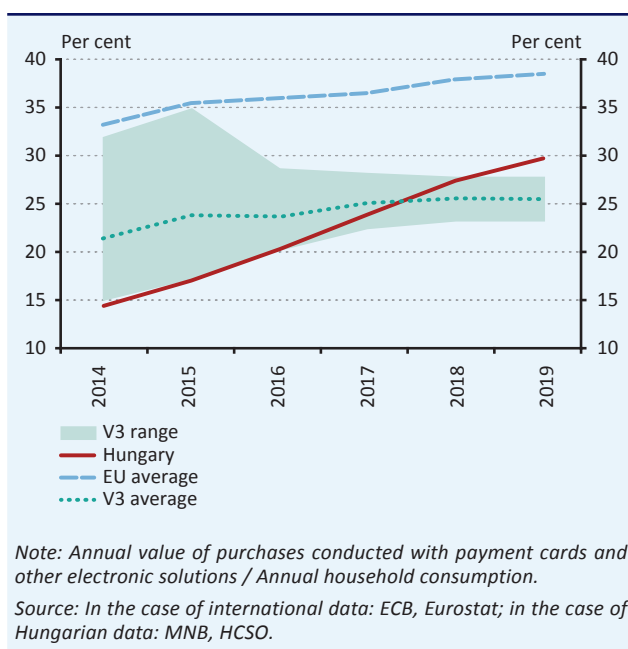
Owing to the large-scale portfolio cleansing performed in recent years, by September 2019 the credit institution sector’s household (4.7 percent) and corporate (4.4 percent) non-performing loan portfolio both fell below the level of 5 percent, deemed desirable by the MNB. At the same time, the project financing portfolio, susceptible to business cycles, still account for a large part of the non-performing corporate loan portfolio. The impairment coverage ratio for the outstanding non-performing loans was satisfactory – around 60 percent – in both segments, coupled with high, roughly 17.5 percent, capital adequacy. Accordingly, on the whole no stability risks jeopardising the operation of the sector can be identified.

4.12 Operating costs-to-total assets ratio (2019)



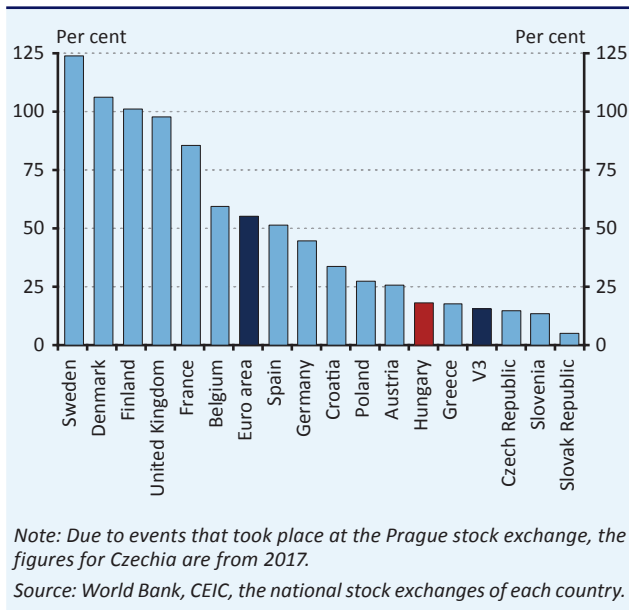
The Hungarian banking sector is one of the least cost-efficient in Europe, no matter whether the level of the operating costs is examined as a percentage of the balance sheet total or of the outstanding debt of the private sector. This is also the case at the domestic institutions when making adjustments for the bank tax, the financial transaction levy and the foreign subsidiaries. When breaking down the operating costs, the lag can be identified in the personnel costs to assets ratio and also in depreciation. In the medium run, the high cost level of the banking sector may also have negative impact on the sector’s sustainable operation and stability, in addition to the competitive disadvantage in pricing. In the medium and long run, the sector’s efficiency may be primarily improved by the comprehensive digitalisation of the operation, the deepening of financial penetration and by the consolidation of the presently fragmented market.

4.13 Ratio of electronic payments for purchases



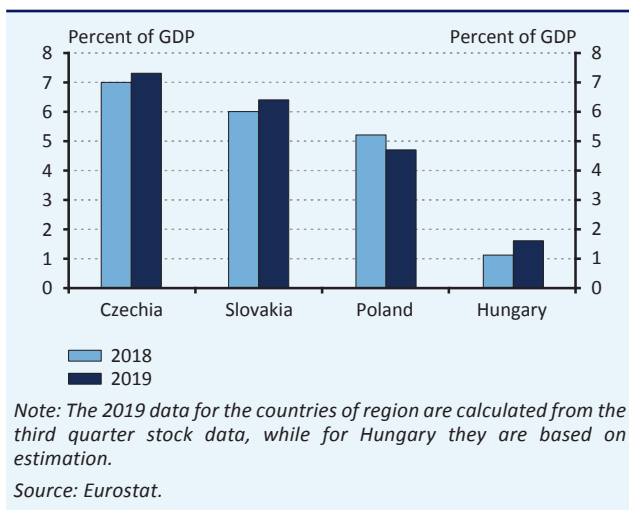
By increasing the ratio of electronic payments, both tax evasion and the social costs of certain payment methods can be reduced. In Hungary, in the past years the ratio of electronic payments has continuously increased, from 15 to 30 percent between 2014 and 2019, primarily due to the dynamic growth in the payment card turnover. With this performance Hungary already outpaces the V3 countries, but still lags behind the EU average of 38 percent. Between 2014 and 2019, Hungary managed to work off roughly half of the lag behind the EU member states, and if the trend persists, coming close to the EU average becomes achievable within a few years. The instant payment service, launched on 2 March 2020, may also greatly contribute to this.

4.14 Equity market capitalisation to GDP (2018)



In Hungary, market capitalisation as a percentage of GDP is low in an international comparison, standing at 18.3 percent. With this, Hungary follows Croatia and Poland in the regional field, although it precedes Czechia and Slovakia. In the Western European and Scandinavian countries, market capitalisation often exceeds even 100 percent. The diversified financial system serves as a basis for the competitive economy and sustainable growth. Whereas in Hungary financing takes place almost solely through bank channels. This dependency represents major vulnerability for the economy, since at times of credit crunch it renders substantially more difficult for companies to obtain funding. According to the estimates, reaching a capitalisation ratio of 30 percent may increase the economy’s potential output by 0.2-0.3 percentage point.

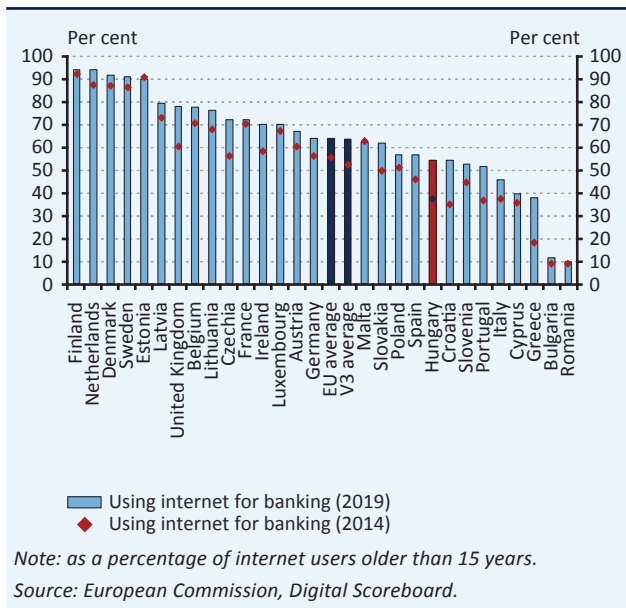
4.15 Corporate bond market capitalisation to GDP in the region



The MNB’s Bond Funding for Growth Scheme (BGS) was launched on 1 July 2019, which successfully increased the liquidity of the domestic bond market and fostered the diversification of corporate funding. The first corporate bond issuance and purchase by the central bank under the scheme took place in September 2019. Until the end of 2019, 15 companies issued corporate bonds under BGS, with a total face value of HUF 310 billion. As a result of this, the bond portfolio of non-financial corporations registered in Hungary rose from 1 percent of GDP, registered at the end of 2018, over 1.5 percent by the end of 2019. Despite the major growth, the value of the Hungarian corporate bond market as a percentage of GDP falls short of the average of the Visegrád countries, and thus there is still plenty of room for the further growth of the bond market.

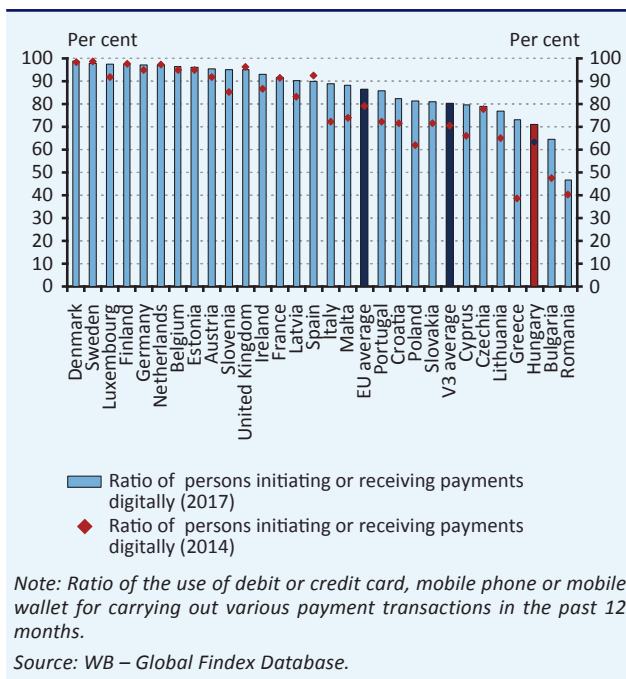
Bank digitalisation

4.16 Ratio of internet banking users in Hungary and in the European Union



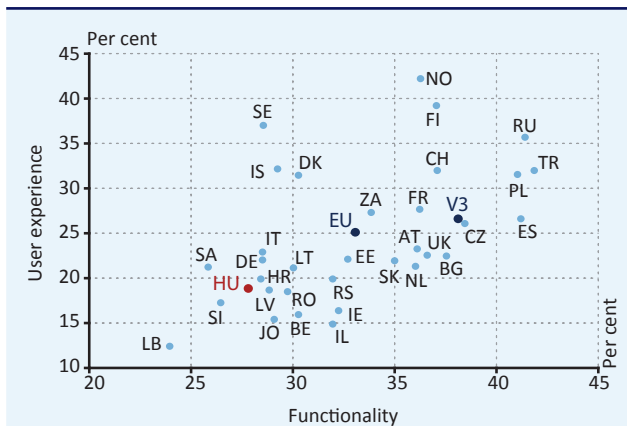
In Hungary the penetration of internet banking lags behind both the regional and the EU average. Last year, 54 percent of the Hungarian internet users used internet banking services, which lags behind the activity registered in all V3 countries. Although compared to 2014 Hungary was one of the countries where the penetration of internet banking rose to one of the largest degree – by more than 15 percentage points – there is still substantial room for expansion, since the vast majority of the European countries also registered a growth in recent years.

4.17 Use of digital payment methods in Hungary and in the European Union



In more than half of the EU countries at least 90 percent of the population use some sort of digital solution for the execution of payment transactions. By contrast, in Hungary only 71 percent of the population use digital assets, which puts it not only below the European average, but also below the average of the V3 countries. Although in three years the penetration of digital payment methods increased by more than 12 percent in Hungary, there is still room for development also in terms of the growth rate. In addition, it should be emphasised that in most countries the penetration of digital payment is typically lower among the young adults (age group of 15-24 years). Hungary – although it is still below the average – has better position in this respect than in the overall ranking, as it was ranked 19th on the EU list in the last observed year. The larger scale use of digital payment methods could be supported by the wide-ranging application of package pricing by banks and the phase out of the retail financial transaction levy.

4.18 Functionality of digital channels and digital user experience in the banking sectors of some countries

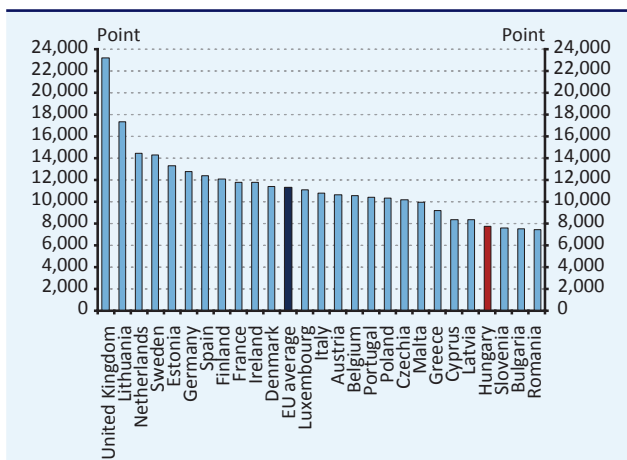


Note: The digital banking maturity, assessed on the basis of the survey performed by Deloitte, is a composite indicator comprising of three main pillars, which consist of the sub-pillars measuring the range of banking functions available in the digital space, the level of user experience measurable in digital interfaces and the consistency of digital development with consumer expectations. The EU data point shows the average of European banking systems.

Source: Deloitte (2018): EMEA Digital Banking Maturity 2018.

The digital maturity of Hungarian banks lags behind that of the European and regional banking sectors. There is also a major lag behind in respect of the banking functions available through the digital channel – internet and mobile banks – and the customer experience provided by the digital channels. Through the digital channels of the domestic banks, only 28 percent of the total range of functionality – including the collection of information related to the individual products, account opening, transaction initiation, use of new services and account closing – is available. By contrast, the average of the European banking sectors in this respect is 33 percent, while at some of our regional competitors – Poland and Czechia – the ratio of banking functions available in the digital space is even higher, i.e. 41 and 38 percent, respectively. Based on the consumers’ feedback, Hungarian banks also substantially lag behind the average of the European banking sectors in the customer experience provided by digital channels, i.e. easy use and convenient, smooth availability.

4.19 Assessment of the EU Member States based on the FinTech environment

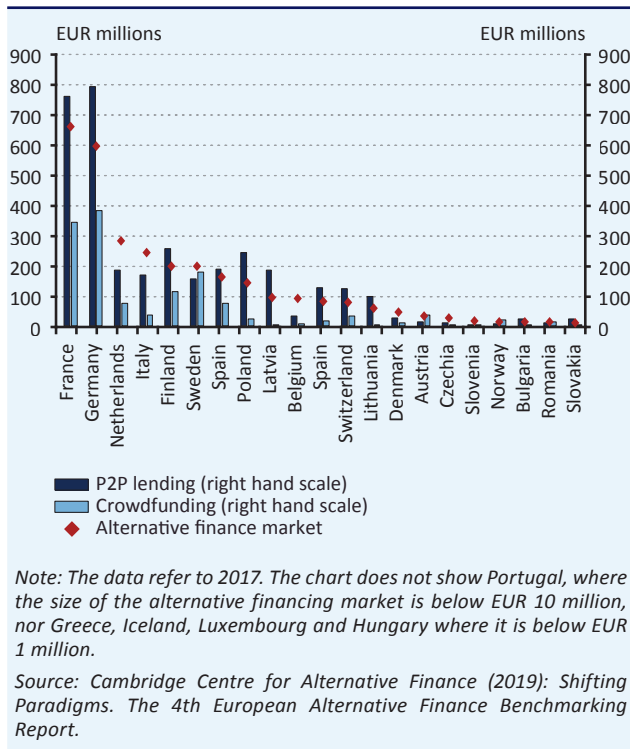


Note: Due to incomplete data, the survey does not contain Slovakia and Croatia, and thus they are also not included in the calculation of the EU average. The entire survey was wider, with a global scope, analysing 65 countries in total.

Source: Findexable (2019): The Global FinTech Index 2020.

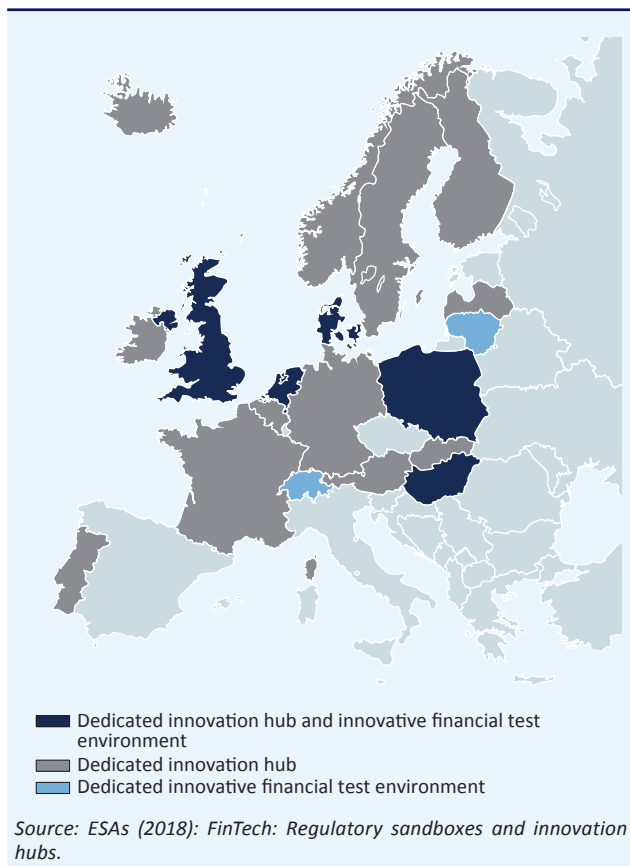
Although the regulatory authorities are strongly committed to the innovative development of the domestic financial sector, there is still substantial room for improvement in the development of the FinTech ecosystem. The 2019 survey of Findexable and Crunchbase shows that the activity and success of companies applying FinTech solutions, and the efficiency and maturity of the business environment in Hungary lag behind the EU average. In a regional comparison both Poland and Czechia outpace Hungary.

4.20 Size of the alternative financing markets in certain European countries



In Europe the use of alternative, online forms of finance are increasingly common both in the household and corporate sectors. In 2017, the entire European market – not including the United Kingdom – grew by almost 60 percent year-on-year, and realised a turnover of more than EUR 3 billion. The two segments of the largest weight are the peer-to-peer lending and crowdfunding, accounting for 56 and 39 percent, respectively, of the total European alternative finance market in 2017. The leaders in this respect in the continent are France and Germany. As regards the narrower region, fundraising from alternative finance markets started to grow dynamically in Poland and Austria. By contrast, in Hungary – mostly due to the absence of proper dedicated legislative framework – the internet-based alternative forms of financing have not yet appeared in a considerable volume. For the time being only the spread of bonus and donation type crowdfunding opportunities, less relevant for the business, can be observed.

4.21 Innovation hubs and innovative financial test environments



The MNB launched its consultation platform (Innovation Hub) in spring 2018, which provides the companies applying newly appearing FinTech solutions and the incumbents with assistance for finding their way in the domestic regulatory environment. In addition, the purpose of Innovation Hub is to develop cooperation among the market participants, the innovators and the authorities. Moreover, in December 2018, the MNB developed the regulatory sandbox, which facilitates the testing of innovative solutions in a real market environment, subject to complying with the requirements tailored to the respective financial institution and simultaneously using certain regulatory exemptions. The purpose of both programmes is to contribute to the innovative – and at the same time safe – development of the Hungarian financial system. Hungary is one of the few countries in Europe, where both innovative regulatory platforms are present, while most countries at present only have innovation hubs.

4.2 ACTIVATION OF HOUSEHOLD SAVINGS

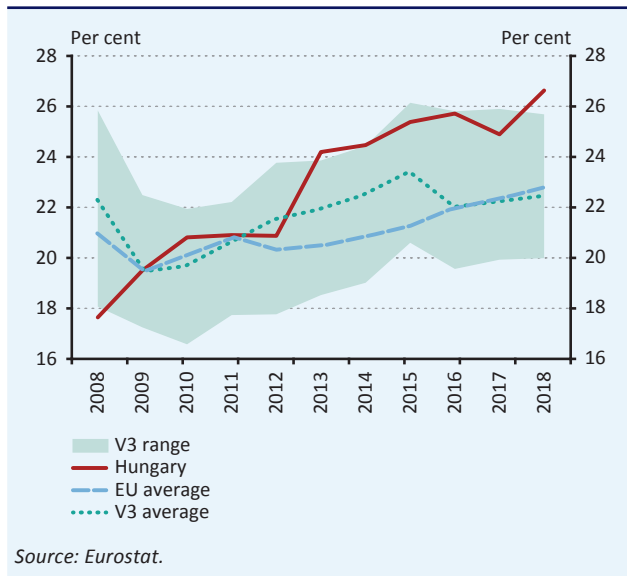
The financial crisis highlighted the fact that financing based on external resources entails a number of risks, and thus strengthening of domestic financing is of utmost importance, and at the same time also a condition for balanced convergence. Fast, but consumption-driven growth, financed from external resources and credits can make an economy extremely vulnerable. In line with this, the international examples and economic history experiences show that those convergence models proved to be successful where such long-term, growth supporting investments were implemented that predominantly relied on internal – mainly household – savings.

For the maintenance of the balance and the continuation of economic convergence, it is essential to keep household savings at a high level, in which the introduction of the Hungarian Government Securities Plus (MÁP Plus) has a key role. Prior to the financial crisis, Hungary struggled with funding difficulties following the growth financed from external resources. After the adjustment economic growth was realised under persistently high current account balance and decreasing external debt ratios. This is due to the fact that the funds necessary for the implementation of corporate investments were available due to the high domestic, household savings. Nevertheless, the maintenance of the balance in the long run is yet another challenge, since the periods characterised by the economies' convergence and high wage growth are usually accompanied by a decline in household savings; the signs of this have already appeared in Hungary as well, particularly in the case of government securities savings, which decreased since 2016 both in nominal terms and proportionally. In the light of the foregoing, it was of key importance to renew the household government securities strategy and introduce a new, attractive household government paper, which was MÁP+.

MÁP+ encourages households to increase their savings, which supports sustainable economic growth as well as financial and macroeconomic stability by stabilising the current account and mitigating the upwards effect of purchases of investment property on the price level. MÁP+ is able to divert the additional earnings realised under the fast wage dynamics, thereby supporting the maintenance of households' high savings rate. This is particularly important from two aspects: on the one hand – based on international examples – these savings may contribute to the financing of investments aimed at the improvement of competitiveness; on the other hand, the household financial savings have a key role in ensuring the balance of the current account. Furthermore, MÁP+ may compete with the real estate market investments, as it may be regarded as an investments of higher liquidity and less risk than the purchase of real estate.

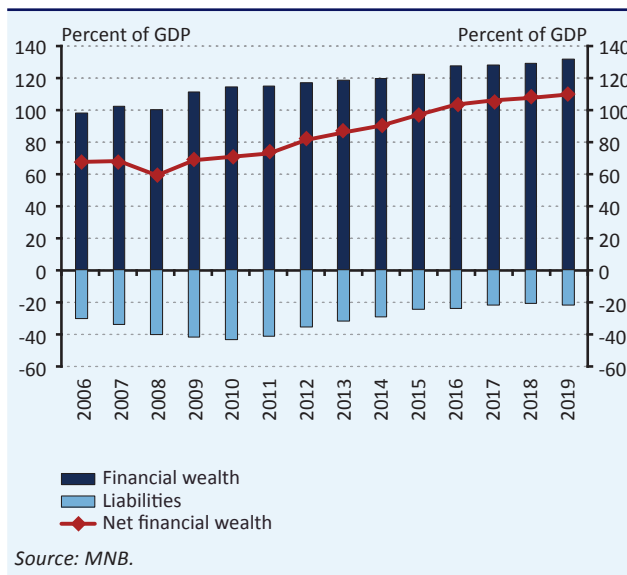
By reducing external financing and strengthening self-financing, the MÁP+ reduces Hungary's external vulnerability and improves its financing conditions. As a result of the MÁP+ purchases, the role of households in financing the general government increases, thus the ratio of external and FX financing within public debt declines, and the duration of the public debt financed by households becomes longer. However, it should be also noted that by transferring the public debt to domestic ownership, the paid interests also remain with domestic actors. This supports the country's income and current account balances, which reduces external debt and improves the balance position. All these factors have an important role also in the credit rating decisions, since as a result of these, Hungary's external exposure decreases and self-financing strengthens, which improves the country's financing conditions through the more favourable investor sentiment and the reduction of the risk premium.

4.22 Gross savings as a percentage of GDP



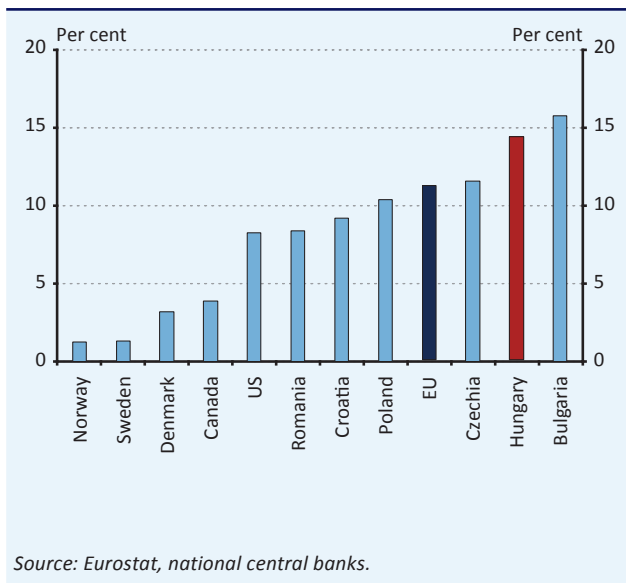
In the past decade, the Hungarian economy's available internal sources substantially increased. Prior to the crisis, domestic savings (defined as the difference of earnings and consumption) represented major vulnerability due to the dependency on external liabilities. The deleveraging by households (e.g. reduction of debts), the growth in earnings and the government measures (e.g. reduction of the personal income tax rate) equally contributed to the rise in savings exceeding both the EU and the regional average. In recent years, the tight labour market and the intense wage dynamics facilitated further improvement in households' savings position. Also due to the substantially growing corporate investments, Hungary's saving rate persistently exceeds the regional and the EU average. Households' high savings, in addition to the government's changeover to domestic financing, provide Hungarian corporate investments with major funding, which support the sustainable convergence of the domestic economy without external indebtedness.

4.23 Financial wealth of Hungarian households as a percentage of GDP



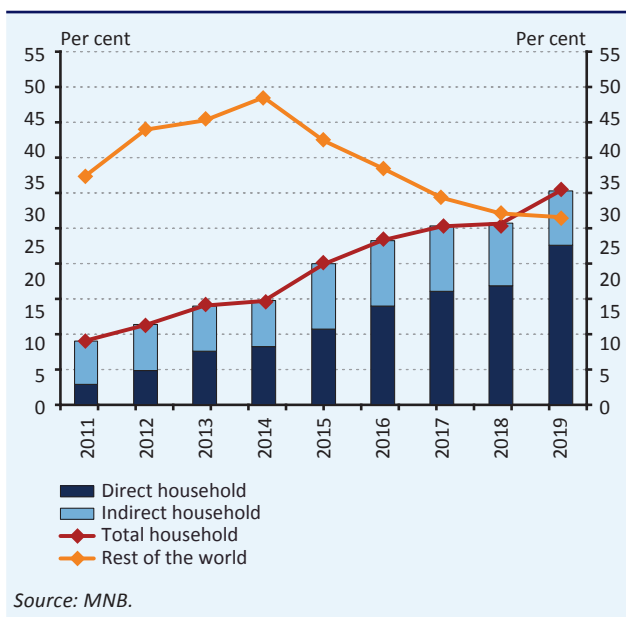
Households' net financial wealth, calculated as the difference of their financial assets and liabilities considerably increased compared to 2010. The high savings supported growth in financial wealth, and within that – in line with the government's financing strategy building on internal sources – households' government securities holding, in addition to shareholdings and cash, also rose dynamically. In 2019, within the securities the growth in long-term securities – following the introduction of the MÁP Plus scheme – was outstanding. Households' liabilities as a percentage of GDP halved after the peak registered in 2010, contributed to by the households' changed savings behaviour resulting from the crisis, the early repayment at preferential exchange rate, the conversion of foreign currency loans into forint and the one-off effects of the MNB's market regulation measures. In addition, the savings and wealth of households were also significantly increased by the governments' fiscal stimulus, employment improving and wage growth supporting measures.

4.24 Cash holding as a percentage of GDP in specific countries (2018)



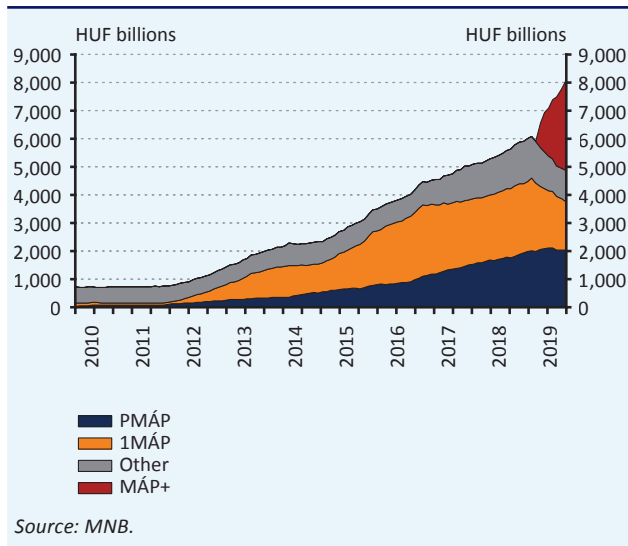
Hungary’s cash holdings are high in an international comparison, the mobilisation of which – already started with certain measures – may represent major sources for the economy. In the post-crisis low inflation and yield environment liquid assets became increasingly popular in most countries, and thus the rise in cash holdings as a percentage of GDP was a general phenomenon. Recently, several government measures were aimed at the deceleration of accumulation of cash assets: MÁP Plus, due to cheap redemption and high interest rate, represents a favourable alternative to savings in cash. The introduction of the new scheme is also supported by the enhancement of services (WebTreasury, mobile applications, HST offices) and the reforms, also proposed in the Competitiveness Programme (capitalisation of interest, cancellation of the financial transaction levy for the Treasury). In addition, the technical innovations (e.g. the introduction of the instant payment system) reduced the cash holdings through the decline in transaction demand for money.

4.25 Financing based on security holdings of households and non-residents as a percentage of public debt



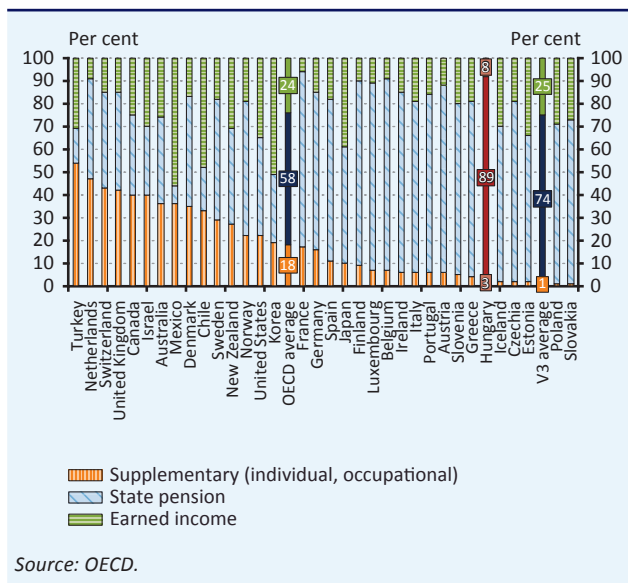
Owing to the measures reducing external vulnerability, the significance of external liabilities in the financing of public debt gradually decreased. In line with new strategy, building on internal sources, the households’ government securities holding continuously grew in the past decade: with direct financing, by the end of 2019 it rose to 26 percent of the public debt from the level of 2-3 percent registered in 2011. If indirect financing, i.e. through financial intermediaries, is also taken into consideration, this ratio was almost 35 percent at the end of last year. The increasing participation of the households in the financing of the public debt made major contribution to the fact that by the end of 2019 the government securities holding of non-residents declined close to 30 percent from 50 percent registered in 2014. In addition to the strategy of the Government Debt Management Agency, which focuses on financing by households, the central bank’s self-financing programme also made major contribution to the strengthening of the role of internal sources by fostering the purchase of government securities by banks.

4.26 Households' holdings of government securities



Households' government securities holding increased almost tenfold in the past eight years, and within that last year it rose by more than HUF 2,200 billion in one year, and thus by the end of 2019 it exceeded HUF 8,000 billion. The reform of the household government securities strategy, strengthening the domestic investor base and the introduction of MÁP Plus in June 2019 played dominant role in the dynamic growth. The subscription received outstanding attention throughout the year, owing to which by the end of the year the MÁP Plus holding exceeded HUF 3,100 billion. In parallel with this, the one-year Hungarian government securities (1MÁP) are characterised by redemption and partial rollover of the maturities already since May 2020, and then from November 2020 (since the fall in the securities' premium exceeding inflation) the Premium Hungarian government securities (PMÁP) registered redemption and falling demand. As a result of this, the new scheme has become the household government securities with the largest stock, which points to a growth in the duration of the government securities holding of households. All this is favourable in terms of the public debt's ownership and maturity structure, and the country's external vulnerability.

4.27 Breakdown of old-age income (2018)



In Hungary the main source of the old-age income is the state pension. Accordingly, the domestic system is essentially single-legged; pension savings and the incomes from those fall short of the level observed in developed countries. The present voluntary savings schemes (voluntary pension fund, pension insurance, pension savings account) together reach merely 20-25 percent of the employees. This also contributes to the fact that almost 90 percent of the income of Hungarian pensioners comes from the state pension scheme, further 7-8 percent is earned income, while pension supplementing savings merely account for 3 percent. There is room for development by increasing in the inflow of savings to the supplementary scheme; to this end several countries have already elaborated their development concept, while Poland has already started to implement its reform related to the supplementary pension scheme.

4.3 SME STRATEGY

The competitiveness of enterprises and within that the prosperity of the SME sector constitutes the basis for economic development. Until now, Hungarian enterprises have usually joined international value chains, in which they could progress by increasing their productivity, through their low labour cost. To meet the modern challenges (e.g. labour shortage, digitalisation), it is indispensable for businesses to implement sufficient investment and to have an adequate business environment available for this.

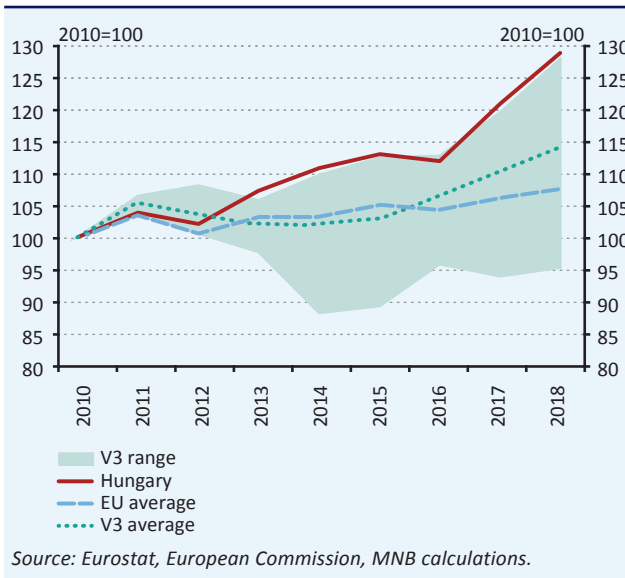
In recent years there was a positive change in the productivity of SMEs, supported by a number of government measures. Between 2010 and 2018 the labour productivity of Hungarian SMEs rose by almost 30 percent, which is roughly twice as high as the average of the – also fast growing – Visegrád region, and four times higher than the EU average. The government measures mostly exerted their effect on the demand side, part of which – due to the increased purchasing power – appeared in a concentrated form in the outstanding performance of a few sectors (construction, retail), while another part of it affected the entire economy. These include, among other things, the more favourable lending conditions, the central bank's targeted stimulus programmes, the enhanced allocation of EU funds to economic development and the second-round effects of the inflow of foreign direct investments. The reduction of the limit for the investment tax allowance is also a positive development, as it is now available also to smaller enterprises.

The outstanding performance of the small and medium-sized enterprises was also supported by the tax regime. In the period under review, the total corporate tax and contribution rate decreased to the largest degree in Hungary. In addition, small enterprises may also apply special forms of taxation, of which the tax rate of the small business tax (KIVA) declines in parallel with the decrease in the social contribution tax since 2016. There is still room for further development, since in terms of time spent on tax administration Hungary still lags behind the EU average.

As a result of the fast development of SMEs in the past 2 years, duality eased, i.e. the gap compared to large corporations; however, the difference is still considerable both in terms of productivity and wages. The productivity difference between large and smaller corporations is a natural phenomenon, which can be observed in all countries. However, in Hungary this difference is above the average, one reason for this is that the productivity of foreign-owned large corporations is well above the national average, while the efficiency of small and medium-sized enterprises is improving, but it is still very low. The consequence of this is that in the tight labour market, it was more difficult for the small enterprises to offer attractive conditions to employees than for large corporations. Of the countries under review, advanced technologies – such as Big Data, 3D printing and industrial robots – are used by SMEs the least in Hungary. In addition, they also spend less on IT security than the companies of the peer group, and there is also room for improvement in the area of organisational innovations. Naturally, the productivity of small enterprises can be improved primarily through their own investments, technological and other developments, but the state is also able to support this development with its own tools.

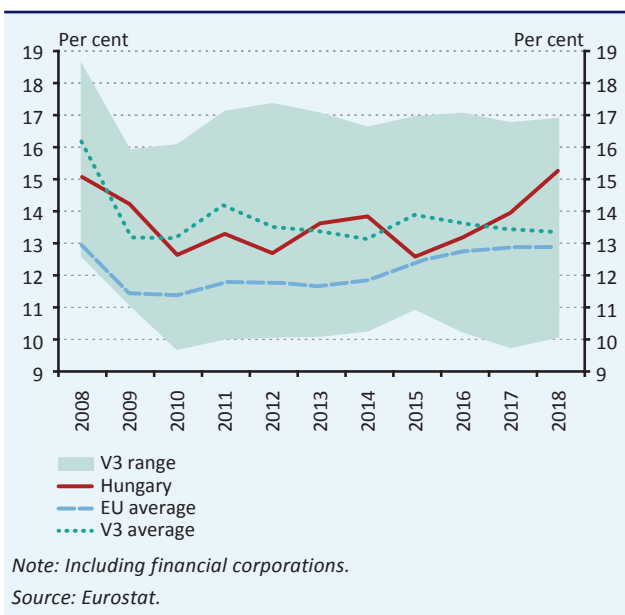
In addition to the problems of economies of scale and generation change, young people's willingness to start a business may also represent a bottleneck. Hungarian university students typically do not intend to start a business after obtaining their degree; however, when asked about their 5-year plans, their potential willingness to start a business is substantially less negative. This highlights the importance of the first job, since it has major influence on the future entrepreneurship. The maintenance of the intention is supported, if the career-starters acquire skills at the first job(s), which they can utilise later as entrepreneurs.

4.28 Labour productivity of small and medium-sized enterprises



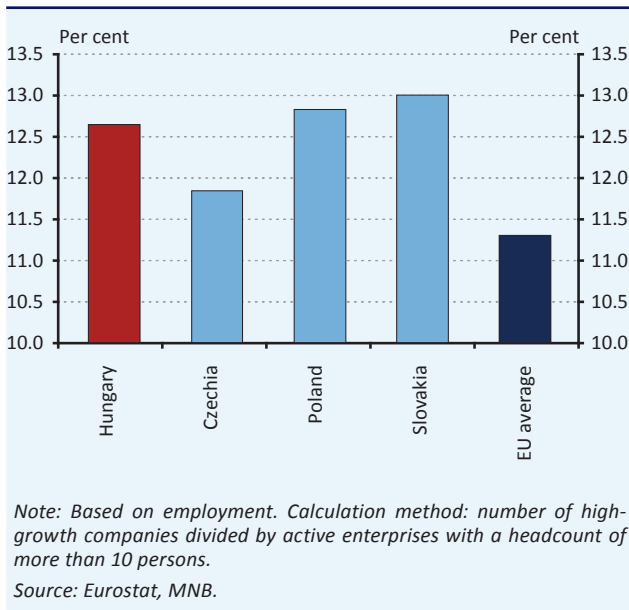
The real productivity of the Hungarian SMEs rose by roughly 30 percent since 2010. Within that, since 2013, with the exception of one year, the growth in the SME’s labour productivity exceeded the average of both the EU and the V3 countries. In 2017 and 2018, as a result of several successful economic policy measures, the Hungarian small and medium-sized enterprises achieved one of the fastest growth. However, roughly half of the gains in productivity recorded in 2018 was attributable to construction, which was able to grow to such a degree mostly as a result of cyclical factors (high demand), government measures (5 percent VAT on housing, infrastructure projects). Within the SME segment the improvement of productivity was the largest at the micro enterprises, followed by the small and then by the medium-sized enterprises.

4.29 Business investment to GDP ratio



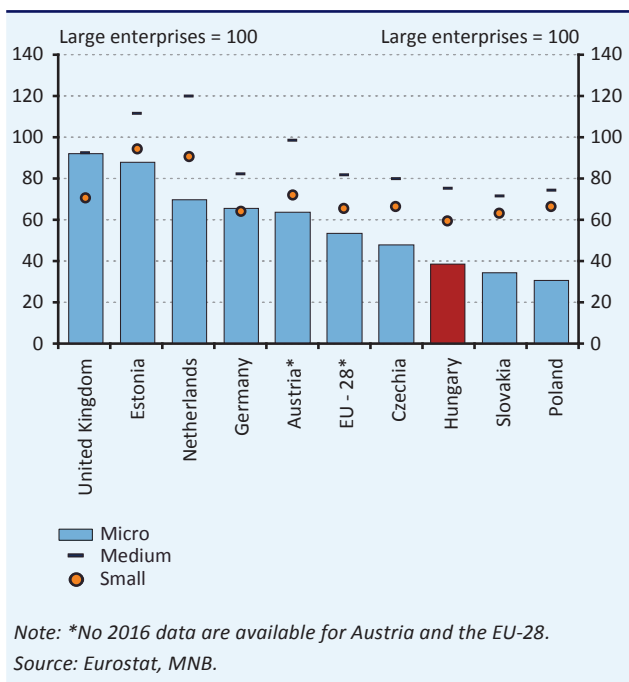
The key focal point of productivity growth is capital deepening, i.e. the relative rise in investments. The increasing of the investment spending in excess of depreciation enables corporations to increase their productivity. In Hungary, after 2015 the business investment to GDP ratio substantially increased, which also contributed to the favourable growth trends observed in the SME segment. The growth in investment activity was supported by the favourable financing environment, the inflow of foreign direct investments, the targeted central bank programmes (FGS), the EU funds and the high domestic demand supported by the government.

4.30 Ratio of high-growth companies (2017)



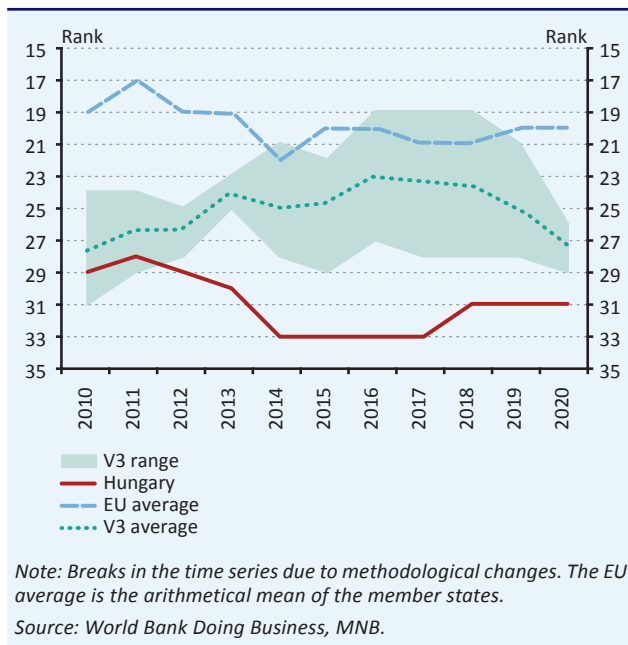
The ratio of high-growth companies shows the ratio, within the total corporate population, of companies employing minimum 10 persons that increase their headcount by at least 10 percent for 3 years. The positive development in the Hungarian ratio was also supported by government measures. In Hungary, the targeted labour demand stimulating measures of the 2013 Job Protection Action Plan and the processes supporting high demand (improving financing environment, family support measures, FDI inflow, EU funds) also had favourable impact on the domestic value, which rose above 12 percent by 2017. Hungary managed to achieve this high ratio despite the fact that in 2016 and 2017 already tight labour market conditions prevailed, and in the new EU budget cycle it was no longer a mandatory requirement to increase the number of employees when corporate applications were granted.

4.31 Labour productivity advantage of large corporations compared to SMEs (2017)



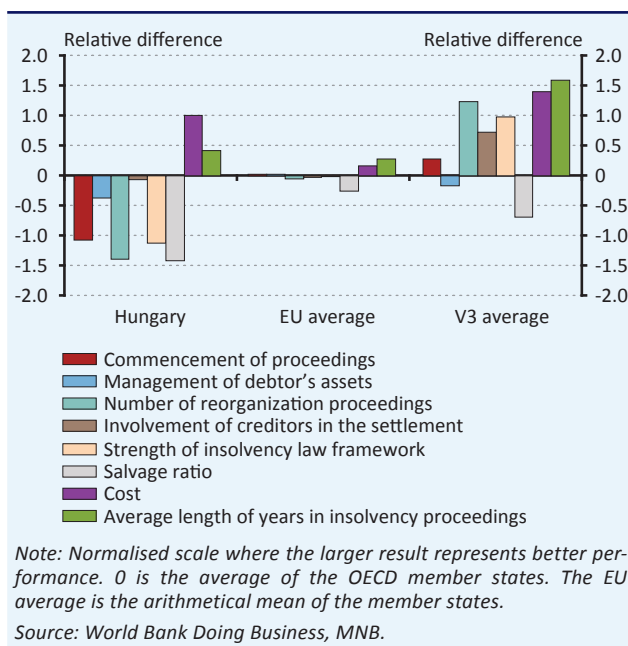
As a result of the fact that in the past period Hungarian small and medium-sized enterprises achieved outstanding productivity growth, the disadvantage of SMEs compared to large corporations started to decrease. Although the advantage is still almost twofold in 2017, within 8 years the SMEs' productivity came closer to that of the large corporations by 20 percentage points. As a result, Hungary reached the V3 average, but the EU average still appears to be a distant target (where the productivity of large corporations exceeds that of the SME segment by one and a half times). The lag behind the EU average is particularly large in the area of micro enterprises. The example of some of the member states also evidence that corporate size is not always in direct proportion to productivity. In Estonia and in the Netherlands, the productivity of medium-sized enterprises exceeds that of the large corporations, and even the small enterprises are able to operate with similar efficiency.

4.32 General assessment of the business environment: ranking among the OECD countries



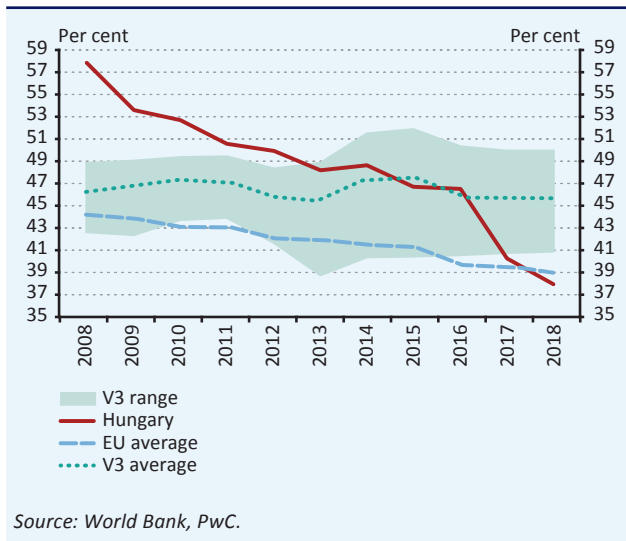
The enterprises manufacture and/or render services under a number of factors that determine the operation of the company, but the management cannot influence directly, which cannot be quantified in the production accounts. The most important of these include the state regulation and the infrastructure. The World Bank’s Doing Business index attempts to quantify these factors. Based on the latest publication, since 2014 the Hungarian regulatory and infrastructural environment moderately improved. Nevertheless, the Hungarian result is still below the regional average and also falls short of the EU average. The largest lag can be identified in the bankruptcy regulation and the protection of minority investors. At present Hungary is ranked 52nd (31st among the OECD countries) in the Ease of Doing Business ranking, while Slovakia, Czechia and Poland are ranked 45th, 41st and 40th, respectively.

4.33 Indicators of insolvency regulation (2020)



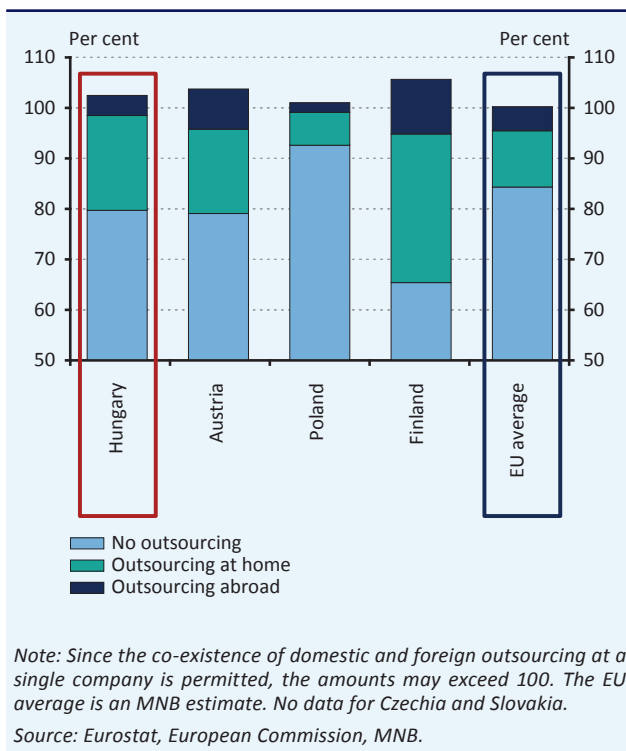
Of all pillars of the Doing Business survey, the area that needs to be improved the most in the Hungarian business environment is the insolvency regulations, while the V3 countries are more successful in this dimension than an average EU Member State. The greatest lag is in the number of the reorganisation proceedings, the strength of the bankruptcy law and in the salvage rate. As a result, if the Hungarian companies get into trouble, they can expect slower proceedings, lower salvage rates and higher costs than their regional competitors. Moreover, creditors also have less chance to recover their outstanding receivables. Ultimately, the Hungarian insolvency regulation may reduce entrepreneurship, since the restart is likely to be longer and more difficult than for the regional competitors.

4.34 Total tax rate of enterprises as a proportion of commercial profit



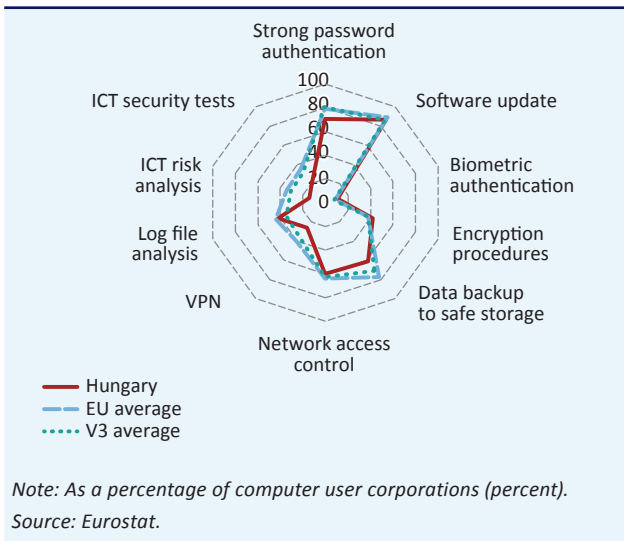
The tax regime is a determinant component of the business environment. Based on the Doing Business survey, the tax burden of enterprises in Hungary is slightly favourable than the EU average and much more favourable than the regional average. One important reason for this is that since 2017 Hungarian companies pay the lowest corporate income tax in the EU. In addition, in the past 3 years the efficiency of tax audits improved, and public dues charged to labour substantially decreased (from 2017 social contribution tax cut in multiple steps). In addition, the changes in the regulations applicable to small taxpayers also represented major easing for the enterprises (simplification of the small taxpayers' itemised lump sum tax (KATA) and of the small business tax (KIVA), and cutting the rate of the latter).

4.35 Outsourcing at the enterprises (2018)



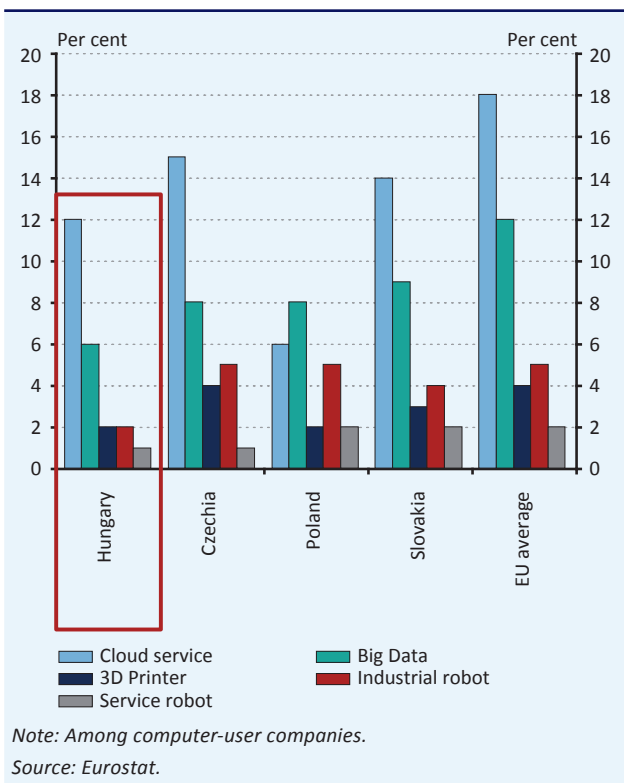
Organisational innovation can be interpreted broadly as all process organisation changes (whether internal or external) that improve the results of the entity belong to this category. In this respect Hungary falls short of the EU average by 8-10 percentage points on average (roughly one quarter of the SMEs with headcount over 10 are innovative). Outsourcing is a particularly important aspect of organisational innovations, since in this way companies may save costs, which helps them increase their productivity. In Hungary 80 percent of the companies do not outsource any activity, which roughly corresponds to the EU average. Most of the outsourced activities take place in Hungary, while outsourcing abroad is negligible at the Hungarian companies.

4.36 ICT security measures of SMEs (2019)



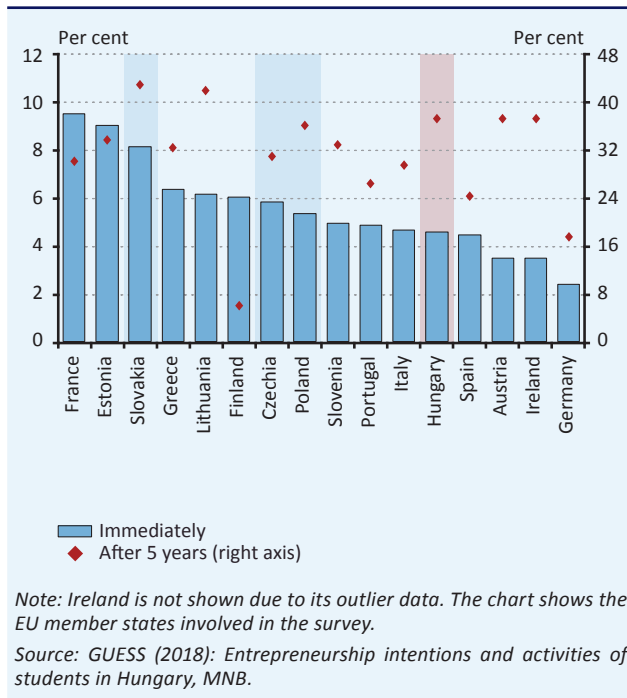
In the middle of the '90s and 2000s, the usage of computer was a good indicator of high productivity in certain sectors. With the technological progress, already more than 90 percent of the companies use computers in one phase or another of the operation. This takes place almost without exception along with an internet connection, and thus by now these facilities do not represent competitive advantage. By contrast, the resources spent on ICT risks represent the new productivity indicator. In this respect, Hungarian companies underperform, for example, in the safe data backup, use of virtual private network (VPN) and the conduct of ICT risk analysis procedures. However, there are major shortcomings throughout the EU in the area of ICT security.

4.37 Use of advanced technologies by SMEs (2018)



Digitalisation and the spread of the internet created a wide range of derivative technologies, the use of which improves the productivity of companies. Hungarian SMEs typically use these advanced technologies to a lesser degree than the companies in the V3 countries or the typical enterprises in the EU. There is a significant lag in the use of industrial robots compared to the also highly industrialised Czechia or Slovakia. This may be attributable to the fact that there are more SMEs in the manufacturing sector in these two countries, while in Hungary the sector is typically dominated by larger companies (the chart shows the SMEs; as regards large corporations, Hungary outperforms the EU average). The utilisation of Big Data, as the future's factor of production, is also scarce among the Hungarian SMEs.

4.38 Entrepreneurial intentions of Hungarian university students (2018)



Hungary faces challenges in terms of the rising generations of entrepreneurs. According to an international survey, 95 percent of Hungarian university students intend to work as employees after graduation. This is one of the highest value among the surveyed countries (GUESS, 2018). However, when students were asked about their plans 5 years after graduation, the indicator showing the willingness to start a business substantially increased. Accordingly, students usually first want to gain experience and then start a business. The results of GUESS survey confirm the importance of the first job in respect of the future entrepreneurship. In this respect, it is the corporate value chains involved in a wide range of business activities that have the chance to bring up young people who start their own business later (this is more typical of Hungarian-owned companies).

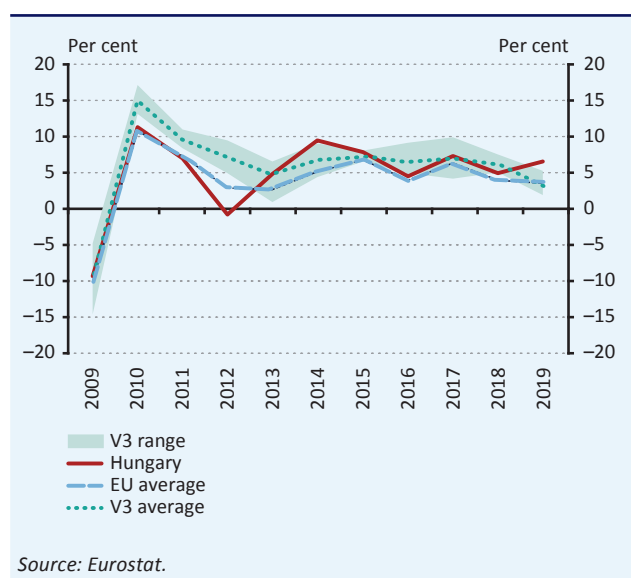
4.4 FOREIGN TRADE

For small open economies the increase in exports is one of the fastest ways of economic convergence. However, the width of the base underlying foreign trade and the expansion thereof is also important. In Hungary, roughly 40,000 SMEs export; their performance substantially determines the country's competitiveness and the competitiveness of the country also determines the prospects of exporters.

As a result of its historic and geographic attributes, Hungary is an open economy, and thus it considerably depends on the external trends both in cyclical and structural terms. It has numerous favourable effects that some of Hungary's larger sectors involved in foreign trade (primarily car and electronics, dominated by foreign companies) are extremely competitive; however, these sectors are integrated in the domestic economy only to a limited degree. The manufacturing companies (most of which produce for export) mostly source their production from imports. Meanwhile, in Czechia and Slovakia – having a similar economic structure – the ratio of factors originating from domestic sources is more favourable. As regards the long-term development potential, the structure of the economy may be deemed favourable when the multinational corporations, accounting for a vast part of Hungarian exports, work with an increasing ratio of domestic suppliers and Hungarian value added.

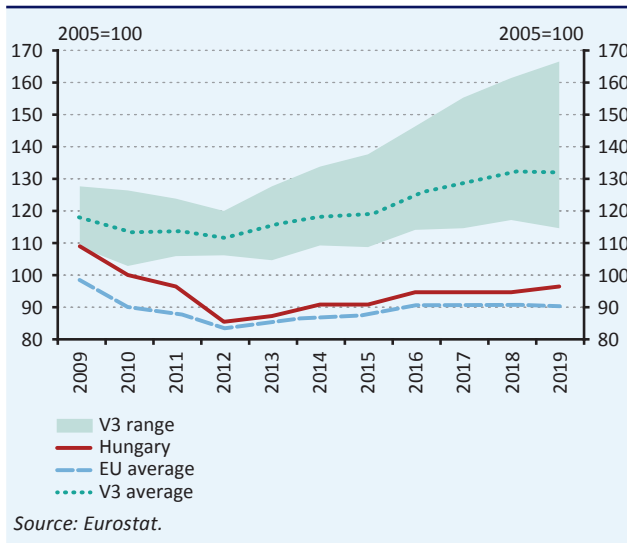
In Hungary the 20 largest companies account for almost 30 percent of the exports, while in Czechia and Poland roughly half of the exports is concentrated to such a degree. On the other hand, Hungarian SMEs exceed the Czech and Slovak figures in terms of export activity: in Hungary, roughly 7 percent of the SMEs export, while in Czechia and Slovakia only 1.5 and 5 percent, respectively, of the sector is engaged in exports. The Hungarian export to countries outside the European Union accounts only for the smaller part of total exports, but it is advantageous that export value per company is similar as in the case of trade within the EU. This is not typical either in the V3, or in the EU countries. As regards Hungary's exports outside the EU, it is a potential competitive advantage that Hungary is located halfway between the advanced Western markets and the developing Balkan and Eastern markets.

4.39 Annual changes in exports



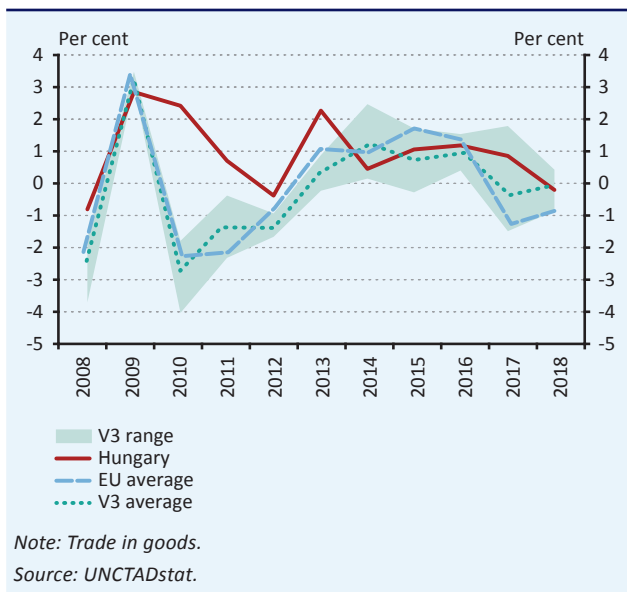
Due to its open structure, the performance of the Hungarian economy considerably depends on exports. As a consequence of the strong export dynamics, in the past 10 years the contribution of trade balance to GDP was mostly positive. By contrast, partly due to the high base and partly to the dynamically increasing domestic demand, in 2018 and 2019 the contribution of trade balance to growth was negative.

4.40 Export market share (share in global exports)



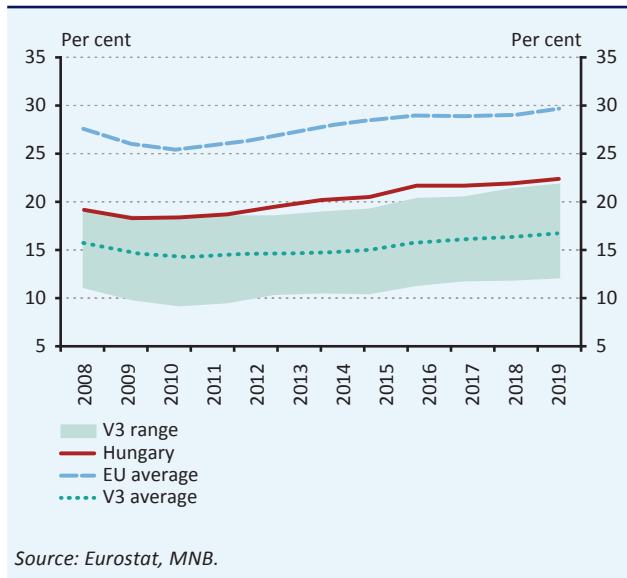
At present, Hungary roughly accounts for half percent of the world's exports, while the aggregate weight of the V4 countries in the global economy is 3 percent. In the past years, each of the Visegrád countries has been able to increase their market share above the EU average. During the crisis, Hungary's performance declined to a larger degree than its competitors, but there was a turnaround from 2013. Thereafter, the growth in export market share lasted until 2016. From 2016, domestic demand became the driver of the economy, and export dynamics was slower than the average of the Visegrád region; however, in 2019, the dynamics of Hungarian exports exceeded that of the Visegrád countries.

4.41 Annual change in terms of trade



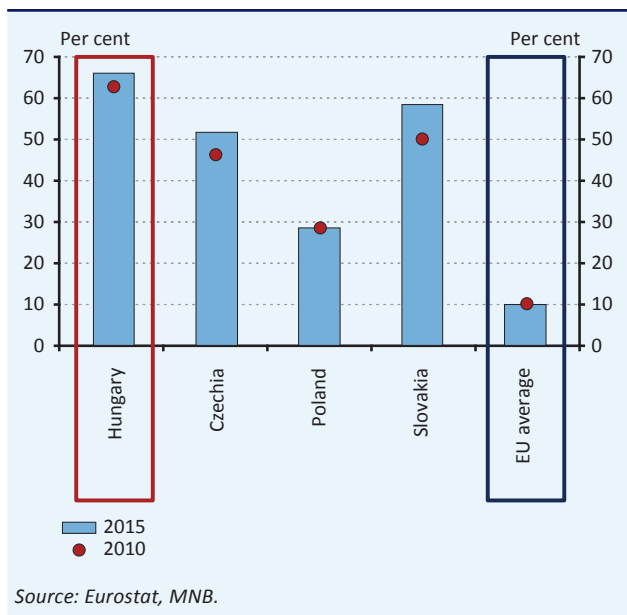
The terms of trade, i.e. the developments in export and import prices relative to each other, also indicates competitiveness. For example, persistent decline (beside oil price shock) in the terms of trade may also indicate structural problems. By contrast, persistent improvement in the terms of trade supports real convergence. The more open an economy is, the more important the positive development of exchange trends is. Therefore, it is advantageous that the terms of trade in Hungary followed an improving trend in recent years, i.e. the growth in export prices exceeded that in imports, with the exception of 2018.

4.42 Share of services within exports



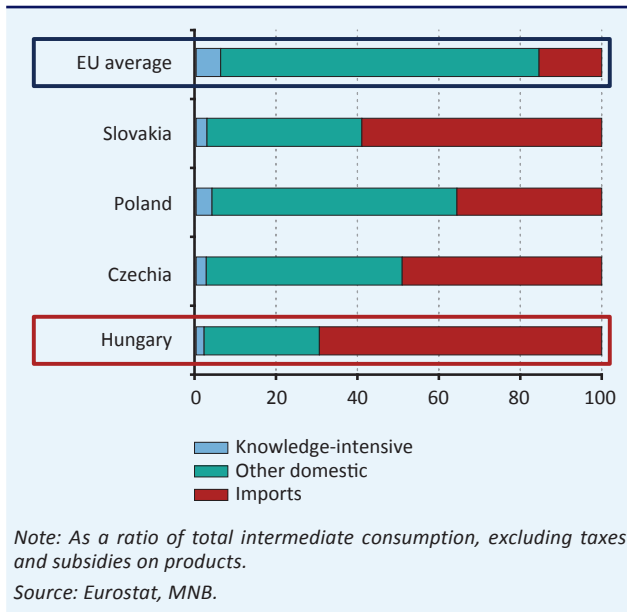
It is typical in case of advanced economies that services account for an increasing part of their exports. The strength of this export group is not only that it has high domestic value added content, but also that it is more resistant to crises than exports of goods, exposed both to cyclical and structural factors. In addition, the flow of services cannot be hindered by the classic customs and does not depend on logistics barriers either. In Hungary, the deindustrialisation after the political transition was followed by manufacturing FDI, and thus the weight of services significantly declined. Following the EU accession, the way to the common market opened primarily to wholesale and logistics services, while recently ICT, and professional and administrative services can also contribute to the strengthening of exports in services. The appearance of service centres (BSCs and SSCs) also play an outstanding role in the process. At present, services account for more than one fifth of Hungarian exports.

4.43 Direct import content of value added (2015)



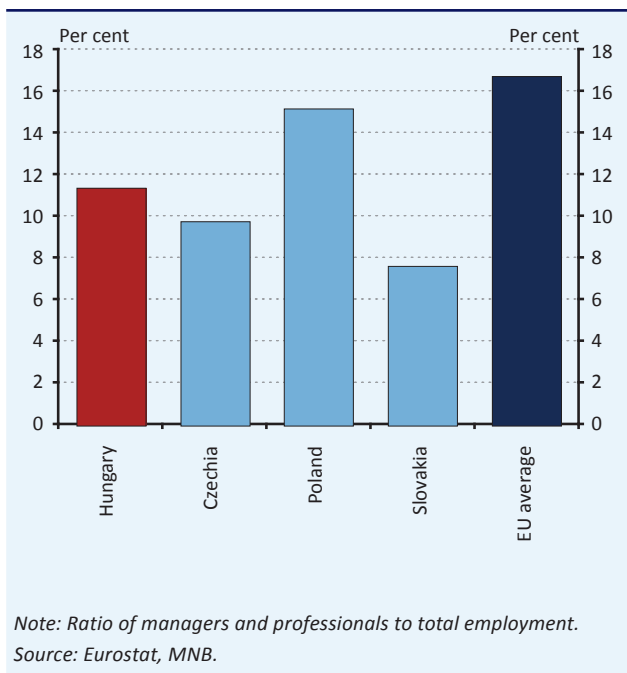
Where there are wide-ranging domestic supplier relations, the domestic ratio of the value added is also higher. On the other hand, the higher the import ratio in production is, the less wide-ranging the supplier relations are. The region did not succeed in reducing import dependency between 2010 and 2015, which may be linked to the continued, steady import-intensive FDI inflow. On the one hand, in the member states that are more developed than the EU average the supply chains are longer, and on the other hand the weight of manufacturing is lower, and thus import absorption is also smaller.

4.44 Decomposition of manufacturing production by use (2015)



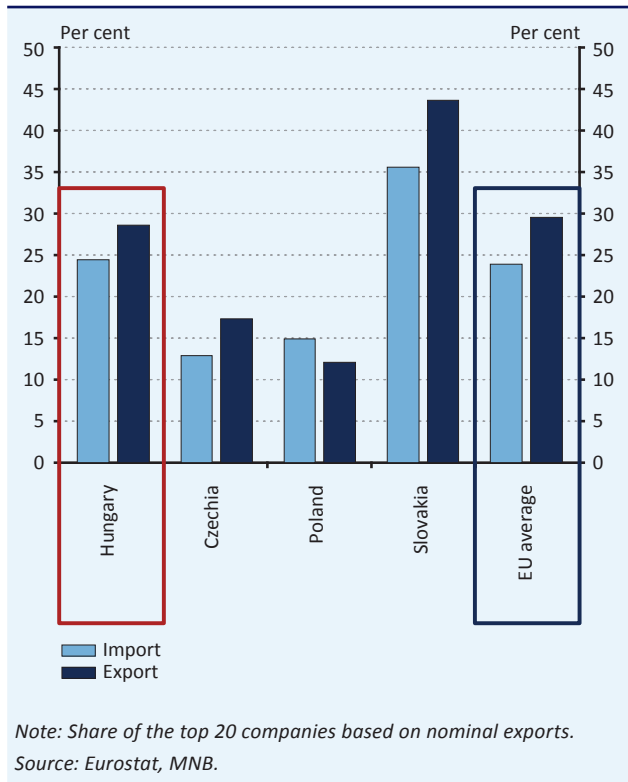
The production structure of manufacturing is determinant for competitiveness, because after the political transition it became a key to growth. Based on the available data, in Hungary manufacturing is integrated in the economy to a lesser degree. A large part of the foreign-owned companies operating in the sector use little domestic input and do not use the knowledge-intensive services either. Slovakia is in a similar situation as Hungary, while in Czechia and Poland domestic contribution is much larger. In the region, the absorption ratio of knowledge-intensive services is low. This is a priority area for development, since this could be a breakout point for the V4 region and particularly for Hungary, which countries are essentially poor in natural resources.

4.45 Ratio of knowledge-intensive employees – manufacturing (2019)



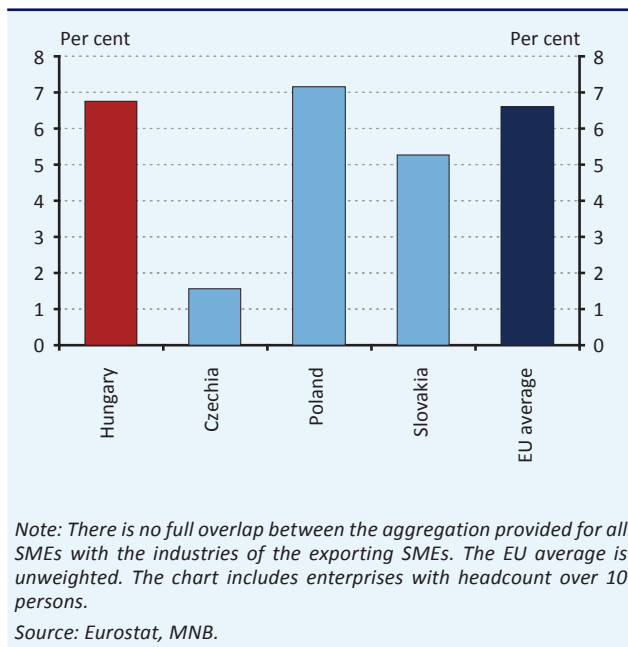
It is often mentioned about Hungary that it has high-tech export structure. This can be fully confirmed when examining the industrial or product structure data, since the pharmaceutical, electronics and machinery products indeed have a high weight in exports. However, in Hungary and in the V4, the ratio of workers employed in knowledge-intensive jobs is below the EU average. An essential condition for moving towards activities of higher value added is having as many highly qualified employees and managers in manufacturing as possible.

4.46 Foreign trade concentration index – Top20 companies (2017)



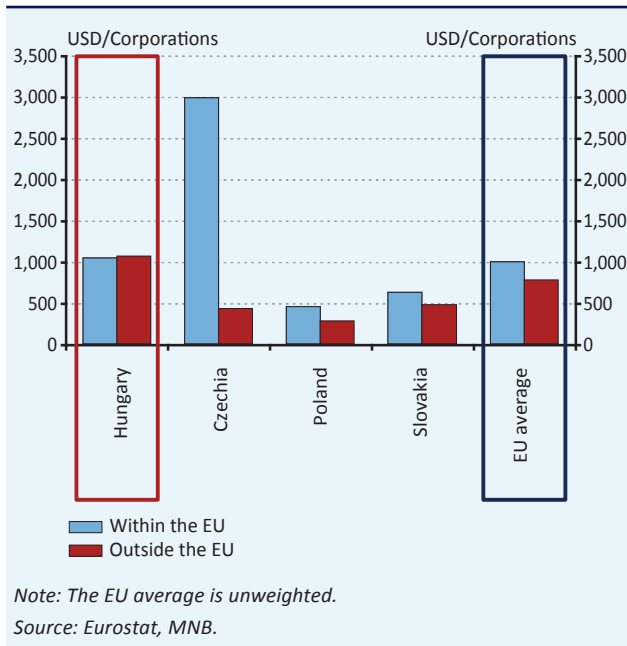
In addition to the aggregated level of exports, the range of its breakdown is also important. If it is concentrated, then fewer companies may be deemed competitive also at an international level, while if it is wide-ranging, then the entirety of the national economy is competitive internationally. The concentration of Hungarian exports is similar to the European average, which is illustrated here by the weight of the Top 20 exporter (and importer) companies in foreign trade. However, foreign trade rests on a more even base in Czechia and Poland than in Hungary or Slovakia.

4.47 Ratio of exporting SMEs (2017)



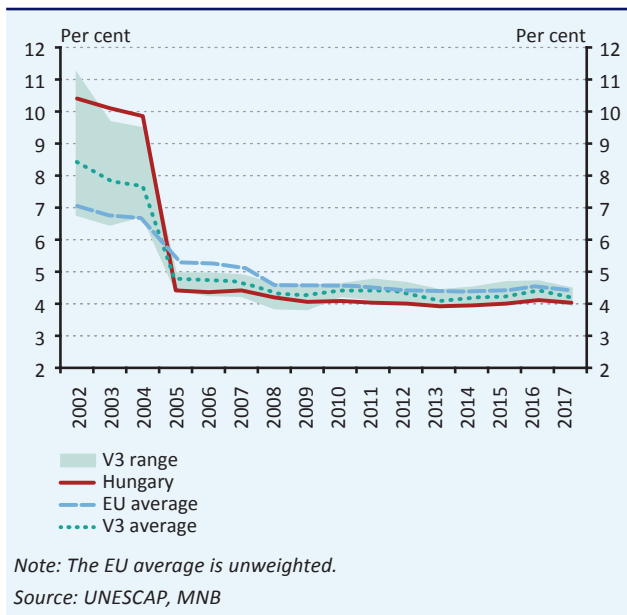
As regards the entire population of small and medium-sized enterprises in Hungary, relatively many SMEs export. The Hungarian ratio roughly corresponds to the EU average, and due to the low Czech value, it also exceeds the V3 average. 70 percent of the 38,000 exporter Hungarian SMEs qualify as micro enterprise. It should be noted that the statistics contains only the companies that appear in the foreign market independently. In fact, the presence of the Hungarian SMEs through the supplier chains may be substantially larger. Looking ahead, if an increasing number of the SMEs are able to appear in the foreign markets independently as well, it may increase Hungary's competitiveness.

4.48 Average export values by SMEs (2017)



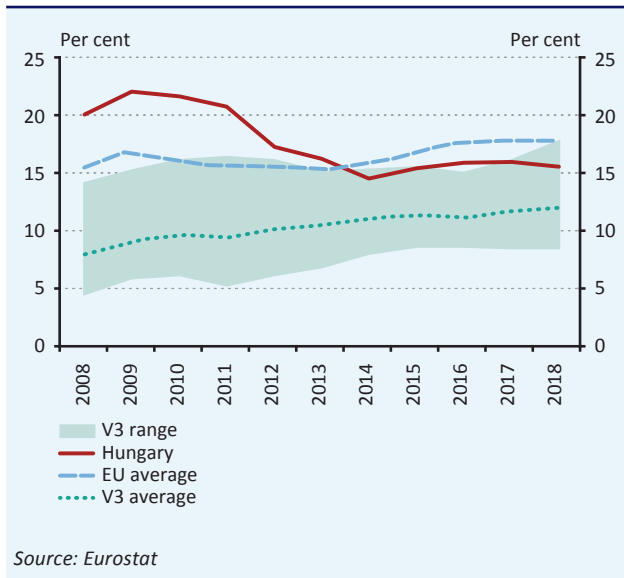
The Hungarian SMEs successful in exports are able to accept orders of relatively high value. In Hungary, the value of export per SME slightly exceeds the EU average, and – with the exception of the Czech outlier – also that of our regional competitors.

4.49 Average tariffs in foreign trade



The foreign trade conditions can be categorised as tariff based (customs type) and non-tariff based (regulatory nature). In view of the fact that non-tariff obstacles represent a category of assessment difficult to quantify, the chart shows the average customs duty characterising the individual bilateral relations. Within the region, it was Hungary that benefited the most from the accession to EU, as the average customs burdens of Hungarian traders were immediately halved. The other Visegrád countries also registered a major decline, which, however was lower than that in Hungary. In the post-accession years the average customs burden declined further in the region only slowly. The customs burden of the region, and within that of Hungary, being lower than the EU average, signals the integration in the global value chains.

4.50 Ratio of high-tech export in total exports



International demand for products of high technical complexity may be deemed stable in the long run, and thus the exports of technology-intensive products contributes to the competitiveness of the country. Since 2013, Hungary is no longer regarded as a particularly technology-intensive production base due to the decline in electronics manufacture (an emblematic milestone of this was the closing of the Nokia factory in 2014). As regards the production processes Hungary faces a heterogeneous situation: while complex technologies promise a number of spill-over opportunities for domestic suppliers, technology-intensive companies in our region typically conduct assembly activities, which deteriorates competitiveness.

4.5 LABOUR MARKET

One of the most important determinant factors of economic growth, convergence and competitiveness is the human capital, in addition to physical capital and total factor productivity. Quantitative and qualitative attributes of human capital affect economic growth through several channels. On the one hand, through labour force available in economy, measured by the activity, employment and unemployment rates. On the other hand, through productivity of employees which is essentially determined by education level and health status.

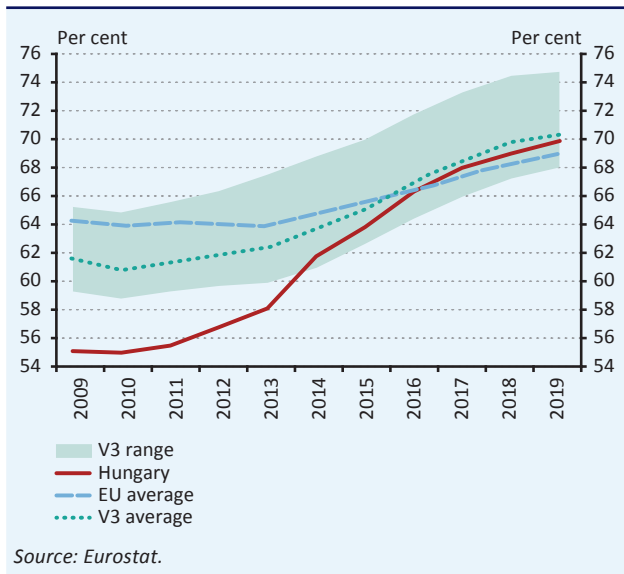
In Hungary, labour market hindered the growth potential of the economy in the years before and during the 2008 financial and economic crisis; however, the past years' favourable labour market trends made major contribution to growth. From 2010, as a result of the measures aimed at the recovery from the economic crisis, employment started to rise, in parallel with which economic growth also restarted. The positive turn in labour market was substantially attributable to the government measures aimed at employment growth. The most important means of this was the significant shift in the focus of domestic tax centralisation from labour taxes to consumption taxes. The rise in labour demand was supported by the introduction of the Job Protection Action Plan, the significant reduction of capital taxes and directly by the public employment scheme. The supply side of labour market was supported by the introduction of the flat personal income tax rate, the introduction and continuous extension of the family tax base allowance tied to employee relationship, and by the rationalisation of welfare transfers.

The number of people employed rose by about 800,000 persons between 2010 and 2019. In recent years, the Hungarian employment rate registered one of the largest growths in the European Union, and by 2016 it reached both the regional and the EU average. In parallel with the significant growth in employment, the unemployment rate substantially decreased, the level of which is more favourable than the EU and the regional average. The growth in employment resulted in a gradual decrease in labour market reserves and the tightening of the labour market. During the recovery of the labour market from the crisis, the ratio of part-time employees increased, followed by a decrease in recent years. Part-time employment in Hungary is one of the lowest in a European Union comparison.

Despite the considerable rise registered in recent years, the Hungarian average wage still materially falls short of the European Union's average. The powerful underlying wage developments resulting from the tight labour market environment, the substantial increases in the minimum wage and guaranteed wage minimum (doubling since 2010), the career path models and other sectoral wage reviews supported growth in wages. The Hungarian wage level is essentially in line with the productivity, although differences in the individual sectors do exist. As a result of reducing the labour taxes, the tax wedge declined, which contributed to the growth in households' disposable income and savings. In 2011 the personal income tax was changed to a flat rate (16 percent), and in 2016 it was reduced to 15 percent; in addition, in accordance with the wage agreement concluded at the end of 2016, the social contribution tax rate is continuously reduced. From 1 July 2020, the social contribution tax is reduced to 15.5 percent from 27 percent prevailing in 2016, and as a result of the further cuts in accordance with the agreement, the tax wedge may reach the current EU and regional average.

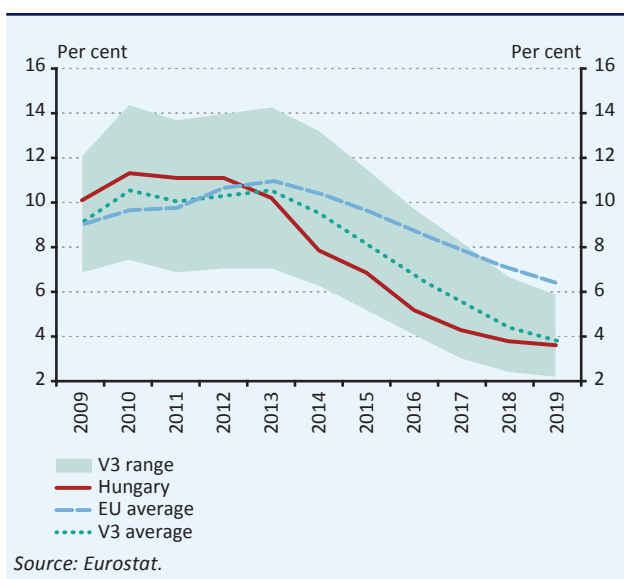
As a result of the favourable trends observed in recent years in the labour market, Hungary came close to full employment; however, substantial labour market reserves still can be identified. One of the most significant reserves is represented by the economically inactive groups being in more disadvantaged position in the labour market. Of them, Hungary's lag in activity compared to the EU and regional average is the greatest among persons being around the retirement age and those with low qualification. In addition, Hungary's activity rate is also lower among young people, while its lag is smaller in the group of women aged 25-49. In addition to the more vulnerable groups, major reserves can be identified also among Hungarian citizens living abroad. In 2019, the number of Hungarian citizens living abroad may have been around 630,000; however, in recent years, this may be deemed moderate as a percentage of the population, and in the past few years the immigration of Hungarian citizens to Hungary already exceeded the rate of emigration.

4.51 Employment rate in the 15–64 age group



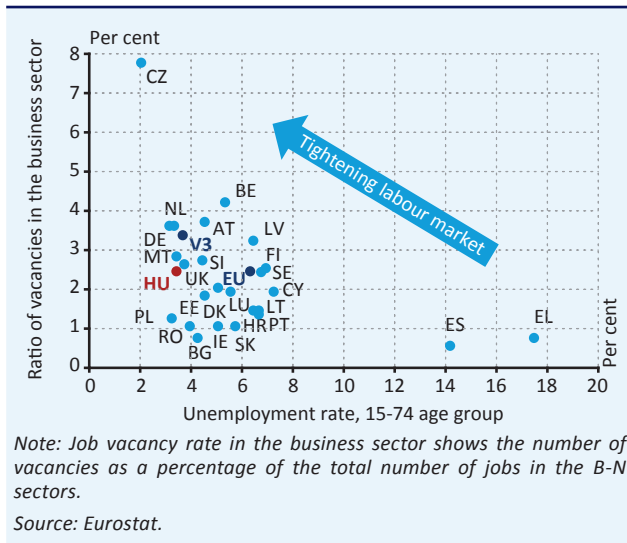
In recent years, the Hungarian employment rate registered one of the largest growths in the European Union. In 2010, the Hungarian indicator (54.9 percent) was the lowest in the EU, while by 2019 it rose to 70.1 percent, and reached both the regional and the EU average. The employment growth, which commenced in 2010, was substantially supported – in addition to the pick-up in economic activity – by the government’s measures fostering employment. The demand side was primarily stimulated by the introduction of the Job Protection Action Plan, while the labour supply was supported by the introduction of the flat-rate personal income tax and family support elements tied to employment relationship, the rationalisation of welfare transfers, the extension of public employment and the gradual raising of the retirement age.

4.52 Unemployment rate in the 15–64 age group



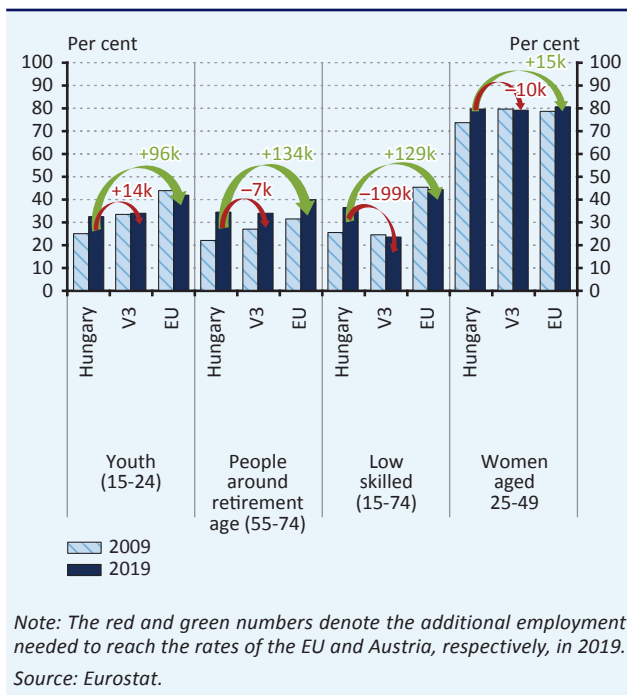
In parallel with the significant growth in employment, the unemployment rate materially declined in recent years. The unemployment rate, which soared as a result of the global crisis commencing in 2008, reached its historic high (11.3 percent) in 2010, and with that Hungary exceeded the average both of the EU and our regional competitors. Substantial decline in the unemployment rate started in 2013, with major contribution by the government’s measures fostering employment growth. In 2019, the Hungarian rate was 3.5 percent, lower than the average of the EU and our Visegrád competitors.

4.53 Labour market tightness in the EU in 2019



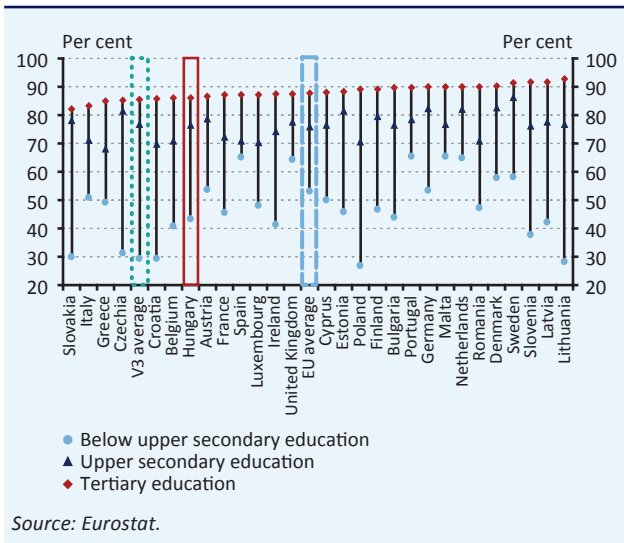
Labour market tightness eased in Hungary in the past quarters, but it is still stronger than the average of the European Union. At present, the unemployment rate is at a historically low level. In parallel with this, although the number of vacancies somewhat declined in the past one year, it is still at a high level. The fall in labour demand is also indicated by the fact that the significance of labour force, as a factor hindering production, decreased for the enterprises. The Hungarian labour market is tighter than the Polish and the Slovak one, but less tight than the Czech market.

4.54 Activity rate in certain social groups



The Hungarian activity rate registered one of the largest growths in the European Union since 2010; however, its level still moderately falls short of the EU average. The lower activity can be primarily observed at the more disadvantaged groups in terms of the labour market. Although the activity of these groups was increased by the benefits offered by the Job Protection Action Plan and the public employment, there are still substantial reserves in this group. Compared to the EU, Hungary has the greatest lag in the groups being close to the retirement age and of low qualification. In addition, Hungary's activity rate is also substantially lower among young people, while its lag is smaller in the group of women aged 25-49. In 2019, Hungary's activity rate in the groups of low qualification, women and persons being close to the retirement age was more favourable than the average of the Visegrád countries.

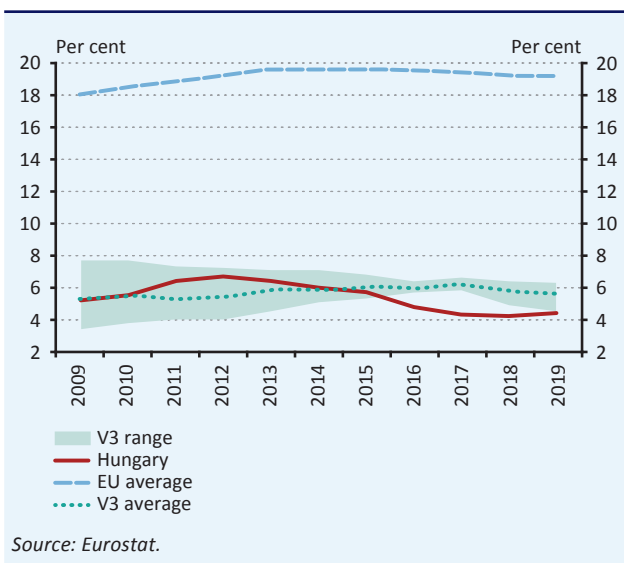
4.55 Activity rate by educational attainment level in the 15–64 age group in 2019



Source: Eurostat.

When examining it by educational attainment level, the activity rate rose at all levels in Hungary in the past years. Since 2010, the ratio rose by the largest degree among those with low qualification (by roughly 10 percentage points); however, the greatest lag compared to the EU average can still be identified in this category. The improving labour market position of the low-qualified observed in recent years was substantially contributed to by the introduction of the Job Protection Action Plan and public employment. The activity rate of those with secondary education is almost the same as the EU average, while that of the tertiary education graduates slightly lags behind that. In the Visegrád countries the activity of the low-qualified materially lags behind that of Hungary, while there is no major difference in the other categories.

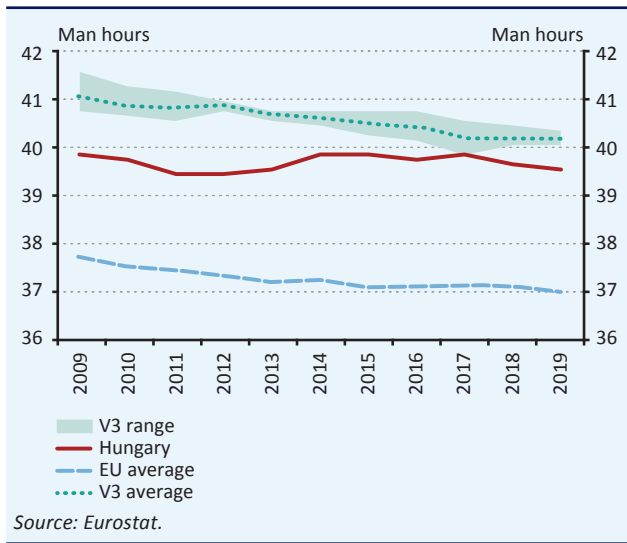
4.56 Part-time employees as a proportion of total employment in the 15–64 age group



Source: Eurostat.

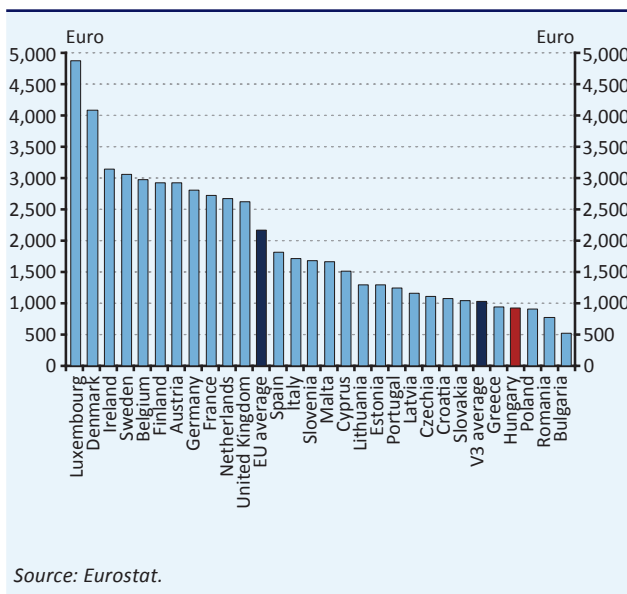
Part-time employment in the Visegrád countries is among the lowest ones in a European Union comparison. While in the EU the ratio of part-timers is almost 20 percent on average, it is roughly 6 percent on the V3 average and 4 percent in Hungary. As a result of the crisis, in Hungary the ratio of part-timers slightly increased due to the temporary shortening of the working time, which is primarily attributable to cyclical effects (labour hoarding in manufacturing); however, since then the ratio fell to its level before the 2008 crisis. As regards the part-time employment of women (7 percent), Hungary’s lag is even larger compared to the EU average (31 percent).

4.57 Average weekly number of hours worked



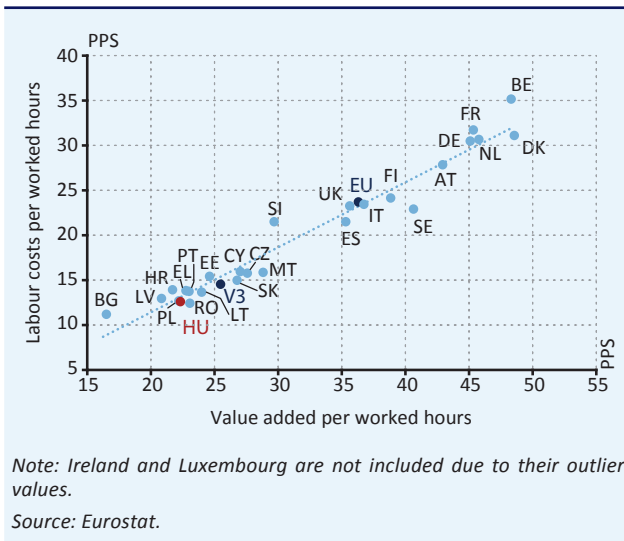
The average hours worked in the Visegrád countries is traditionally one of the highest in the European Union. The indicator of the region is around 40 hours, which exceeds the EU average, which is greatly attributable to the low penetration of part-time work in the Visegrád countries. Compared to the Netherlands, the country with the highest part-time employment, the employees of the region work on average by 10 hours more weekly. In the past decade, a decline in the total hours worked can be observed throughout the EU. However, in Hungary following the decline after the crisis the ratio returned to its previous level due to the tightening labour market and remained stable in recent years.

4.58 Monthly gross average wage in the EU in 2019



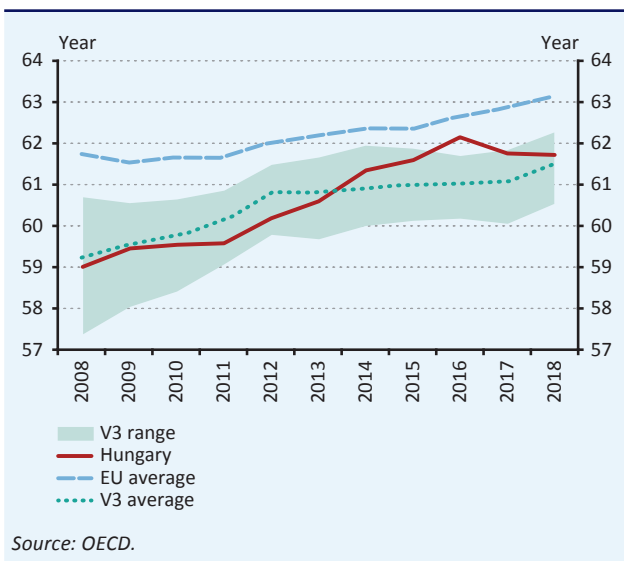
In the past years, Hungarian gross average wages registered one of the largest growths in an EU comparison. Between 2010 and 2019, gross wages and salaries (calculated based on the national accounts) rose by 48 percent, which is the seventh largest growth in the EU. In the tight labour market environment, the strong underlying wage developments, the doubling of the minimum wage and the guaranteed wage minimum since 2010, the career path models and other sectoral wage reviews significantly contributed to the rise in average wages. Nevertheless, expressed in euro terms, the Hungarian average wage still fails to reach half of the EU average wage, and slightly falls short even of the average of our Visegrád competitors.

4.59 Labour productivity and labour costs in the EU in 2018



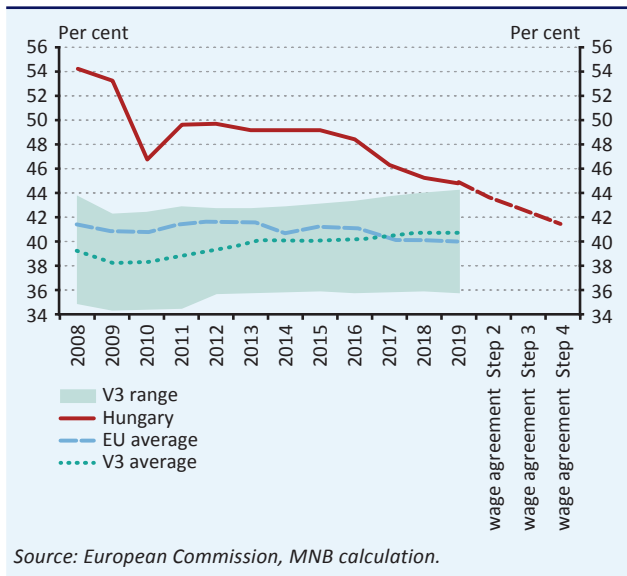
Despite the average wages lag behind the average of the European Union, the Hungarian wage level is in line with productivity. Hungary is in the last quarter of the EU ranking in terms of the wage cost per hour worked and the value added. In parallel with the major wage differences, Hungary’s productivity is roughly 60 percent of the EU average measured at purchasing power parity. Among the Visegrád countries, wages and productivity are similar in Poland, while the Slovak and Czech indicators exceed the Hungarian values. In terms of competitiveness and sustainable convergence, it is important that wage convergence should take place in the long run in parallel with the productivity growth providing cover for it.

4.60 Average effective age of retirement



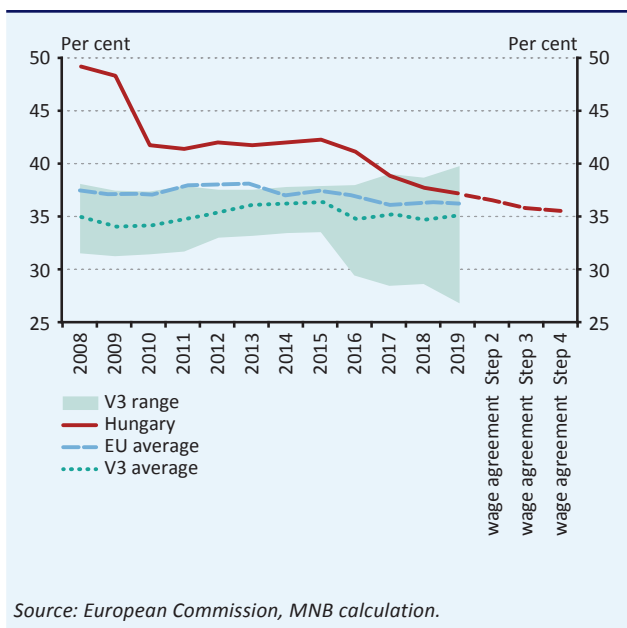
The effective age of retirement may differ from the official retirement age due to allowances and individual decisions. In the past two decades, in Hungary the effective age of retirement increased on the whole, with major contribution by the government measures. The cancellation of the early retirement options, the tightening of the disability pensions and gradual increase of the retirement age to 65 years until 2020, raised the effective age of retirement, as a result of which Hungary came close to the EU average. However, recently the rise in the effective age of retirement stopped, which is partly due to the possibility of old-age pension for women with an eligibility period of at least 40 years.

4.61 Average tax wedge of employees with no child, earning average wage



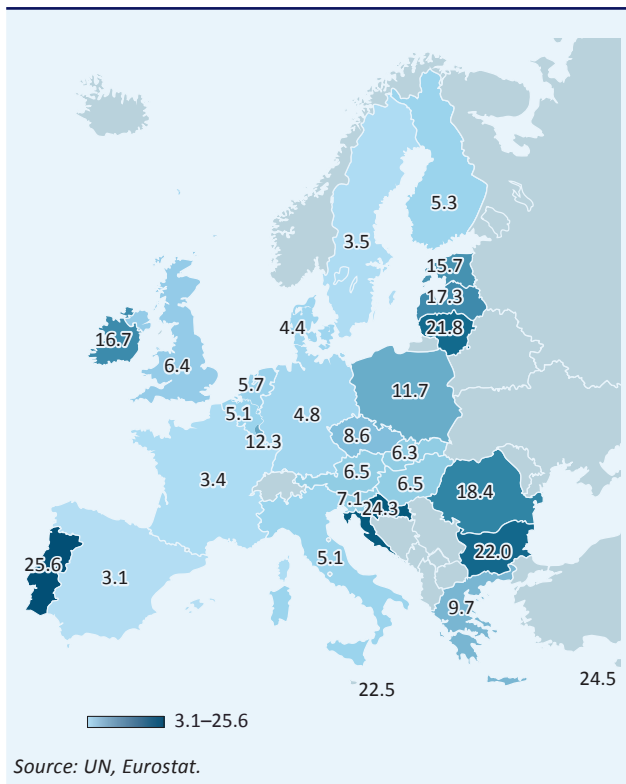
Within the framework of the transformation of the tax structure after 2010, the focus of tax centralisation moved from labour taxes to consumption taxes, as a result of which the average tax wedge decreased. In 2011, the personal income tax system was changed to a flat rate system (16 percent), and in 2016 the rate was reduced to 15 percent; after this, from 2017, the gradual reduction of the social contribution tax commenced. As a result of this, the average tax wedge of employees with no child, earning average wage decreases, but it is still higher (44.6 percent) than the average of the EU and the region. In accordance with the 2016 wage agreement, the social contribution tax may decrease from 27 percent to 11.5 percent in the coming years, depending on the wage increase. As a result of this – ceteris paribus – the average tax wedge may decrease to 41 percent, coming closer to the present EU and regional average.

4.62 Average tax wedge of families with two children and average wage



As a result of the tax allowances, the tax wedge of families is lower than that of single persons. At present, the average tax wedge of families with two children and average wage is 37.1 percent, which is lower than that of persons with no child by more than 7 percentage points. The decrease in the family tax wedge was contributed to by the family tax base allowance introduced in 2011, and then the doubling of the allowance for families with children in four steps between 2016 and 2019. The ratio at present is around the EU average and slightly above the average of our Visegrád competitors. In parallel with the further cut in the social contribution tax, the tax wedge of families may fall below 36 percent, coming close to the regional average.

4.63 Ratio of the population living abroad within the total population of the EU countries in 2019



Similarly to the regional trends, the number of citizens born in Hungary but emigrated abroad in the past twenty years rose in Hungary as well. The process accelerated in the second half of the 2000s, mostly due to the global financial and economic crisis of 2008 and the opening of the Western European labour markets. According to the UN's data, the number of Hungarian citizens living habitually abroad was roughly 630,000 in 2019. However, Hungary is regarded as a moderate emigrant country compared to both the core countries and the countries of the regions: the ratio of Hungarian population living abroad (6.5 percent), at present is the second lowest in the Central and Eastern European region and materially lags behind the EU average (11.6 percent). Slovakia's ratio is slightly lower than the Hungarian one, while the Czech and Polish figures substantially exceed it.

4.6 REGIONAL AND SOCIAL CONVERGENCE

Economic and regional inequality may influence the sustainability of economic growth. Inequality may be regarded as a natural concomitant of market economy and competition; however, the excessive degree thereof may destroy social cohesion and increase distrust, thereby jeopardising the sustainability and inclusive nature of economic growth and convergence. By contrast, inequality kept at a moderate level is less likely to give rise to social conflicts, it fosters equal opportunity, social mobility and the increasing of labour productivity, being fundamental pillars of economic and social development effective in the long run and of successful convergence.

In Hungary, despite the favourable trends in the past years, there are still significant regional disparities. As in the Central and Eastern European region, the dominance of the capital can be observed in Hungary as well, while the development level of the individual regions is fundamentally influenced by their location within the country. In addition, in Hungary differences in the development of the eastern and western regions can be also observed. The political transition substantially contributed to the present regional disparities, since it was then when the difference between the dynamically developing centres and the peripheries developing more slowly strengthened (Káposzta, 2014)². Although in recent years, as a result of the government measures and the regional development programmes, the differences between the counties declined in several economic indicators, they are still significant.

The development level of the capital considerably exceeds the level of the counties; in addition, as the only NUTS 3 region in Hungary, the development of Budapest exceeds even the EU average. The GDP per capita in Budapest was twice as high as the national average in 2018 while that of the least developed Nógrád County was merely 44 percent. The development level of most counties is around 60 and 80 percent of the national average. The difference in the development level of counties was the largest in 2009, which has been continuously decreasing since then, as the economic superiority of Budapest declined and the lag of several regions – primarily those involved in vehicle manufacturing – decreased (HCSO 2019)³. There is also significant concentration in terms of the production of GDP: 37 and 10 percent of the gross domestic product related to Budapest and Pest County, respectively, in 2018. Apart from those, only Győr-Moson-Sopron County had a share higher than 5 percent, while the smallest contribution was made by Nógrád County at 1 percent.

The larger inflows of foreign direct investment, the presence of advanced business services and manufacturing significantly contribute to the growth in the counties' level of development. Major differences can be observed both in investment and industrial production. In 2019, the value of investments per capita was the highest in Budapest – 2.6 times higher than the national average – while it was the lowest in Nógrád County. The most important regions of industrial production traditionally include the counties of Central and Western Transdanubia and certain districts of Budapest, but in recent years the significance of certain districts of Northern Hungary also increased.

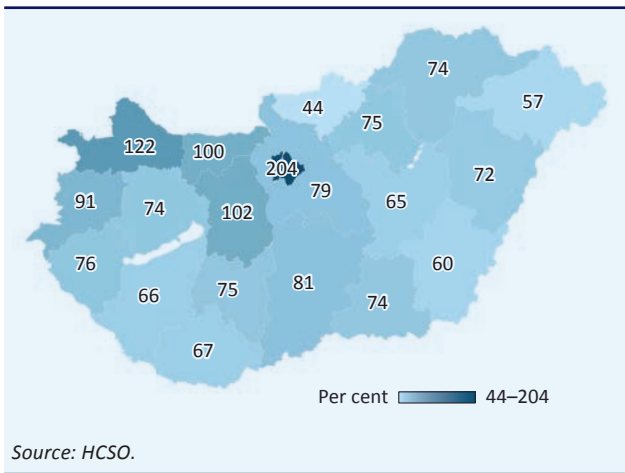
As a result of the favourable trends of recent years, the territorial differences of the labour market decreased, but inequalities can still be identified. In the past decade employment rate rose in all counties and in parallel with this unemployment decreased. The degree of the change was larger in the less developed regions, and thus the inequality declined in this area. However, it is still the Western and Central Transdanubia, and Central Hungary regions that have the most favourable labour market indices. Despite the almost full employment, there are still labour market reserves, but the regional distribution of those is uneven. In the more developed regions the labour reserves practically ran out due to the strong labour demand, while the less developed counties are characterised by relatively large labour supply and low labour demand.

As regards the income and wealth inequalities, Hungary traditionally belongs to the countries of lower inequality both in a global and EU comparison. In recent years, the Gini index based on income was stable, and although it exceeds the average of the V3 countries, it falls short of the EU average. The value of the Gini coefficient based on wealth, also being lower than the EU average, is substantially influenced by real estate ownership, since in Hungary home ownership traditionally prevails. Since 2010, the AROPE index, measuring the ratio of the population exposed to the risk of poverty or social exclusion, fell from roughly 30 percent to 19 percent, and now it does not exceed the EU average.

² Source: Káposzta, J. (2014): Területi különbségek kialakulásának főbb összefüggései (Key correlations of the development of regional differences)

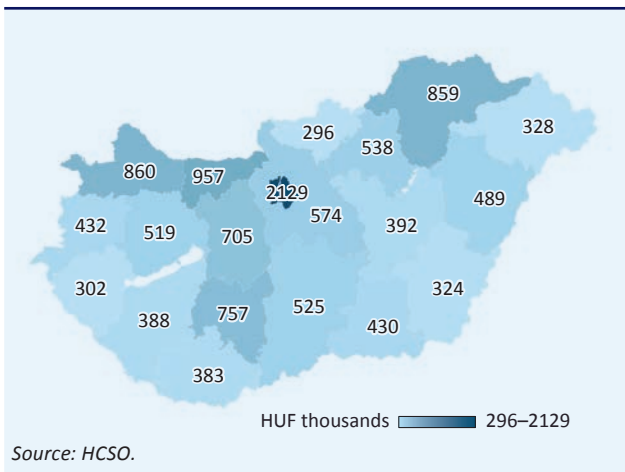
³ Source: HCSO (2019): Tér-kép, 2018

4.64 GDP per capita as a percentage of the average in 2018



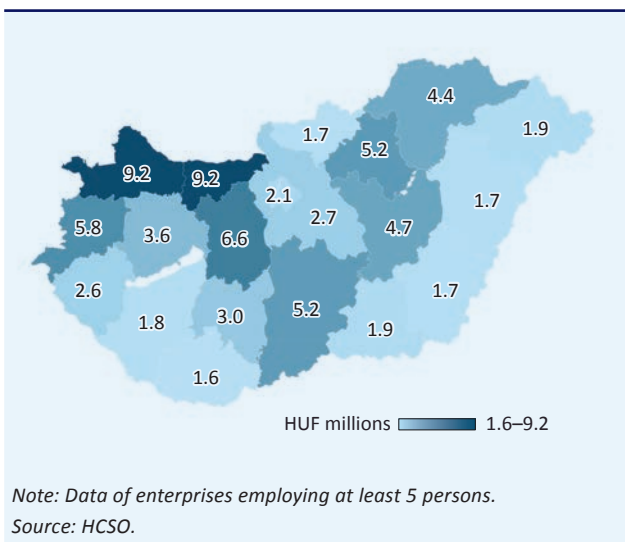
In Hungary there are major regional differences as regards the economic development of the counties. When examining the ratio of GDP per capita compared to the national average, major difference can be identified between the development level of the capital and the countryside as well as between the western and eastern parts of the country. The development of Budapest was twice as high as the national average in 2018 while that of the least developed Nógrád County was merely 44 percent. The index of Győr-Moson-Sopron, Fejér and Komárom-Esztergom counties exceeds or is around the national average, while the development level of most counties is between 60 and 80 percent. Between 2008 and 2018 the GDP per capita rose to the largest degree in Borsod-Abaúj-Zemplén and Bács-Kiskun counties, by roughly 90 percent, while the smallest growth was registered in Pest county at 45 percent.

4.65 Investment activity per inhabitant by counties in 2019



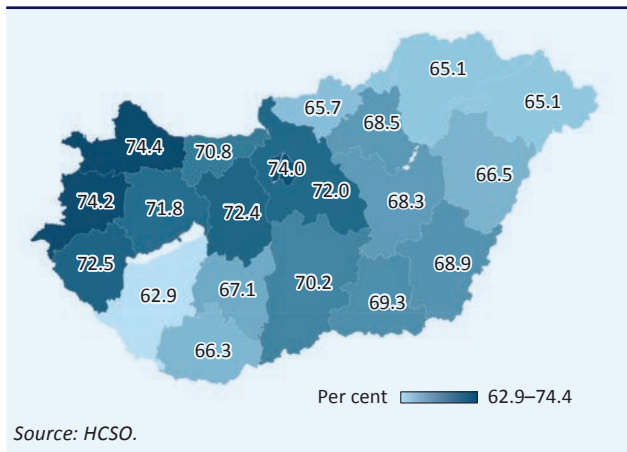
In parallel with the vigorous growth in investments from 2017, in the past period significant investment growth was observed in most of the counties. In 2019, the value of investment per capita was the highest in Budapest (HUF 2.1 million), which exceeds the national average 2.6 times. The lowest investment activity was registered in Nógrád County (HUF 296,000). Based on the registered offices of enterprises, major concentration can be observed in terms of the regional breakdown of investments; 55 percent of the investments were implemented in Budapest (46 percent) and in Pest County (9 percent), 23 percent in the Great Plain and in Northern Hungary, while 22 percent in the Transdanubia in 2019. In 2019, the volume of investments rose to the largest degree in Tolna and Borsod-Abaúj-Zemplén counties (by almost 60 percent). In the majority of the counties the highest investment activity was realised in the industrial sector.

4.66 Industrial production per inhabitant by counties in 2019



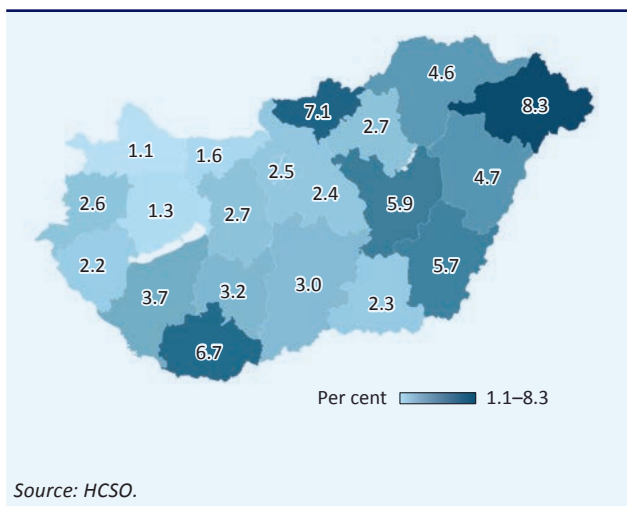
On the average of the past years, the volume of industrial production grew in the majority of the counties, in parallel with which the production per capita also increased. In 2019, the industrial production per capita was the highest, amounting to HUF 9.2 million, in Győr-Moson-Sopron and Komárom-Esztergom counties – exceeding the national average (HUF 3.5 million) by 2.6 times – while it was the lowest in Baranya County at HUF 1.6 million. In 2019, the largest growth in industrial production was registered in Győr-Moson-Sopron County (11 percent), while it declined to the greatest degree in Nógrád County (-6 percent). Based on the industrial production data at the level of districts, the most industrialised regions of Hungary include Northern and Central Transdanubia, in the middle section of the Danube the region of Dunaújváros and Paks, certain districts of Budapest, the districts of Northern Hungary with industrial traditions, and the districts located alongside the M5 motorway.

4.67 Employment rate by counties in the 15-64 age group in 2019



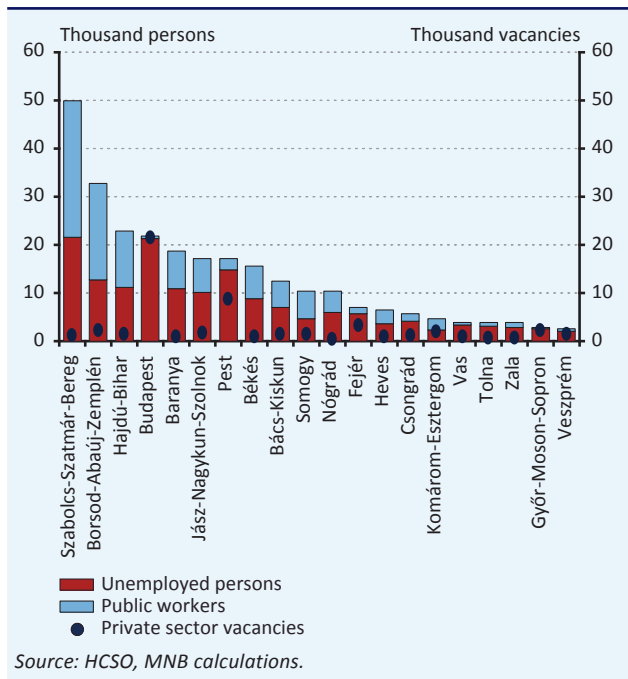
Despite the favourable labour market trends of recent years, regional differences still exist in terms of the volume of employment. In 2019 the employment rate was the highest in Győr-Moson-Sopron County, over 74 percent, and the lowest in Somogy County, 63 percent. In the past decade employment rate rose in all counties. The largest growth was registered in the counties of Northern Hungary and the Great Plain, which contributed to the decrease in regional differences. The largest growth – 20 percentage points – was registered in Szabolcs-Szatmár-Bereg County, with the lowest employment rate (45.1 percent) in 2009, thereby coming substantially closer to the national average. Since 2009 the smallest growth in employment rate was registered in Budapest and Komárom-Esztergom County; however, their indicators still exceed the national average.

4.68 Unemployment rate by counties in the 15-64 age group in 2019



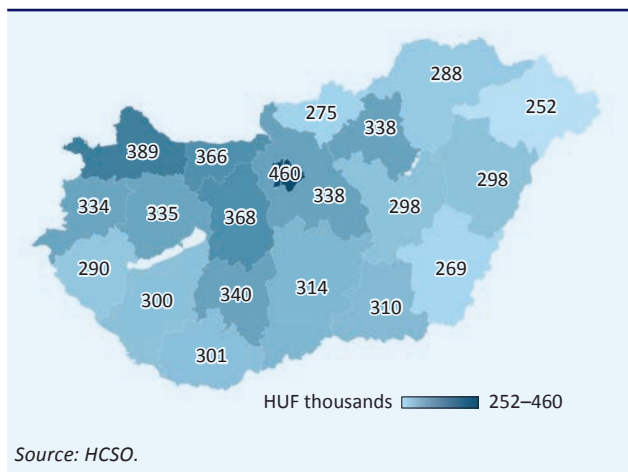
In parallel with the rise in employment, the unemployment rate decreased in recent years in all counties, and in most of the counties it fell to the lowest level of the past almost three decades. Despite the favourable national trends, there are still remarkable differences between the individual regions of the country. In 2019, the unemployment rate was the lowest in Győr-Moson-Sopron County at 1.1 percent, and the highest in Szabolcs-Szatmár-Bereg County at 8.3 percent. Since 2009, the largest decline was registered by the counties of Northeast Hungary, but the rate is still the highest here. Following the crisis, the ratio of Western and Central Transdanubian regions, being in a more favourable position, decreased to the smallest degree, but in these counties unemployment is still significantly lower than the national average.

4.69 Vacancies in the private sector and labour reserve (unemployed persons and public employees) by counties in 2019



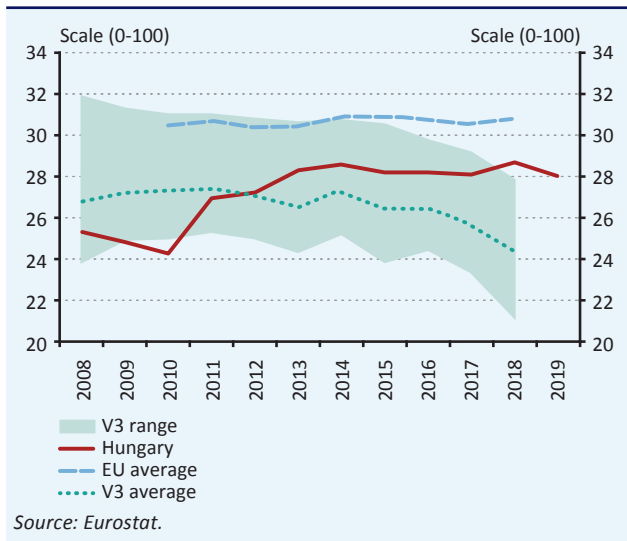
Despite the almost full employment, there are still labour market reserves, but the regional distribution of those is uneven. The most easily accessible labour market reserves are the unemployed persons and those in public employment. The number of public workers, similarly to the unemployed, is the highest in the northeast regions of the country. It can be observed that in the more developed regions (Western Transdanubia and Central Hungary), the labour reserves practically ran out due to the strong labour demand, while the less developed counties are characterised by relatively large labour supply and low labour demand (vacancies). Budapest substantially differs from the national average, since at present vacancies slightly exceed the number of the unemployed only in the capital.

4.70 Monthly gross average wage by counties in 2019



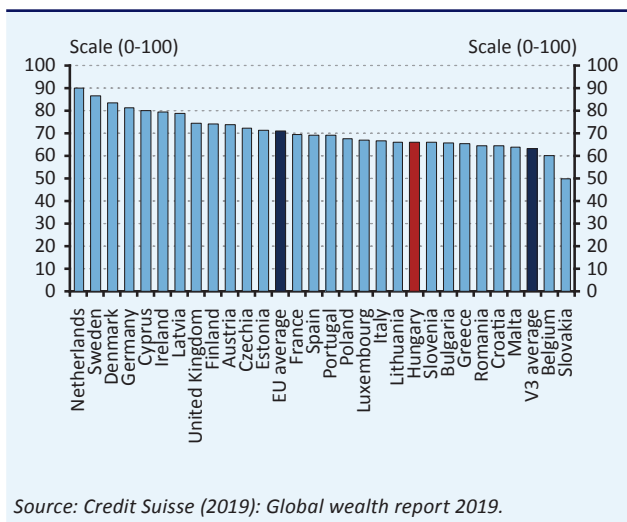
As a result of the favourable economic performance of the past years, the strong underlying wage developments caused by the tight labour market and due to the increases of the minimum wage, average wages considerably rose in all counties. In the counties of Central and Western Transdanubia the average wage almost doubled since 2009, but even in Szabolcs-Szatmár-Bereg County, registering the smallest growth, the rate of the wage increase was close to 70 percent. At present the gross average wage is the highest in Budapest, at HUF 460,000, and the indicator of Győr-Moson-Sopron County also exceeds the national average (roughly HUF 370,000). There are still major wage differences: the average wage in the capital exceeds that in Szabolcs-Szatmár-Bereg County 1.8 times, which is significantly influenced by the differences in the structure of employment.

4.71 Income-based Gini index



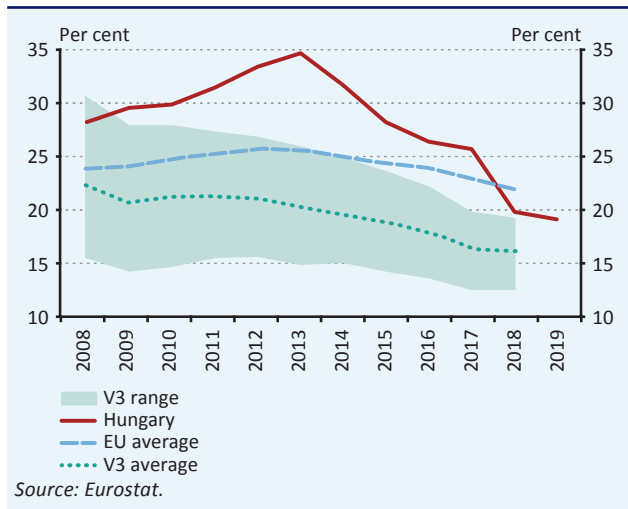
In recent years, the Gini index, one of the most commonly used indicator of economic inequalities within the society, stood at a moderate level in an EU comparison in the past years in Hungary. The growth in the Hungarian indicator between 2010 and 2014 may have been attributable to the gradual rise in the capital income of those with higher income after the global crisis and the permanent deterioration in the position of those with low income, more exposed to the crisis. In parallel with the stabilisation of the disposable income and the soar in employment, the rise in the income inequality index stopped, and it develops between the EU and regional level.

4.72 Wealth-based Gini index in 2019



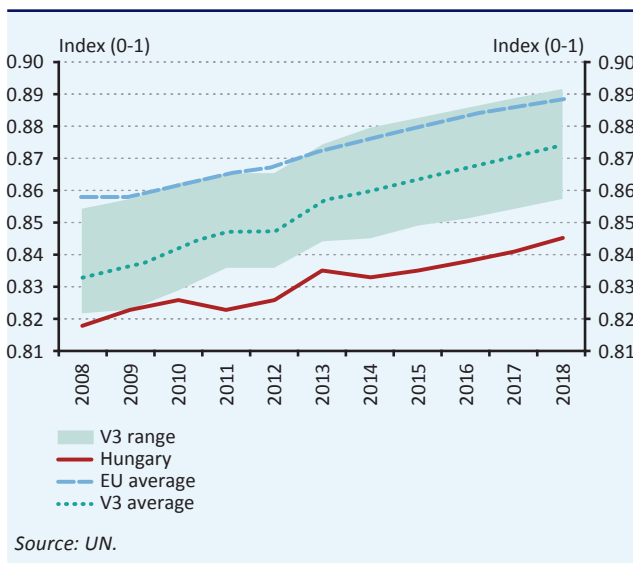
The wealth-based inequality is more favourable in Hungary than the average of the European Union. The slightly lower average value registered by our Visegrád competitors is attributable to Slovakia's index significantly falling short of the EU average, since the index of both Poland and Czechia is higher. Real estate ownership fundamentally influences the value of the wealth Gini. Hungary is traditionally dominated by home-ownership; roughly 86 percent of the households own their home, which is one of the highest ratio in the European Union.

4.73 Ratio of people at risk of poverty or social exclusion (AROPE)



In the past decade, Hungary registered one of the largest declines, in an EU comparison, in the AROPE index, measuring the ratio of the population exposed to the risk of poverty or social exclusion. At present, the indicator is at its historic low – 18.9 percent – which is better than the average of the European Union, but slightly exceeds the average of the Visegrád countries. Of the three sub-indicators of AROPE, it is the relative income poverty that affects the largest number of people in Hungary (12.4 percent). The ratio of those affected by severe material deprivation is 8.7 percent, while of those living in households with very low work intensity is 3.7 percent. All three – overlapping – dimensions considerably declined in recent years, with significant contribution by the tax, income, employment and family policy measures after 2010.

4.74 Human Development Index (HDI)



The Human Development Index compares life quality in the countries of the world on the basis of life expectancy, education and living standard. Similarly to the EU and regional trends, Hungary’s indicator also shows a continuous rise, but falls short of the average of both the EU and the Visegrád countries. Compared to our regional competitors, Hungary has the largest lag in GNI per capita, indicating the standard of living; in addition, we also lag behind the average of the V3 countries in the average and expected number of years in school and in the life expectancy. On the whole, the UN allocates Hungary to the category of countries with very high HDI.

4.7 FAMILY-FRIENDLY PROGRAMME

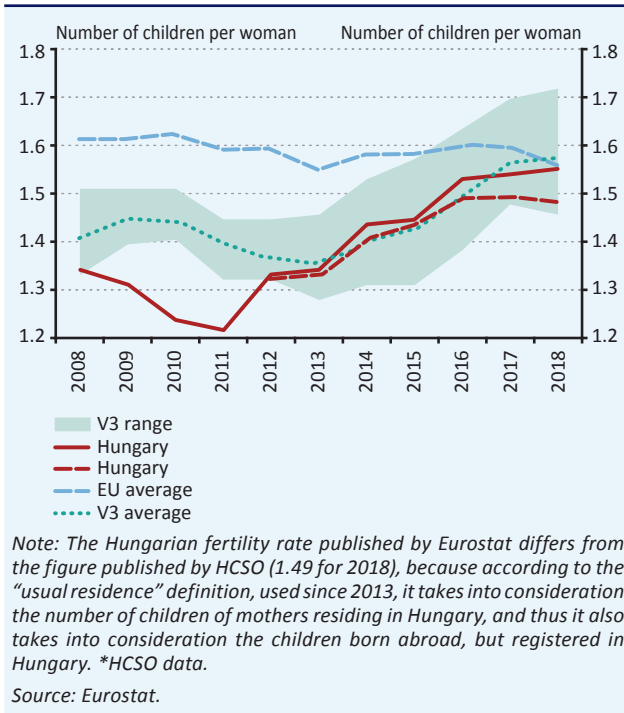
One of the key issues of long-term economic growth is the quality and quantity of the human capital that is active in the labour market. Over the long term, the quantitative factors of human capital are mostly determined by demographic developments, of which the decrease in and ageing of the population represent the greatest challenges for almost all developed countries, including Hungary. Based on the population projections, if the present demographic trends continue, in the next decades the Hungarian population will decline further and the number of the working age population may decrease by almost half million people by 2030 compared to 2020. However, successful economic convergence in the long run is unfeasible with decreasing population. The lower number of births compared to the previous decades also impacts the structure of the population as it results in younger generations of fewer people compared to the older generations. The fall in the number of the working age population entails a decline in labour supply, which – ceteris paribus – may also have negative effect on economic growth. With a view to reversing the unfavourable demographic trends, it is important to develop a social policy that can efficiently support the realisation of plans to have children.

Boosting the fertility rate is a precondition for reversing the unfavourable demographic trend. In order to ensure constant population size a fertility rate of around 2.1 should be achieved and maintained in the long run. At present the ratio does not reach the reproduction threshold value in any of the member state of the European Union, and the average of the EU countries even declined slightly in recent years. In the past period the trends in Hungary developed positively, since the fertility rate rose significantly from the historic low of 1.23 registered in 2011 to 1.5, coming close to the EU average. However, the fertility ratio still falls short of 2.1, i.e. the value necessary for the reproduction of the population. In recent years, the stagnation of the fertility rate was accompanied by a decline in the number of births, caused by the considerable decline in the number of women in childbearing-age.

Another determinant factor of the population size is life expectancy at birth, the rise of which also increases the volume of available human capital. In Hungary, life expectancy at birth rose by 2 years in the past ten years, which nevertheless significantly lags behind the EU average and also the values in the Visegrád countries.

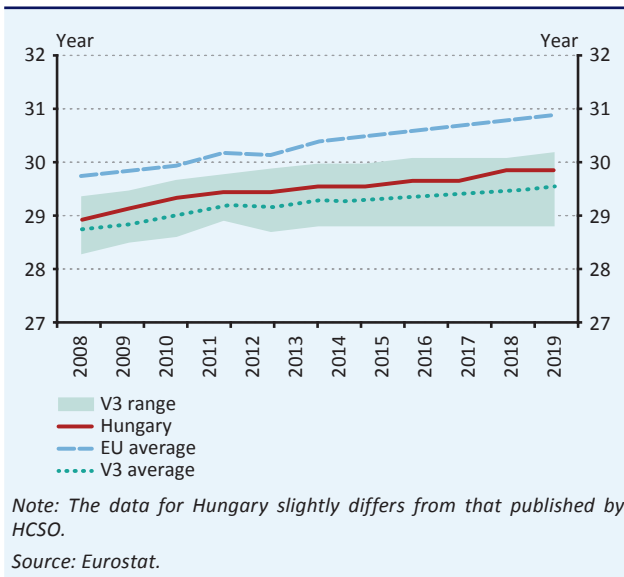
As regards the demographic trends, in addition to the decline in the size of the population, ageing also represents increasing challenge. The ageing of the population is caused by the low fertility rate and the gradually rising life expectancy. The ageing of the population can be captured by several indicators, one of which is the ratio of inhabitants older than 65 years within the population. The proportion of population aged 65 and over shows an increasing trend in the developed countries. In Hungary, the ratio was 19 percent in 2019, which was slightly lower than the EU average, but exceeded the average value of the Visegrád countries. The ageing of the population – ceteris paribus – increases the ratio of the inactive per active employee, which in the long run may have negative impact on the growth prospects.

4.75 Total fertility rate



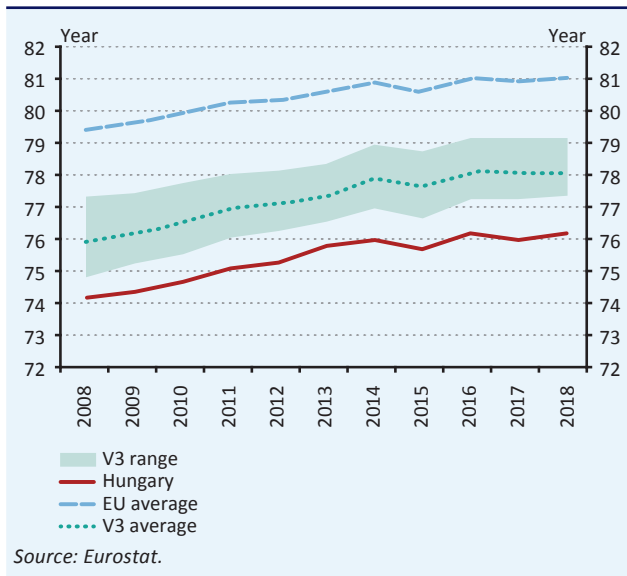
Total fertility rate is a hypothetical number of children calculated for women of childbearing-age (15-49 years) on the basis of the number of births in the given year. In order to ensure constant population size a fertility rate of around 2.1 should be achieved and maintained in the long run. The low number of live births is a major challenge in almost all developed countries. In the European Union at present none of the member states is able to reach the reproduction threshold value, and the average of the EU countries even declined slightly in recent years. In the past period the trends in Hungary developed positively, since the fertility rate rose significantly from the historic low of 1.23, registered in 2011, and it is around 1.5 since 2016. The major growth in Hungary, in an EU comparison, may have been partly attributable to the strengthening of the family support system after 2010, as well as to the general improvement of the economic environment.

4.76 Mean age of women at childbirth



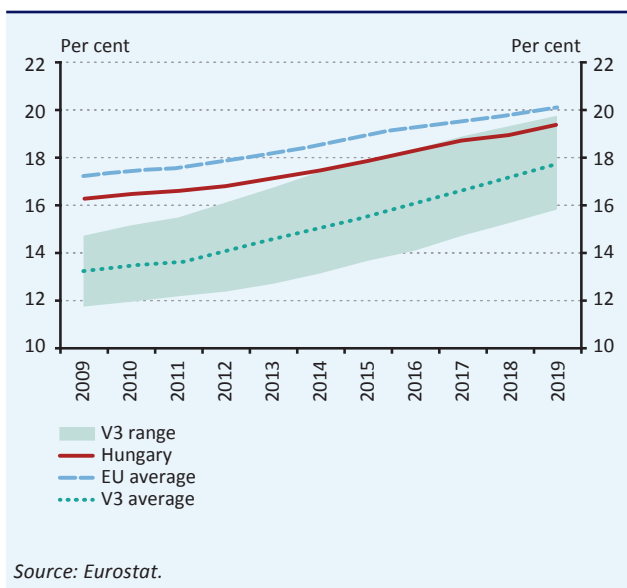
In the past decades the age at childbirth substantially increased. In 2018, the average age of mothers at childbirth was 29.8 years in Hungary, which is a rise of one year in the last 10 years. The Hungarian figure is lower than the EU average, and is in line with the average values of the V3 countries. The value of the fertility rate is reduced by the gradual increase in the age of birth-giving, i.e. the postponement of having children to older age. When the increase in the age of childbirth stops and the postponed plans to have children are realised, the value of the fertility rate rises compared to the previous period.

4.77 Life expectancy at birth



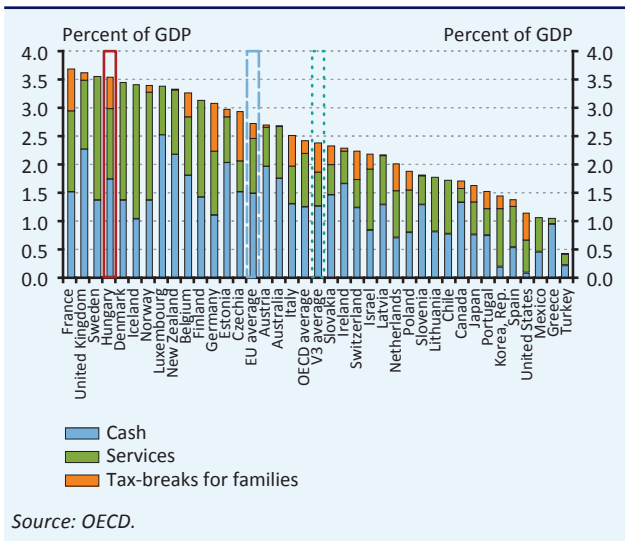
Life expectancy summarises the mortality statistics of the current population. Life expectancy at birth shows how many years an individual born in the reporting year can expect to live under the given year's mortality conditions. Life expectancy considerably increased in the past decades in the more advanced countries, including Hungary, with important contribution by the continuous improvement in health care and health awareness. In Hungary, life expectancy at birth was 76.2 years in 2018, which falls short of the average value applicable to the EU and V3 countries for decades.

4.78 Proportion of population aged 65 and over



One measure of the ageing of the population is the ratio of those older than 65 years within the population, which shows an increase in all countries under review. The rise in the older generation within the population is attributable to two factors: on the one hand, the lower number of births compared to the previous decades, and on the other hand the rise in life expectancy. In Hungary, the ageing of the society shows a similar trend to the EU average, although at a lower level. In the V3 countries, the proportion of population aged 65 and over is lower than the Hungarian and EU average, but in recent years its growth rate was faster than in the countries of the EU.

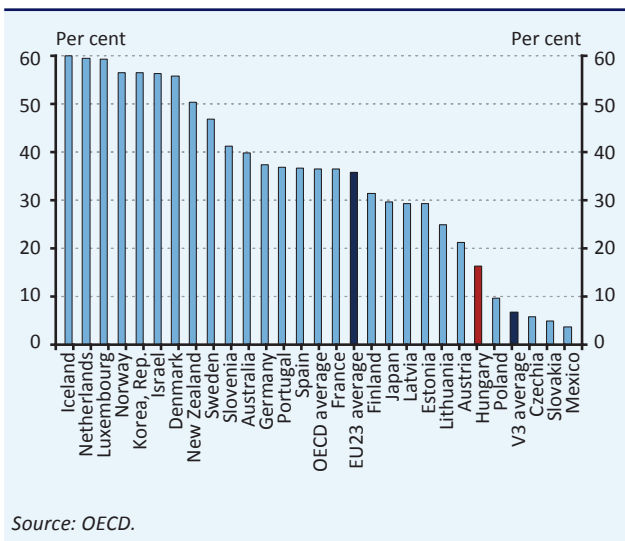
4.79 Public spending on family benefits as a percentage of GDP (2015)



Source: OECD.

In Hungary, the spending on family benefits is high in an international comparison. According to the last available international data, in 2015 the expenditures on family benefits amounted to 3.5 percent of GDP in Hungary, which was the fourth highest value among the OECD countries. Within the Hungarian family support expenditures, cash benefits amounted to 1.7 percent and benefits in kind (services) to 1.2 percent of GDP, while Hungarian families received support in the form of tax allowance in an amount corresponding to 0.6 percent of GDP. The Hungarian figure for 2015 materially exceeds the value of 2.4 percent of the OECD countries and 2.7 percent of the member states of the European Union. Since the last available data, Hungarian spending on family benefits may have increased further as a result of the expansion of the tax allowance of families with two children, the exemption of women with four children from personal income tax, the family housing allowance and the childbirth incentive loan.

4.80 Enrolment rate in early childhood education and care under the age of 3 years (2017)

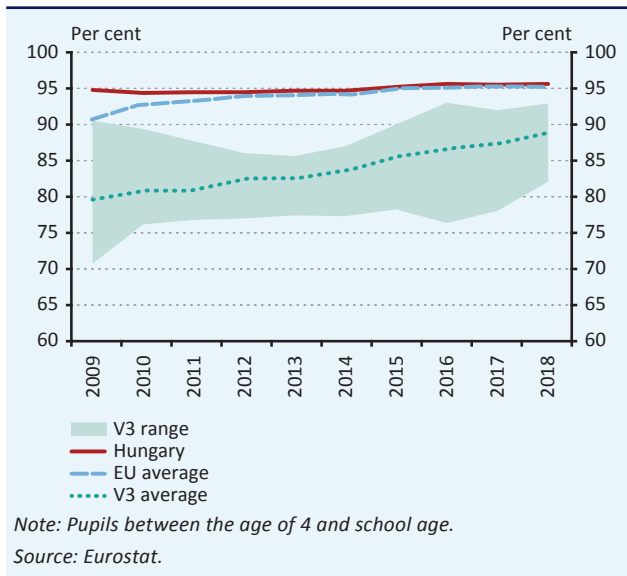


Source: OECD.

According to the international experiences, in those countries where the employment rate of women is higher, fertility rate is generally also higher. Namely, the realisation of plans to have children may be fostered if women of reproductive age can count on being able to return to labour market easily after childbirth, if they decide so. In Hungary, the ratio of children younger than 3 years participating in early childhood education rose from 10 percent registered in 2010 to 16 by 2017, which was facilitated by the major increase in the capacity of nurseries in recent years. Based on the HCSO data, the capacity of nurseries operating in Hungary rose from 32,516 registered in 2010 to 40,648 by 2018.⁴ However, in the EU countries the participation rate was 36 percent in 2017, and thus there is still room in Hungary for increasing capacity. Recognising the problem, within the framework of the Family Protection Action Plan, announced in February 2019, the government decided on the further increase of nursery capacities, and by 30 June 2022 the capacity of nurseries will rise to 70,000 children.

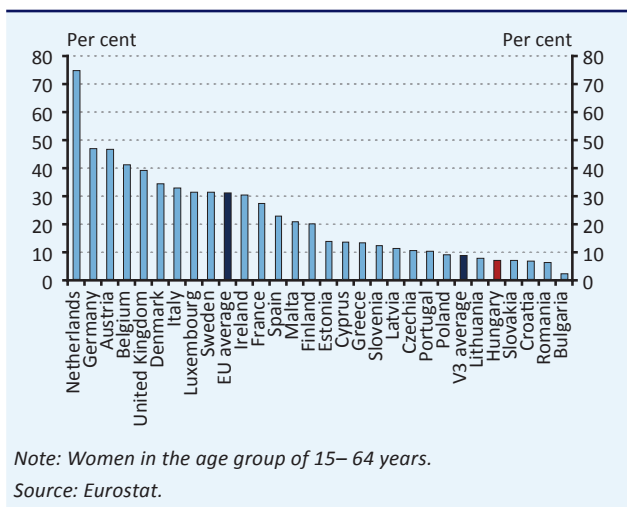
⁴ When also taking into consideration the family, mini and workplace nurseries, in 2018 the operating capacity of nurseries was 47,169 in Hungary.

4.81 Enrolment rate in early childhood education between the age of 4 and school age



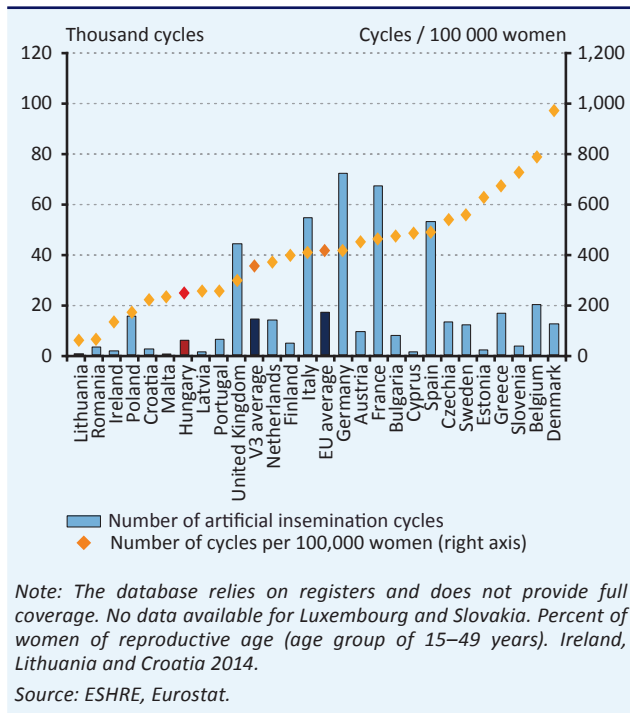
The ratio of children between the age of 4 and school age enrolled in early childhood education in Hungary corresponds to the average of the EU countries, and exceeds the ratio of each of the other three Visegrád countries. In Hungary 96 percent of the pupils between the age of 4 and school age participated in education corresponding to their age according to the International Standard Classification of Education (ISCED). Since 2015 it is mandatory in Hungary to enrol in the kindergarten from the age of 3, while exemption may be requested from this for children over the age of 5 for a variety of reasons (e.g. family circumstances, evolution of skills). The relevant regulation will be tightened from September 2020 (exemption may be applied for from the age of 4, but based on fewer reasons). The rise in ratio of children enrolled in early childhood education in the other Visegrád countries is clearly attributable to the results of Poland, which increased its ratio from 71 to 93 percent in 10 years.

4.82 Ratio of women in part time employment (2019Q3)



Return to the labour market after childbirth may be fostered by the penetration of atypical forms of employment. These include, for example, part-time employment and teleworking, which facilitate the harmonisation of the home and work duties. Based on the survey performed by the Hungarian Central Statistical Office in 2015, 41 percent of the respondent mothers with small children regarded the work regime provided by the employer taking into consideration the individual life situation as the greatest help in terms of returning to the labour market. In the third quarter of 2019, the ratio of women employed as part-timers was merely 6.8 percent in Hungary among women aged 15–64. This value is significantly lower than the average of 31 percent, applicable to the EU countries, and it is also lower than the ratio of 8.7, registered in the V3 countries.

4.83 Number of artificial insemination cycles (2015)



Based on the data of the European Society of Human Reproduction (ESHRE) – built on registers, and thus unfortunately do not provide full coverage – artificial insemination in Hungary is less common than in most countries of the EU and the region. In Hungary, the ratio of artificial insemination cycles per 100,000 women in reproductive age (age group of 15-49 years) was 246, which falls short of the EU average by more than 40 percent. The results are nuanced by the fact that at present we have no precise data as to the number of children born in Hungary through artificial insemination. Most of the reasons for this (e.g. the databases cannot be connected, non-comprehensive data collection) are expected to cease following the acquisition of the institutions engaged in artificial insemination by the government in 2020. The report on human reproduction procedures, covering only Hungary⁵, reports higher number of interventions than the international association (7,000 interventions instead of 5,600), but even this value substantially lags behind the international averages. It should be also noted that in Hungary one quarter of the interventions were performed on women older than 40 years. This suggests that the Hungarian couples tend to insist on parenting intentions even when their chances for successful treatment are significantly reduced.

⁵ OBDK (2015): Annual report on human reproduction procedure 2014

4.8 HEALTHY SOCIETY

Health is part of national wealth forming the basis of the countries' most important resource, i.e. the human capital. The health status of the population is not only personal and family matter, but also one of the particularly important national economy issues, since the health status influences – through the quality and quantity of the available labour force – the country's economic efficiency and competitiveness. Chronic illnesses reduce both the active time spent in work and the productivity of labour force, while premature mortality also causes major damage to the national economy. For this very reason, protection of existing health is advantageous for the society from individual and economical perspective as well.

The health status of the Hungarian population lags behind that observed in the countries of similar development level in the region, which – in addition to the gradual ageing of the society – lays increasing burden on the health care system, already struggling with numerous challenges. From the perspective of health care, the prevention of illnesses is the simplest and most economical way to ensure the adequate health status of the population. However, the pursuit of a healthy lifestyle is not yet sufficiently present in the Hungarian population, which is also evidenced by the morbidity and mortality rates. The ratio of the obese adult population (26 percent) is the third highest in Hungary among the EU countries. Partly due to this, in Hungary quite a lot of people suffer from illnesses that could be prevented by healthier lifestyle (e.g. high blood pressure and diabetes). The mental health of the population could be also improved; the reduction of those experiencing depressive symptoms could contribute to the improvement in the employees' productivity. At the same time, it should be noted that the vaccination system for the prevention of infectious diseases is of outstanding quality in Hungary even by international standards; therefore these diseases do not pose problems in Hungary.

In 2018 in Hungary the healthy life expectancy slightly exceeded the average of the V3 countries, while it fell short of the EU average. Hungarian women and men live 61.8 and 60.4 years, in health, while the average value of the population of the European Union is higher by 2.9 years (women: 64.2; men: 63.7). More than half of Hungarian mortality is attributable to some sort of behaviour risk, while the effect of improper nutrition is particularly high even in an international comparison. The number of deaths that can be prevented by proper preventive programmes and avoided by proper treatment was the fourth highest in Hungary among the EU countries. The standardised death rate of malignant neoplasms is the highest in Hungary within the EU countries, both in the whole population and in the working age population. The unfavourable Hungarian mortality statistics is also attributable to the fact that a large part of the diseases diagnosed only in a late stage, which increases the costs of treatments and reduces the efficiency of those.

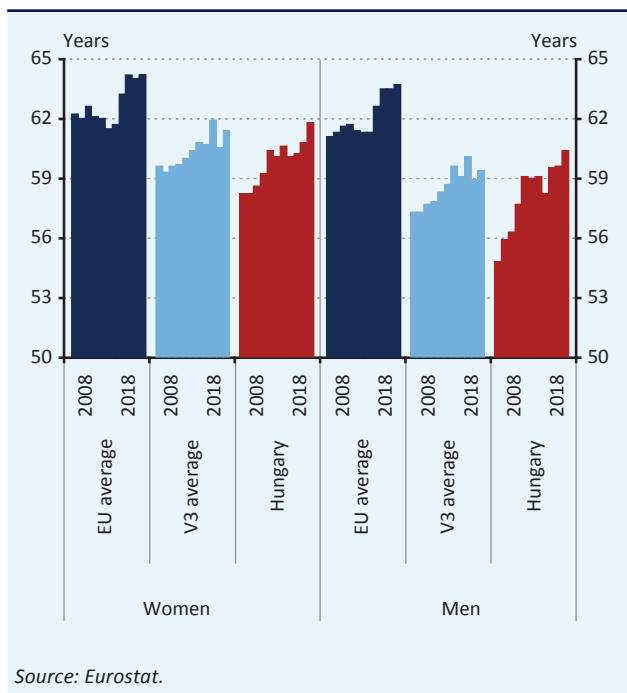
Hungary's health care expenditure as a percentage of GDP (6.9 percent) slightly exceeds the average of the other Visegrád (6.8 percent), but it fell short of the average of the EU Members States (8.3 percent) in 2017. The average level of the health care expenditures as a percentage of GDP has not changed significantly since 2010 in the European Union and in the region, while Hungary registered a moderately decreasing trend. In Hungary, 69 percent of the health care expenditure come from public sources, which falls short of average of the European Union and the Visegrád countries by 4 and 8 percentage points.

One of the problems of the Hungarian health care system is that the private health care expenses are spent not through health funds or supplementary private health insurances. Households' out-of-pocket health care expenditures amount to 1.9 percent of GDP, which exceeds both the regional (1.3 percent) and the EU average (1.8 percent). This represents a problem primarily because, partly also due to this, 11.6 percent of Hungarian households incurred catastrophic health expenses (i.e. households' direct, out-of-pocket health care expenditures amounted to at least 40 percent of their expenses over their living expenses, i.e. food, housing and public utility), which is more than twice as high as the EU (5.7 percent) and the V3 average (5.2 percent), and the third highest one among the EU countries assessed to date.

The supply of human resources also represents a challenge; particularly due to the low number of ancillary workers compared to the doctors, and to the high ratio of doctors and ancillary workers being close to the pensionable age. While in Hungary the number of doctors with license to practice as a percentage of the population roughly corresponds to the international average, the ratio of the ancillary workers is considerably lower than the EU average. The ageing of doctors causes challenges in medical care not only in Hungary, but also throughout Europe, which contributes to the migration of doctors to the Western and Northern European countries with more ample financial resources. Moreover, Hungary’s situation is complicated by the fact that 19 percent of the doctors holding a licence to practise are over 65 years of age, which is the second highest value among the EU countries.

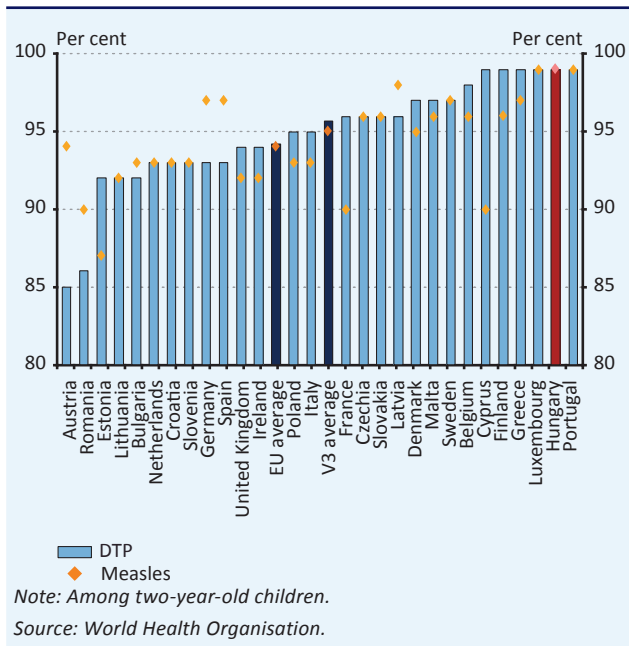
At the same time, the Hungarian health care system has a large volume of efficiency reserves, exploiting which could improve the sustainability of the system even without increasing the expenditure level. In Hungary, the bed occupancy rate was 66 percent in 2017, which – mostly due to the limits of public financing – is by almost 10 percentage points lower than the level registered in 2008. The average length of stay in hospital is longer than the EU average by 2 days, which is mostly attributable to the inadequate cooperation between the social and health care system. In Hungary, 40 percent of the cataract removals, the surgery of the largest element number, was performed in same-day care in 2017; this ratio, despite the rise in recent years, is still less than half of the EU average. Furthermore, it represents major efficiency reserves that – primarily due to the popularity of over-the-counter medicines – the level of pharmaceutical expenditures as a percentage of GDP is the third highest in the European Union.

4.84 Healthy life years



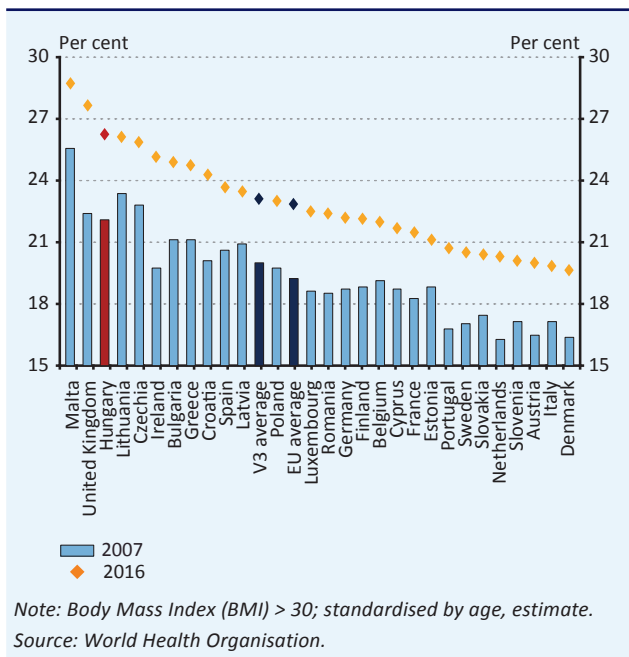
The healthy life years indicator tries to boil down the health status of a given society into a single ratio by taking into consideration the population’s mortality (death statistics) and morbidity (assessment of the inhabitants’ own status). In 2018 in Hungary the healthy life expectancy exceeded the average of the V3 countries, while it fell short of the EU average. On average, Hungarian women and men live in health 61.8 and 60.4 years. Of the Visegrád countries, Czechia and Poland performs better, while Slovakia’s figure is substantially lower. This figure for the population of the European Union is higher by 2.9 years than in Hungary (women: 64.2; men: 63.7)

4.85 Immunisation rates for childhood vaccinations (2018)



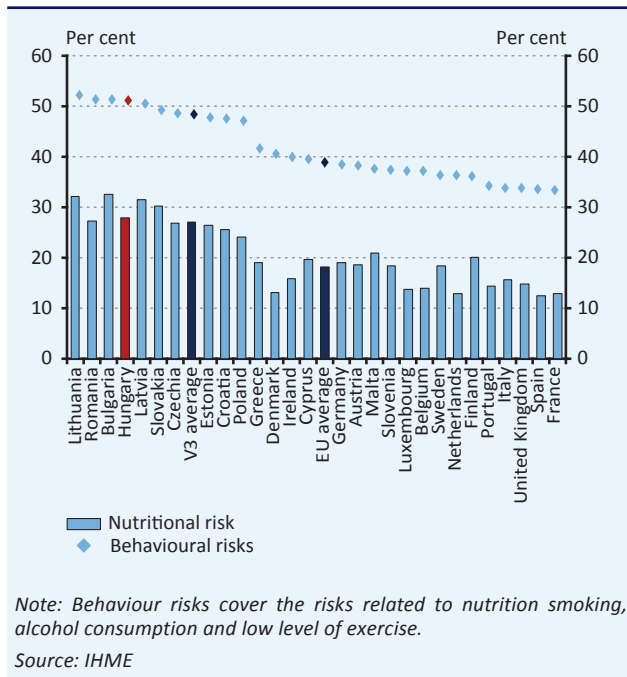
In Hungary the children’s vaccination rate can be deemed outstandingly high even by worldwide standards. In Hungary immunisation is practically complete (99 percent) in the case of the DTP (diphtheria, tetanus, and pertussis) and measles vaccination among 2-year-old children. The average of the EU countries is 94 percent at both vaccines, while in the other Visegrád countries the vaccination rate is also only 96 and 95 percent. In Hungary, with the introduction of the vaccine against chicken pox in 2019, the number of mandatory vaccines tied to age rose to 12. The low vaccination rates of certain countries contributed to the fact that measles, which formerly almost fully disappeared, in several European countries (e.g. Ukraine, Romania, France) once again caused epidemic in recent years.

4.86 Ratio of obese adult population



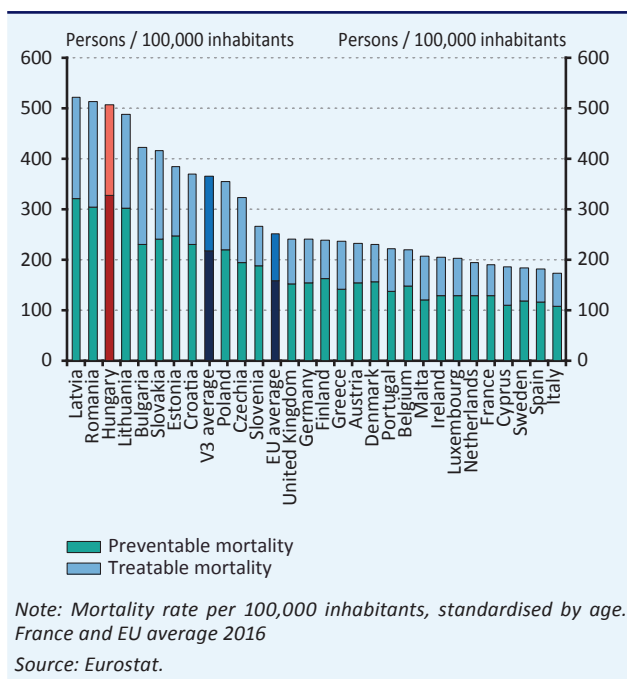
Obesity (BMI > 30) is an increasingly serious problem in European countries as it contributes significantly to the increase in health expenditures through the related illnesses (such as diabetes and hypertension) and to the decline in the potential economic performance. In the European Union, 23 percent of the population older than 18 years are obese, while the average of the Visegrád countries was slightly higher than that. In Hungary 26 percent of the adult population may be deemed obese, which is the third highest value in the EU, after Malta (29 percent) and the United Kingdom (28 percent). In 2007 only 22 percent of the Hungarian population was obese; accordingly, the ratio rose by 4 percentage points in 10 years. The prevention of obesity is one of the most efficient ways of improving the health status. Striving for healthy nutrition, regular exercise and curbing smoking and alcohol consumption could substantially contribute to the improvement of the Hungarian health care and economic results.

4.87 Share of mortality driven by behavioural risks (2017)



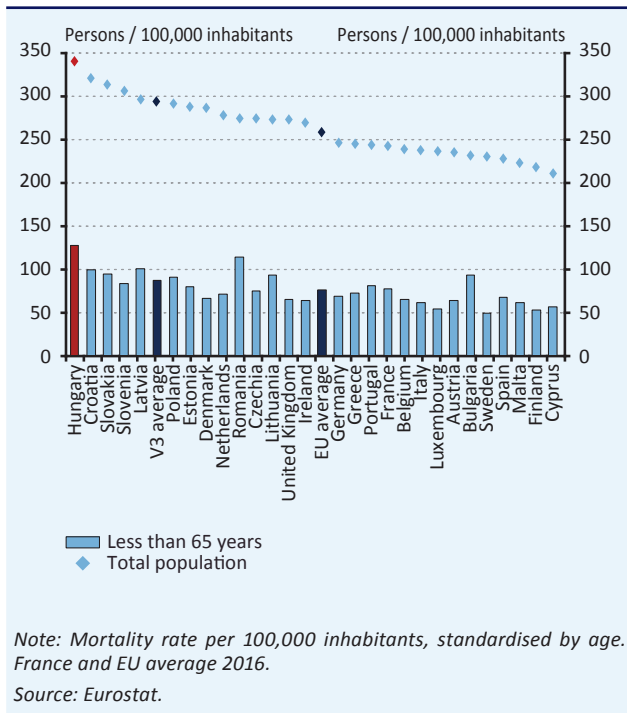
In Hungary, more than half of all deaths (51.1 percent) can be linked to some sort of behaviour risk, which is the fourth highest value in the European Union. The average of the V3 countries in this ratio was 48.3 percent, while that of the EU countries was 38.7 percent in 2017. When the individual behaviour risks are examined separately (which may also overlap), we find that Hungary's lag is particularly large in nutritional risks (28 percent, exceeding the EU average by 10 percentage points); in addition, Hungary is also among the 5 countries that perform the poorest in risks connected to the consumption of tobacco products and alcohol.

4.88 Avoidable mortality (2017)



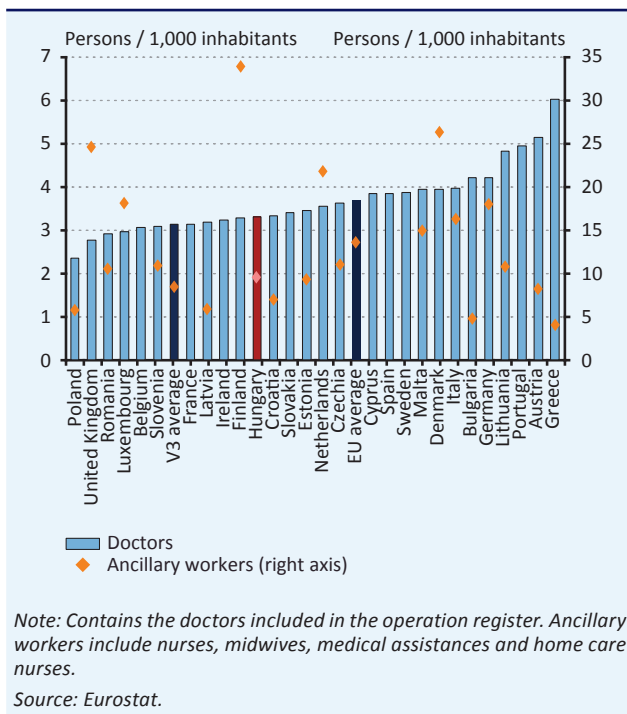
The concept of avoidable mortality covers deaths which could have been prevented or avoided by the proper application of the existing achievements of medical science. Within that there are two disjunct groups: preventable deaths are death that could have been avoided by proper prevention and treatable deaths are deaths that could have been avoided by proper health care interventions. In 2017, Hungary had the third highest standardised avoidable mortality in the European Union (506 persons / one hundred thousand inhabitants). The Hungarian mortality rate is the double of the EU average (252) and exceeds the average of the other Visegrád countries by almost 40 percent. Although between 2011 and 2017 the Hungarian mortality rate declined by 9 percent, a similar decrease was observed in the average of the EU and the V3 countries, and thus Hungary's lag did not decrease in this ratio.

4.89 Standardised death rate – Malignant neoplasm (2017)



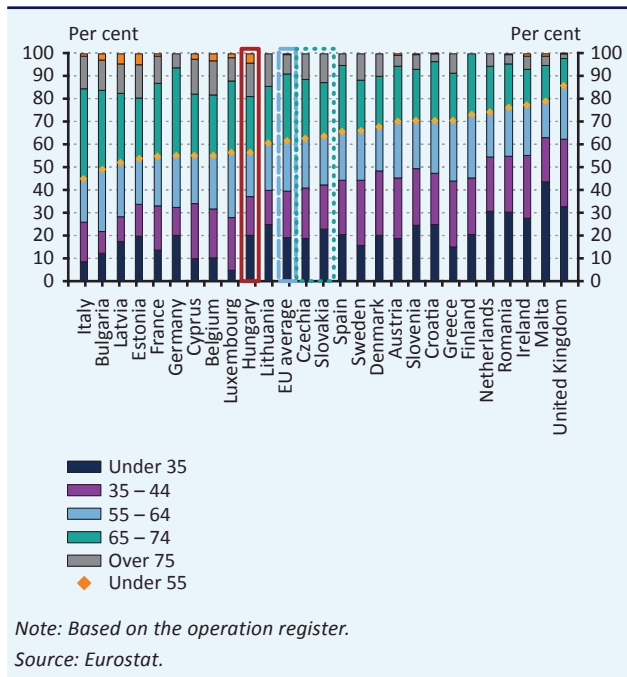
The standardised mortality rate shows what a country's mortality rate would be like if its distribution by age corresponded to the standard European population. The standardised mortality rate of malignant tumours is the highest in Hungary within the European Union. In 2017 in Hungary the number of deaths per 100,000 inhabitants was 342 within the whole population and 128 in the age group under 65. Both values are much higher than the averages of the countries of the region (295 and 87) and the EU (295 and 76). Nevertheless, in Europe and within that also in Hungary, there is a decreasing trend in the mortality rate of malignant neoplasm. Between 2011 and 2017, the mortality rate related to malignant neoplasm decreased to the second largest degree in Hungary among patients below 65 years (from 149 to 128); however, even this decrease was not sufficient for moving upper in the ranking of EU countries. The expansion of screening examinations could play a prominent role in reducing deaths due to malignant tumours as timely diagnosis would improve the chances of survival in the case of most tumours.

4.90 Number of doctors and ancillary workers per thousand inhabitants (2017)



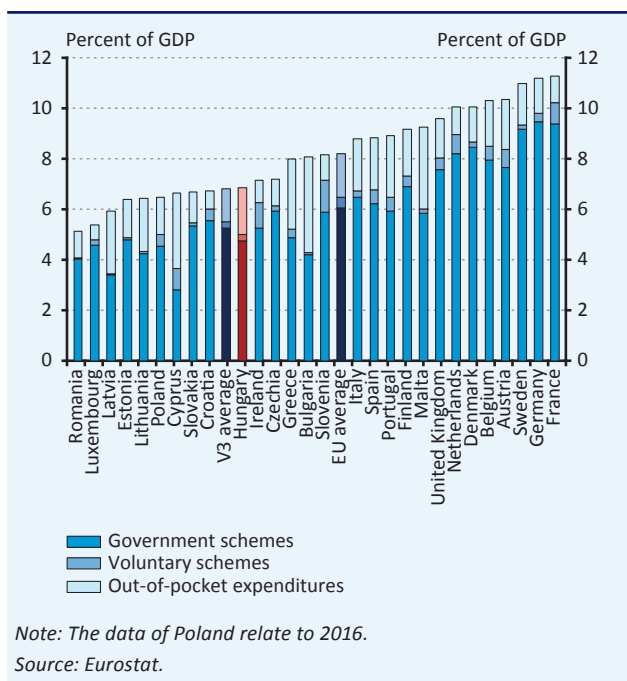
The number of doctors holding a licence to practise per 1,000 inhabitants is slightly higher in Hungary (3.3) than the average of the other Visegrád countries (3.2), but is lower than the EU average (3.7). The value of the ratio is influenced by the decline in population as well as by the delayed retirement and ageing of doctors. Moreover, the indicator shows the number of physicians who have a licence to practice in the given country, but not all of them play a role in the provision system (e.g. career changer) or actually work in that country. The number of the employed medical ancillary workers develops similarly as that of doctors: the number of ancillary workers in Hungary as a percentage of the population (9.5) is higher than the V3 average, but it is below the EU level (13.7). However, it should be noted that while in Hungary the ratio of ancillary workers to doctors is 3, this ratio in the European Union is 3.7 on average, while in the truly developed health care systems it may be the multiple of this (for example: the Netherlands 6.1; United Kingdom 8.9; Finland 10.3).

4.91 Physicians by age (2017)



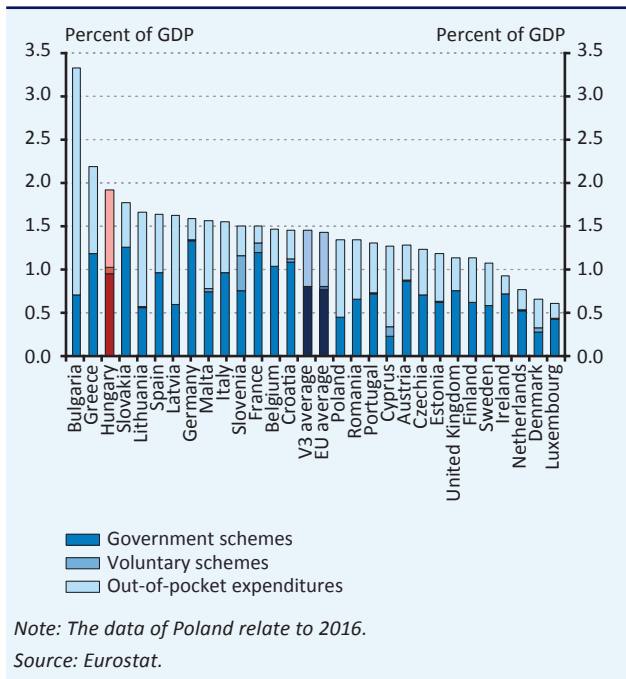
The ageing of physicians is not typical only in Hungary, as it is a general challenge in health care in Europe. In the EU countries, on average, 38 percent of the doctors were older than 55 in 2017, which exceeds the value registered in 2015 by 3 percentage points. In Hungary this ratio is 43 percent, while in Italy is 55 percent, in Czechia 37 percent, and in the United Kingdom it is merely 14 percent. The ratio of physicians younger than 35 years is 20 percent in Hungary, which is slightly above the EU average (19 percent). At the same time, it is a problem in Hungary that 19 percent of the doctors with a licence to practise are over 65 years, which is the second highest value among the EU countries after Estonia (20 percent). The fact that many of the European countries struggle with the problem of the ageing of doctors contributes to the emigration of doctors to Western and Northern European countries, where financial conditions are more favourable than in Central and Eastern Europe.

4.92 Health care expenditures as a percentage of GDP by financing scheme (2017)



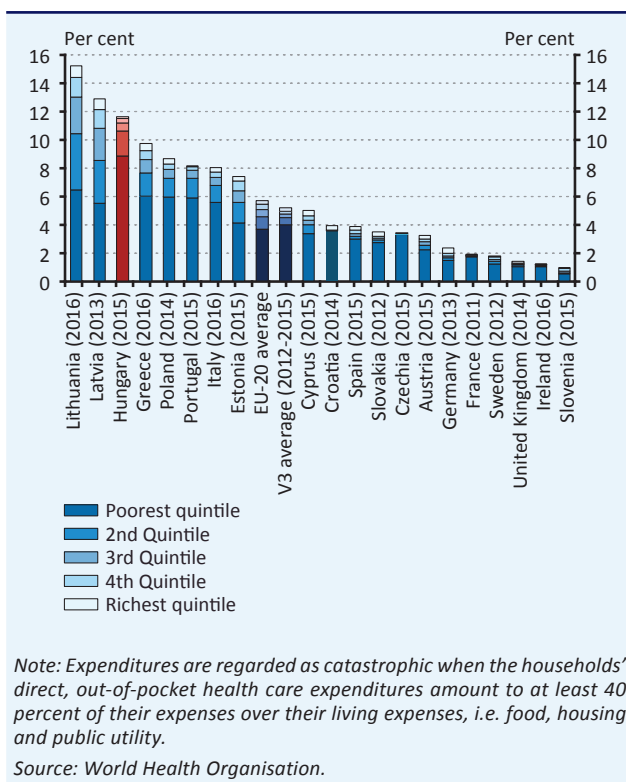
Hungary's health care expenditure as a percentage of GDP (6.9 percent) slightly exceeded the average of the other Visegrád (6.8 percent), but it was lower than the average of the EU Members States (8.3 percent) in 2017. The average level of the health care expenditures as a percentage of GDP has not changed significantly since 2010 in the European Union and in the region, while Hungary registered a moderately decreasing trend. In Hungary the public health care expenditures amounted to 4.8 percent of GDP, which falls short of both the regional (5.3 percent) and the EU average (6.1 percent). By contrast, in Hungary the households' out-of-pocket health care expenditures (1.9 percent), exceed both the EU (1.8 percent) and the V3 average (1.3 average). All this means that in Hungary, 69 percent of the health care expenditure comes from public sources, which is lower than the average of the European Union and the Visegrád countries by 4 and 8 percentage points, respectively. Voluntary schemes cover 4 percent in Hungary, which roughly corresponds to the regional and the international level.

4.93 Pharmaceutical expenditures as a percentage of GDP by financing scheme (2017)



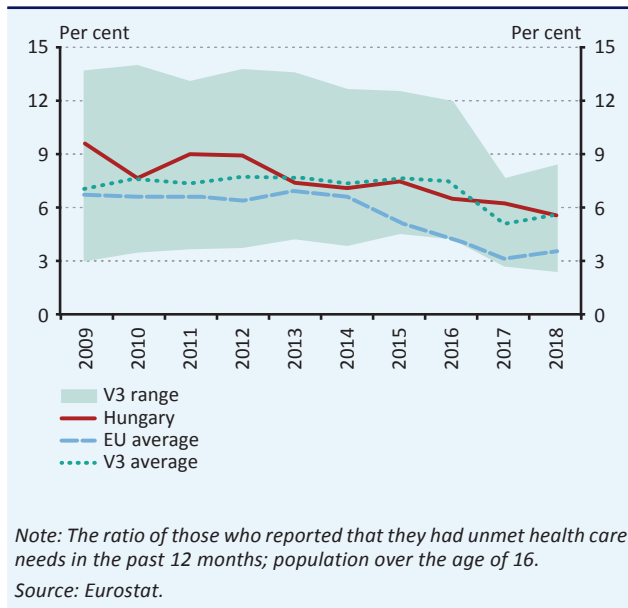
Hungary’s pharmaceutical expenditures as a percentage of GDP is the third highest one in the European Union. In 2017, Hungary spent 1.9 percent of GDP for the purchase of medicines, which is substantially higher than the V3 (1.5 percent) and the EU average (1.4 percent). Within total health care expenditure Hungary allocated 28 percent for the purchase of pharmaceuticals, while this is only 17 percent in the EU, on average. The difference primarily comes from the medicines purchased from households’ out-of-pocket expenditures, which amounted to 0.9 percent of GDP in 2017, and which exceeds the average of the EU and regional countries by almost one third. The inadequate health status of the population, the low level of adherence, the structural problems of the provision system, the slight regulation of medical sales representatives and the penetration of medicine advertisements all contribute to the high pharmaceutical expenditure in Hungary.

4.94 Share of households with catastrophic spending on health



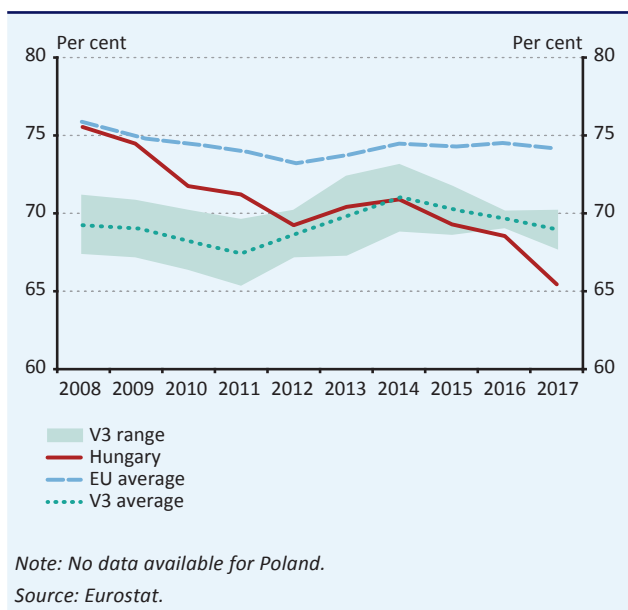
One of the most important indicators assessing the financial protection function of the health care system is the ratio of households incurring catastrophic health care expenditures, which reckons the households whose direct, out-of-pocket health care expenditures amount to at least 40 percent of their expenses over their living expenses (i.e. food, housing and public utility). In Hungary the ratio of these households was 11.6 percent, which is more than twice as high as the EU (5.7 percent) and the V3 average (5.2 percent), and it is the third highest among the EU countries assessed to date. The ratio was particularly high in Hungary at the households belonging to the lowest income quintile, as the health care expenditures of 44 percent of the households belonging to this category exceeded the level deemed catastrophic. This ratio was 20 percent in the Visegrád countries, while it was merely 3 percent in Slovenia. Overall this shows that the high ratio of the households’ out-of-pocket health care expenditures in Hungary poses major problems for almost one eighth of the households. The expansion of the role of the voluntary schemes may considerably contribute to managing this challenge.

4.95 Self-reported unmet needs for medical examination



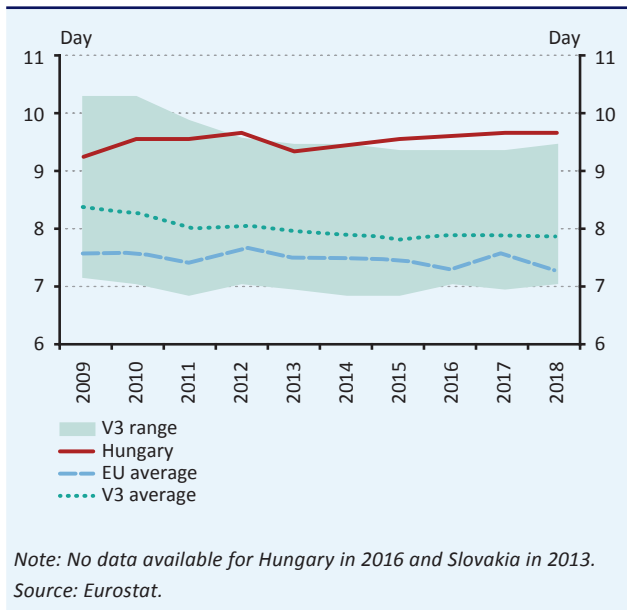
The volume of unmet health care needs is an important indicator of the health care systems' protection function, which shows what part of the population had such health care needs in the previous 12 month, which could not be satisfied for some reason. In Hungary, the ratio of the unmet health care needs was 5.6 percent in 2018, which is lower by 4.2 percentage points than in 2009. In the same period, the EU average fell from 6.8 percent to 3.5 percent, while the average of the other Visegrád countries declined from 7.2 percent to 5.7 percent. The reasons influenced primarily by the health care system ("too expensive", "too far to travel" or "waiting list") accounted for only 0.8 percentage point for Hungary, which is substantially lower than the EU average of 2.0 percentage points. On the other hand, the reasons primarily influenced by the health awareness of the population ("no time", "fear of doctor, hospital, examination or treatment", "wanted to wait and see if problem got better on its own") together amounted to 4.4 percentage points in Hungary, compared to the 1 percentage point EU average.

4.96 Curative care bed occupancy rate



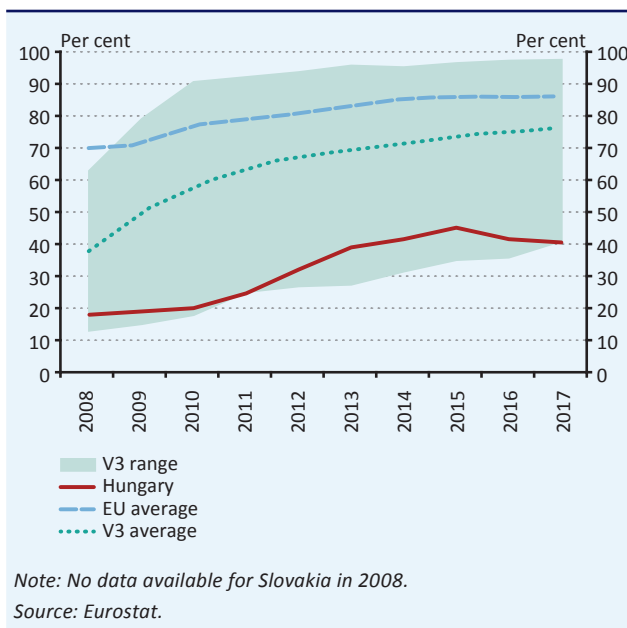
One key issue in service management is the number of beds needed for curative care in hospitals. The indicator of the efficient utilisation of capacities is bed utilisation, with a level of 70–85 percent considered desirable in the relevant literature. In Hungary, the bed occupancy rate was 65.5 percent in 2017, which – due to the gradual decline – is by almost 10 percentage points lower than the level registered in 2008. The average of the EU countries was 74.0 percent, while the average of Czechia and Slovakia was 68.9 percent in 2017. In the EU only 3 countries achieved 80 percent, of which the result of 94.9 percent achieved by Ireland rather suggest the underestimation of hospital capacities. The low bed occupancy rate in Hungary implies the existence of major efficiency reserves.

4.97 Inpatient average length of stay



In Hungary the average length of stay in hospital was 9.6 days, which exceeds the EU average (7.3 days) by 2.3 days and the regional average (7.9 days) by 1.7 days. While in the other Visegrád countries this indicator shows a moderately declining trend, in Hungary the length of the average stay in hospital increased by 0.4 day between 2009 and 2018. The average length of stay in hospital is primarily influenced by chronic care in Hungary. The Hungarian analyses, prepared by a slightly different methodology, show that in acute care the number of days of treatment per hospital case was steadily around 6 days in the period under review. By contrast, the length of the cases at the chronic, and within that the long-term care wards shows a moderate increase.⁶ All this suggests that in Hungary there is inadequate cooperation between the social and health care provision system, and those elderly, chronic patients are also treated in the health care system, whose condition would not necessarily require this.

4.98 Ratio of cataract surgeries performed in same-day surgery and outpatient care



Cataract surgeries are among the most frequent surgeries performed in developed countries, where there is no technical obstacle to performing the surgery without staying in hospital. In Hungary 40 percent of the cataract surgeries were performed as same-day surgery in 2017, which is by almost 23 percentage points more than in 2008. Of the Visegrád countries, in Poland the ratio of surgeries performed in same-day care was also 40 percent. By contrast, in Slovakia (91 percent) and in Czechia (98 percent) the vast majority of the surgeries were already performed in this form. The expansion of the same-day surgeries represents major efficiency reserve in the Hungarian health care system, which could contribute to the reduction of the hospital focused approach.

⁶ Health System Performance Assessment Working Group (2016): Performance assessment of the Hungarian health care system 2013-15. National Healthcare Service Centre, Budapest.

4.9 KNOWLEDGE-BASED SOCIETY

Through the quality and productivity of the available workforce, education has a major impact on the economic performance and competitiveness of a country. At the same time, it is not easy to measure the efficiency of the educational system, as in the case of a university graduate – starting from the kindergarten – we can speak about at least 18 years of education, where it is difficult to clearly determine the exact value added of the individual levels of education.

International tests measuring the effectiveness of the educational system show that Hungarian students learn the curriculum as expected of them, at the same time, in the case of examples taken from real-life they are less able to use this knowledge to an adequate degree. The TIMSS and PIRLS tests completed by students from grade 4 focus mainly on checking the curriculum learnt. In these tests, Hungarian students performed above the average of regional and EU countries. By contrast, in the PISA tests, which examine how students can use the learnt curriculum in real life examples, the Hungarian results were below both the regional and European average levels. However, in the latest, 2018 tests the declining trends of the previous years turned, and thus the average score of Hungarian students is below the EU average by only 6 points. The improvement in the Hungarian results is mostly attributable to the fact that the ratio of underperforming students (those who do not reach the minimum target level in any of the assessed areas) significantly declined, but it is still higher than the international average. At the same time, the Hungarian results are still very much determined by the social and economic background of the students.

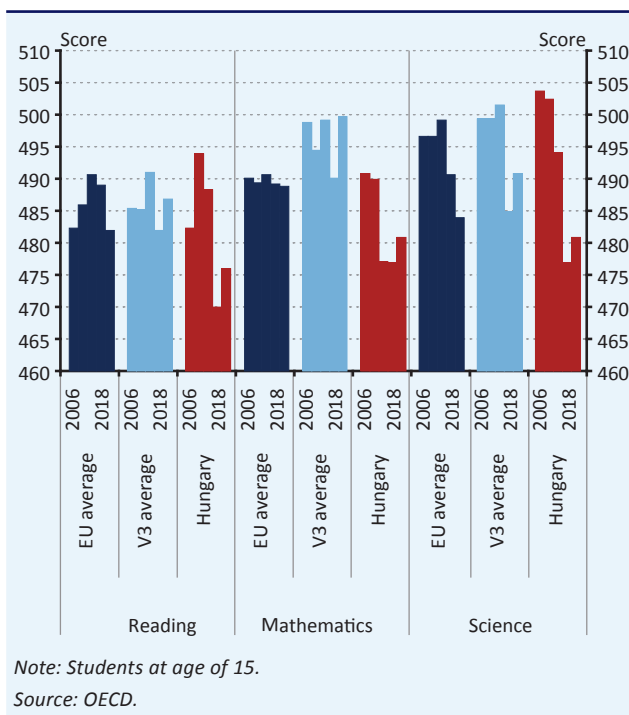
In 2016, Hungary spent 4.3 percent of GDP on education expenses, which exceeds the average of the other Visegrád countries (3.8 percent) by 0.5 percentage point, but it is slightly lower than the EU average (4.4 percent). In Hungary, the rate of public expenditures is 3.5 percentage point, which is also between the EU and the regional average, while the role of private funds slightly exceeds the international level. However, financial reward for the teaching profession in Hungary lags behind – similarly to the EU and regional practice – that of other occupations requiring tertiary education degree. In Hungary the average wage of public education workers amounts to 64-74 percent of those holding tertiary education degree. In the case of school teachers this corresponds to the average of the other Visegrád countries, but it is substantially lower than the average level of the EU countries, being 85-95 percent of the graduates' average wage.

In Hungary, the degree of early school leaving without qualification is almost twice as high as the average of the other Visegrád countries, while the ratio of those holding a tertiary education degree is one of the lowest among the EU countries. 12.5 percent of the young people in the age group of 18-24 years do not participate in further education despite having only primary education or less. The improvement of this ratio would be important because for young people with no secondary or vocational qualification it is much more difficult to find a job in the labour market, and many of them become economically inactive for a long time. In the age group of 25-34 years the ratio of tertiary education graduates in Hungary was 31 percent in 2018, which corresponds to the level registered in 2012 and it is the third lowest value in the European Union. The EU average in this indicator rose by 8 percentage points within 10 years from 32 percent registered in 2009, while the other Visegrád countries achieved an even larger improvement (from 25 percent to 38 percent). It is partly due to this fact that the wage premium of the tertiary education degree in Hungary is outstanding in an international comparison. In Hungary, the ratio of young people with STEM degree (12 percent) is the fourth lowest among the EU countries, while among the new graduates the number of degrees obtained in STEM programs already corresponded to the regional average and it was only slightly lower than the EU average. Participation in lifelong learning affected 6 percent of the adult population in Hungary, which corresponds to the regional level, but in order to maintain the dynamic economic growth it would be necessary to catch up with the EU average (11 percent) in this area.

Based on the international rankings of tertiary education institutions, the Hungarian universities are not in the vanguard of the world, while the ratio of international students studying in the Hungarian tertiary education institutions exceeds the average of the EU. At present none of the Hungarian universities belongs to the world's top 500 tertiary education institutions in the QS university ranking, while there are 8 Hungarian universities in the list ranked between 501 and 1000. Nevertheless, in the Hungarian undergraduate education the ratio of international students corresponds to the EU average (7 percent), while in the masters courses it even exceeds it (17 percent versus 13 percent).

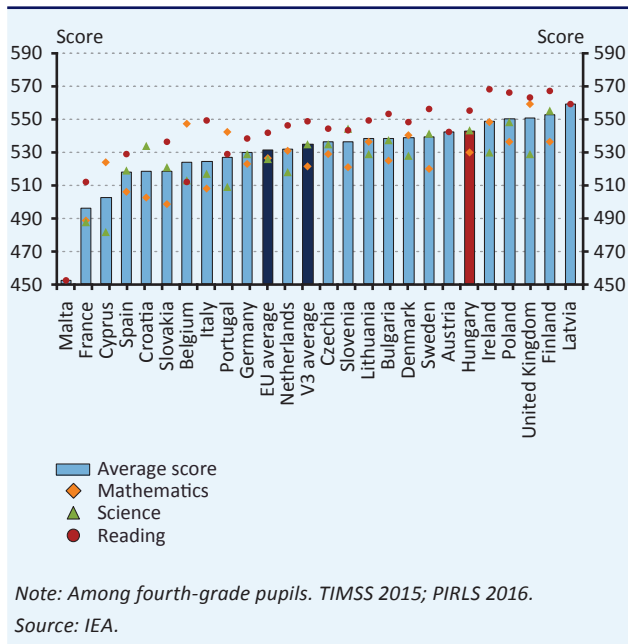
The numeracy competence of the adult population exceeds the international average, while there is a lag in foreign language and financial skills. Hungary also joined the OECD’s Programme for the International Assessment of Adult Competencies (PIAAC), the results of which show that the skills of Hungarian employees (numeracy, literacy) correspond to the average level of the European Union, which confirms that the lower productivity of Hungary cannot be attributed to lack of the employees’ basic skills. However, the foreign language skills of the Hungarian population are substantially below the average EU and regional level, which reduces the access of the individual employees to knowledge-sharing channels, and represents major competitive disadvantage for the Hungarian economy. Furthermore, it is also a problem that the digital skills of the Hungarian youth at present lag behind those of young people in the region and in the EU; moreover, the results in this area tend to follow a deteriorating trend. The financial literacy of the Hungarian population also lags behind the expected level; however, there are comprehensive interventions in this area (e.g. according to the amended National Core Curriculum, basic financial skills will be included in several subjects from September 2020) in Hungary, which is expected to increase the population’s skills level in the long run.

4.99 Results of PISA tests



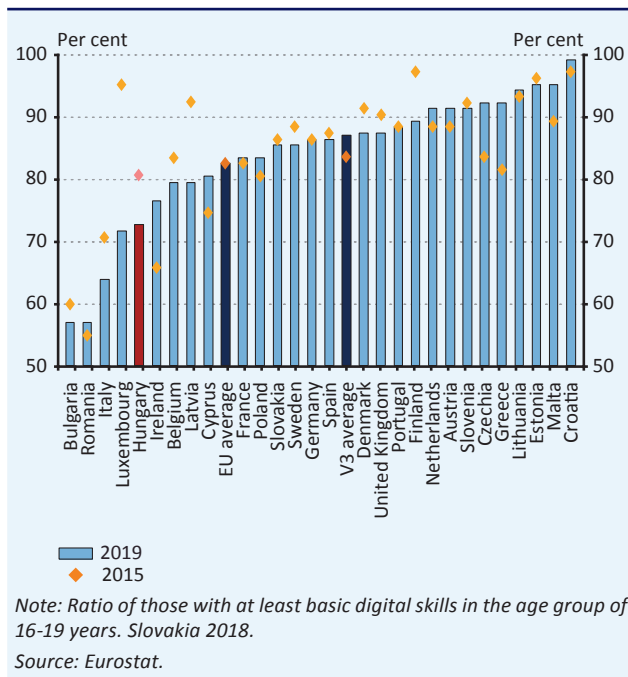
The PISA test organised by the OECD every 3 years examines the competences of 15-year-old students in 3 selected areas (mathematics, science, reading). In the latest, 2018 tests, Hungarian students achieved higher scores in all three areas than in the 2015 tests. Despite the rising scores, Hungary’s results still lag behind the average of the countries of the region and the EU in all three areas. In 2018, the average results of the V3 countries improved to a larger degree than those of Hungary (by 7 points on average versus Hungary’s 5 points), while the average of the EU countries declined by 5 points. The improvement in the Hungarian results is mostly attributable to the fact that the ratio of underperforming students (those who do not reach the minimum target level in any of the areas) significantly declined, but it is still higher than the international average. The Hungarian results are still very much determined by the social and economic background of the students. The difference between the performance of the second and the ninth decile of students was the largest in Hungary (126 points) among the EU countries.

4.100 Results of TIMSS and PIRLS tests (2015, 2016)



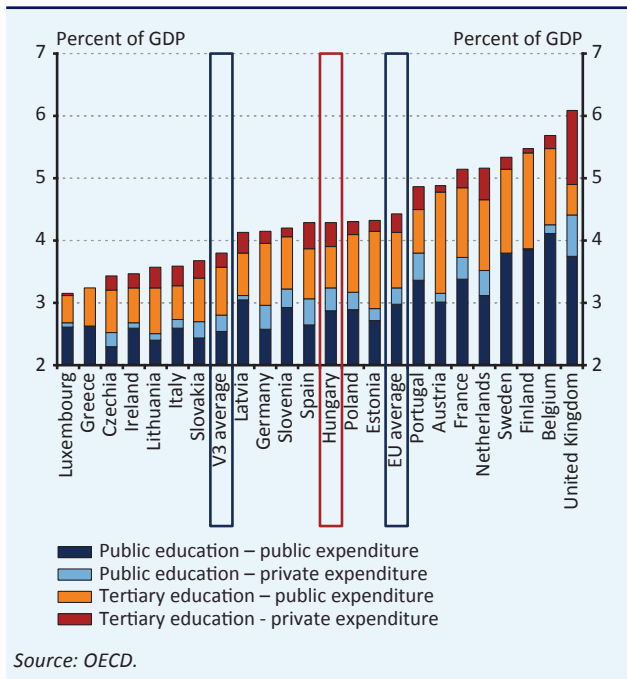
The TIMSS and PIRLS surveys conducted by the specialised institution of Boston College measure the knowledge of 4th grade (and with a more limited scope the 8th grade) students every 4 years. The TIMSS survey performed in 2015, assessed the students’ mathematical and science knowledge, while the PIRLS survey conducted in 2016 monitored literacy. The Hungarian fourth-grade pupils scored 542 on average in the two surveys, being the 6th highest one among the participating 24 EU countries, whose average is 530. Of the Visegrád countries, Poland performed the best (549 scores), while the performance of both Czechia (535 scores) and Slovakia (518 scores) was below the Hungarian level. Hungarian students outpaced the V3 and the EU average in all three areas. Hungary achieved the lowest score (529) in mathematics, while in sciences (542 scores) and in literacy (554 scores) it was among the leaders. The TIMSS and PIRLS surveys – contrary to the skill-measuring PISA tests – primarily focus on the verification of the learnt curriculum, where Hungary performs well in an EU comparison. The results of the curriculum and skills assessment surveys collectively show that although Hungarian students learn the curriculum as expected of them, in the case of real life examples they are unable to use their knowledge to an adequate degree.

4.101 Digital skills in the age group of 16-19 years



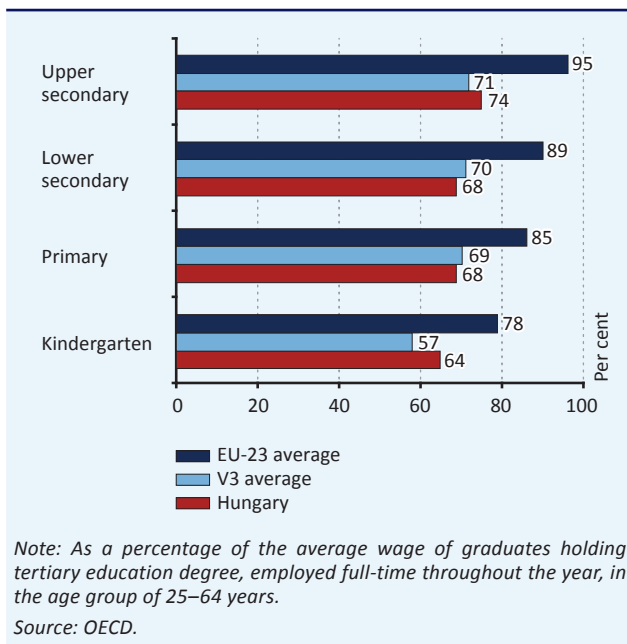
At present, the digital skills of the Hungarian youth lag behind the level of the youth in the region and the EU. Based on the Eurostat’s composite index measuring the level of digital skills, 73 percent of the Hungarian youth aged between 16 and 19 years have at least basic digital skills (e.g. they have already copied a folder on the computer or found information about a service in the internet), which is lower than the EU average by 10 percentage points and the average of the other Visegrád countries by 15 percentage points. Since the first survey conducted in 2015, the Hungarian results fell by 8 points, which is the third largest decline among the European countries. The EU average stagnated between 2015 and 2019, which implies that the European education systems were still not able to adjust sufficiently to the expectations of the digital age. However, it should be noted that several of the member states that joined after 2004 (particularly Croatia, Malta and Estonia) performed better in this indicator than the old member states.

4.102 Education expenditures as a percentage of GDP (2016)



In 2016, Hungary spent 4.3 percent of GDP on education expenses, which exceeds the average of the other Visegrád countries (3.8 percent) by 0.5 percentage point, but it is slightly lower than the EU average (4.4 percent). In Hungary, the rate of public expenditures is 3.5 percent, which is also between the EU and the regional average. The same applies to the government’s public education expenditures (2.9 percent), while the government’s tertiary education expenditures (0.7 percent) are slightly lower than the regional average (0.8 percent). The private expenditures spent on public education and tertiary education in Hungary are both slightly higher than the average of the other Visegrád countries and the EU member states. Overall, Hungary’s education expenditures correspond to the average level of the EU, but the role of private funds is slightly higher.

4.103 Teachers’ wages as a percentage of the average wage of tertiary education graduates (2017)

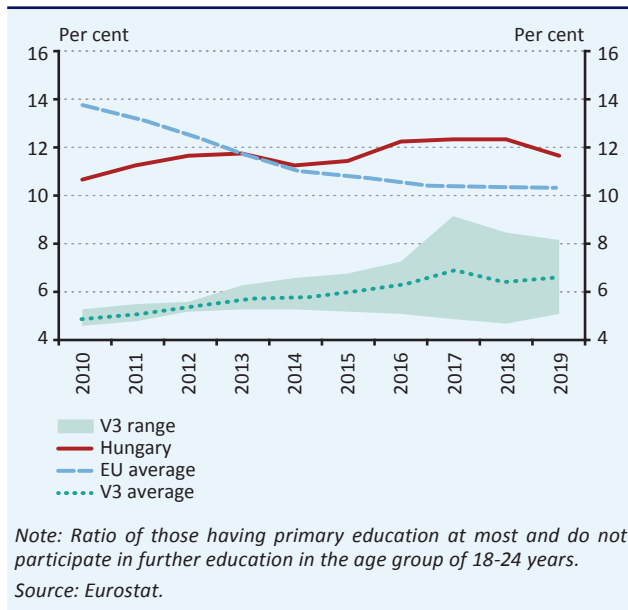


Financial reward for the teaching profession in Hungary lags behind – similarly to the EU countries – that of other occupations requiring tertiary education degree. In Hungary – despite the introduction of the career path model – the average wage of public education workers amounts to 64-74 percent of those holding tertiary education degree. This corresponds to the average of the other Visegrád countries, but it is significantly lower than the average level of the EU countries, being 85-95 percent of the graduates’ average wage. In Hungary the introduction of the teachers’ career path model in 2013 substantially increased teachers’ wages, but the Hungarian teachers’ wages failed to keep pace with the dynamic wage growth observed in the economy. The wages falling short of the expectations reduce interest in teachers’ profession and cause teachers leaving the profession.

Note: As a percentage of the average wage of graduates holding tertiary education degree, employed full-time throughout the year, in the age group of 25–64 years.

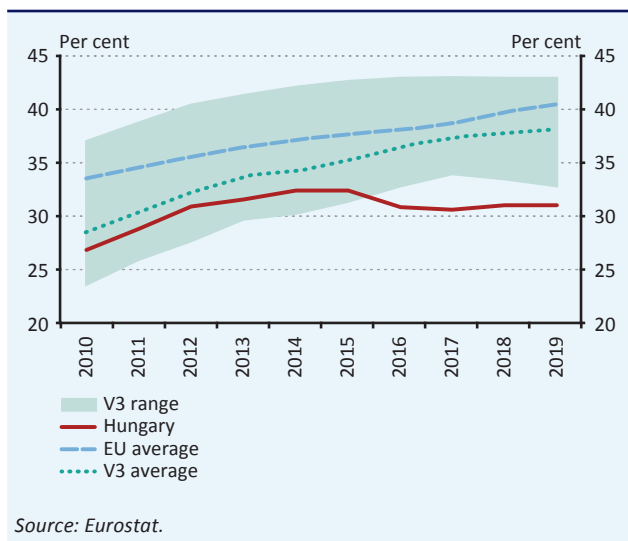
Source: OECD.

4.104 Early leavers from education and training



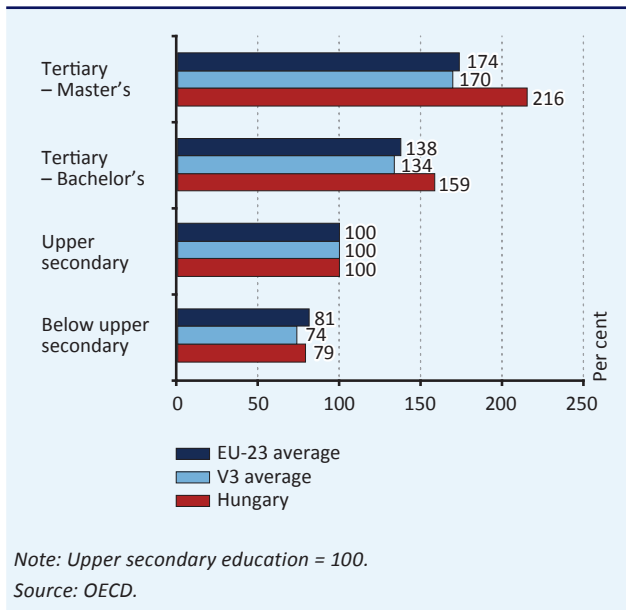
Early school leavers are people aged 18–24 who finished only elementary school at most and do not participate in any further education or training. In Hungary the rate of early school leaving without qualification was 11.8 percent in 2018, which exceeds the average of the other Visegrád countries (6.7 percent) by 75 percent. In the Europe 2020 strategy, the European Union has set 10 percent as the target to be realised; after 10 years of gradual decline, the EU average has already come close to this target by now. By contrast, in Hungary the level of early school leaving rose from 10.8 percent registered in 2010 to 11.8 percent. The other Visegrád countries also registered a growth (from 5.0 percent to 6.7 percent); nevertheless, Hungary’s regional competitors still achieve considerably better results. For young people with no secondary or vocational qualification it is much more difficult to find a job in the labour market, and many of them become economically inactive for a long time.

4.105 Tertiary educational attainment in the age group of 25–34 years



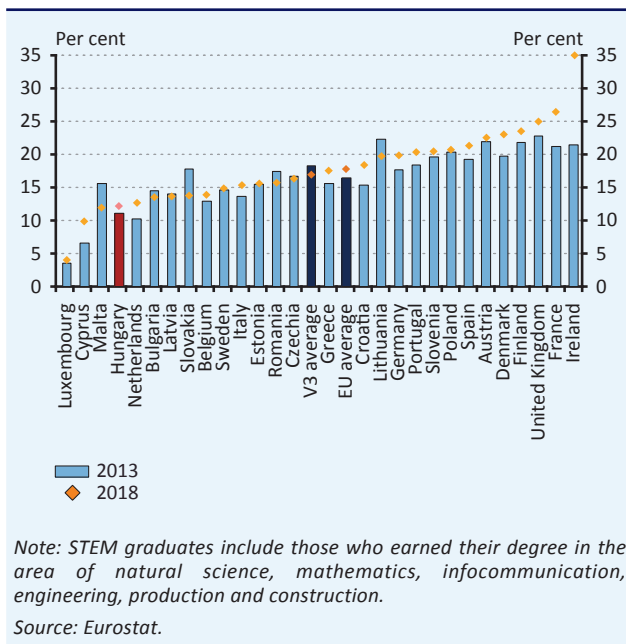
In Hungary, in the age group of 25-34 years the ratio of tertiary education graduates was 31 percent in 2019, which corresponds to the level registered in 2012 and it is the third lowest value in the European Union. The EU average rose by 8 percentage points within 10 years from 33 percent registered in 2010, while the other Visegrád countries achieved an even larger improvement (from 28 percent to 38 percent). By contrast, in Hungary the rise of 6 percentage points (from 26 to 32 percent) between 2010 and 2014 was followed by a moderate decline. The increase of the ratio of tertiary education graduates is indispensable for the change of economic model, since the availability of highly qualified employees in sufficient number is essential for the operation of the economic model driven by innovation.

4.106 Relative earnings of workers by educational attainment (2017)



In Hungary, due to the relatively low ratio of graduates, the wage premium of a tertiary education degree – compared to the wage of those with upper secondary education – is high in an international comparison. A bachelor degree earns by 59 percent higher average wage for the employee, while the wage of masters graduate is more than twice higher than the wage of those with upper secondary school qualification. This latter value is the highest among the EU member states, which means that it is particularly worth investing in tertiary education in Hungary. The employment data also show that it is worth continuing studies in tertiary education, since the employment rate of graduates (86 percent) is higher than that with upper secondary school qualification (78 percent). In the light of this it is not surprising that the long-term internal rate of return of public expenditure on tertiary education (i.e. the social benefit of obtaining tertiary education degree) is 9.5 percent, which exceeds the EU (8 percent) and V3 (7 percent) average⁷.

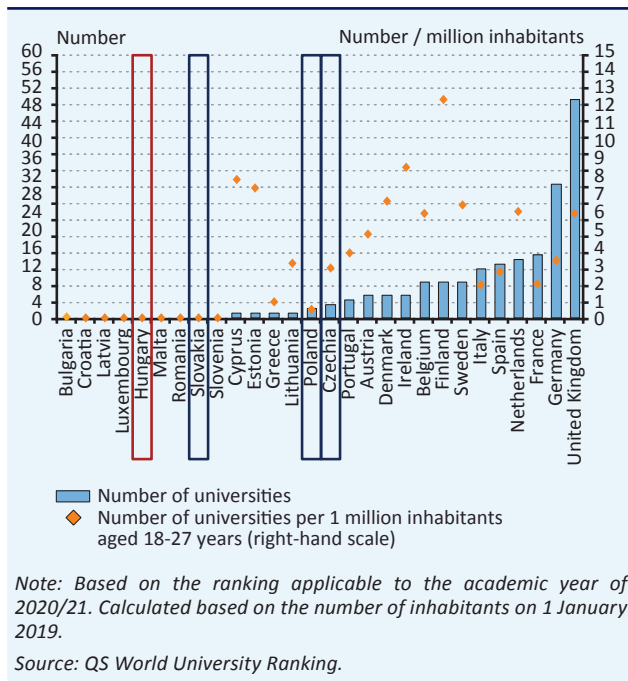
4.107 Ratio of STEM graduates in the age group of 20–29 years



In Hungary the ratio of STEM graduates is the 4th lowest among the EU countries. In 2018, in the age group of 20–29 years, 12 percent held a STEM degree in Hungary, which exceeds the value recorded in 2013 by 1 percentage point. The same ratio was 18 percent on average in the EU countries and 17 percent in the other Visegrád countries. The ratio of STEM graduates in the economy has major effect on innovation, and thus increasing the number of them can contribute to the changeover to the innovation-driven economic model. It is more favourable that in 2016 among the new graduates the ratio of STEM graduates was 23 percent in Hungary, which corresponded to the regional average and it was lower than the EU average only by 2 percentage points. Overall this shows that the low ratio of young STEM graduates available in the Hungarian labour market is primarily due to the low ratio of tertiary education graduates rather than to the unpopularity of these disciplines.

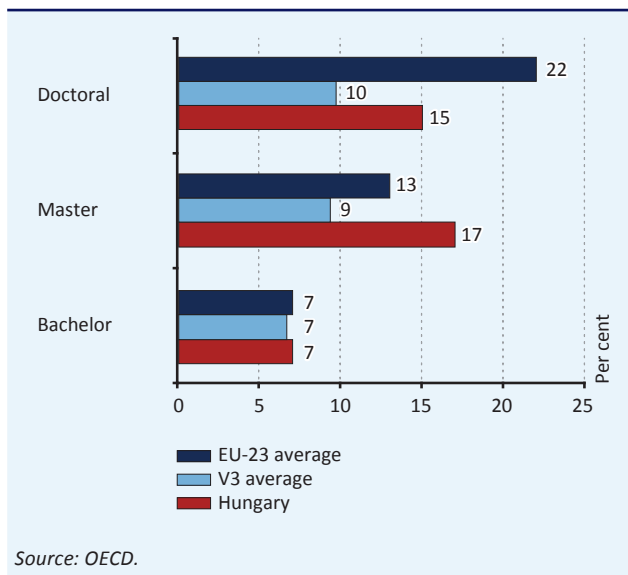
⁷ OECD (2019): Education at a Glance.

4.108 Number of tertiary education institutions ranked in the world's top 500 universities (2020)



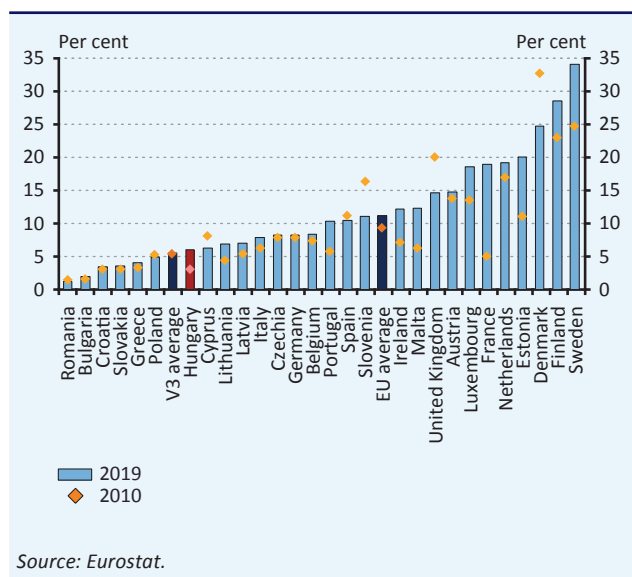
Based on the international rankings of tertiary education institutions, the Hungarian universities are not among the highest ranked institutions of the world. According to the QS World University Ranking no Hungarian institution is included among the world's top 500 universities (the University of Szeged is ranked 501-510). The whole list, consisting of 1,000 universities, contains 8 Hungarian universities in total. The best tertiary education locations are strongly concentrated in space: the top 500 universities of the world include 49 institutions in the United Kingdom, 30 in Germany and 14 in France. The new EU member states that joined since 2004 can claim only 8 such institutions in total (Czechia 3, Poland 2, and each of Estonia, Lithuania and Cyprus 1). When examining the number of top universities as a percentage of the population, the best tertiary education systems are in Finland, Ireland, Estonia, Cyprus and Denmark.

4.109 Ratio of international students by the level of tertiary education (2017)



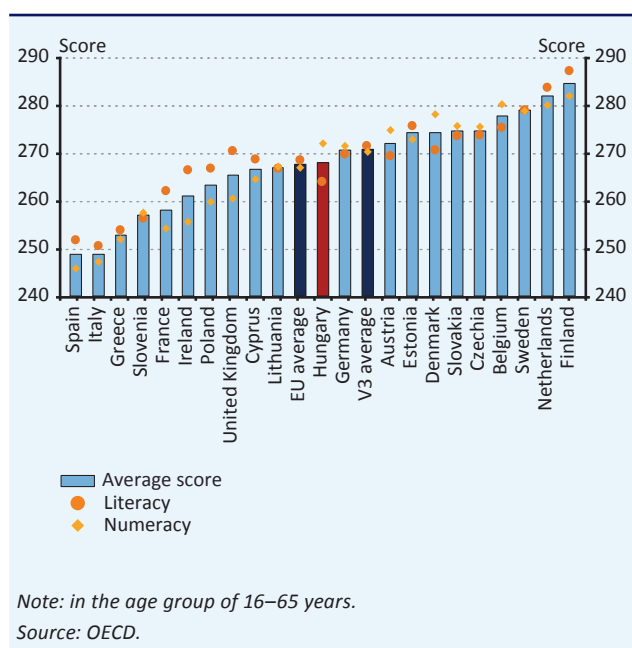
One good measure of the perception of Hungarian tertiary education system is the ratio of international students. In this area Hungary outperforms its regional competitors, and also exceeds the average EU level. In the Hungarian undergraduate education the ratio of international students corresponds to the EU average (7 percent), while in the masters courses it even exceeds it (17 percent versus 13 percent). In the area PhD training, involving substantially fewer students, the ratio of international students in Hungary is between the EU and the Visegrád average. In 2017, altogether 10 percent of the students came from abroad in Hungary, which exceeds both the regional (8 percent) and the EU average (9 percent). In 2010, the ratio of international students in Hungary was merely 5 percent, which doubled in 7 years.

4.110 Participation in lifelong learning



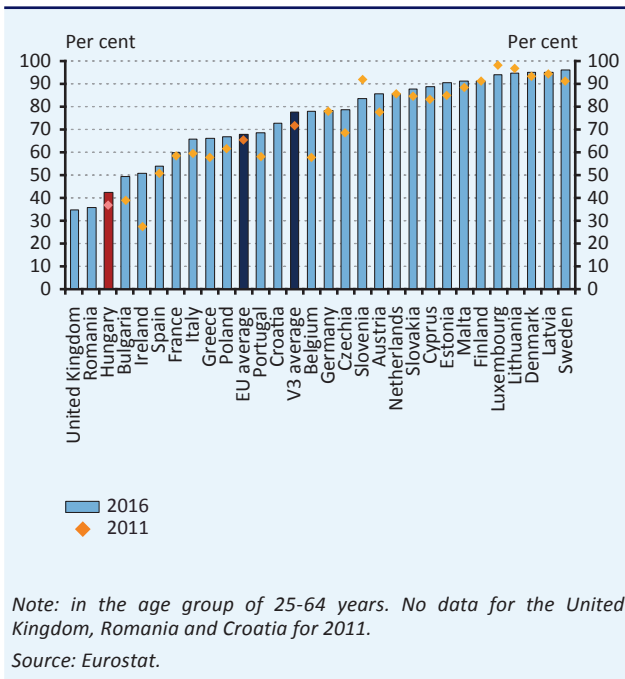
According to the Eurostat definition, in the 25–64 age group those are considered to be participants in lifelong learning who received some kind of training or education in the 4 weeks preceding the survey. The continuous training of employees becomes increasingly important in order to keep abreast with technological progress. In Hungary 6 percent of the adult population participated in lifelong learning in 2019, which slightly exceeds the average of the other Visegrád countries, but it is only roughly half of the EU average (11 percent). However, the change in Hungary is positive, which was also attributable to a methodological change: since 2010 the ratio of those continuously improving their skills rose from 3 to 6 percent, which growth exceeds both the regional and EU average. There are major differences in this indicator between the European countries: while in the Scandinavian countries the ratio of those participating in regular continuing training is above 25 percent, in Romania and Bulgaria this ratio is only 1 and 2 percent.

4.111 Results of the PIAAC test assessing adult competencies (2011–2017)



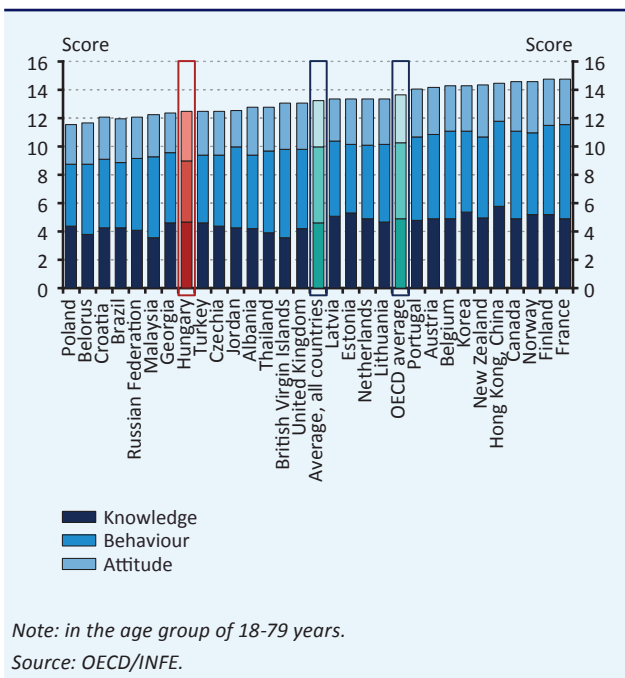
Between 2011 and 2017, the OECD assessed in its member states the basic competencies of the population aged between 16 and 65 years in the area of literacy and numeracy in three phases in total. Based on the assessment, the skills of the Hungarian population roughly correspond to the average level of the countries of the region and the EU. In the literacy test Hungary scored 264, which exceeds the EU average by 4 points, but is lower than the average of the other Visegrád countries by 8 points. In the area of numeracy Hungary scored 272, which was slightly exceeded by the EU (268) and the V3 (270) average. However, it should be noted that – contrary to the PISA tests measuring the skills of young people – in the tests assessing the adult population the ratio of the underperformers (i.e. those not reaching the minimum target) in Hungary (14 percent) was only moderately higher than the EU average (13 percent). The results of the PIAAC test show that the skills of Hungarian employees correspond to the average level of the European Union, which confirms that the lower productivity of Hungary cannot be attributed to lack of the employees' basic skills.

4.112 Ratio of people speaking at least one foreign language



In 2016, Hungary’s lag behind the averages of the countries of the EU and the region was significant in terms of the people who, by their own admission, speak at least one foreign language. A mere 42 percent of the Hungarian population spoke at least one foreign language, while the ratio of those who spoke at least two foreign languages did not reach 14 percent. By contrast, in the European Union on average 68 percent of the population spoke at least one foreign language, while this ratio was 78 percent on average in the other Visegrád countries in 2016. The high average value of the V3 countries is greatly attributable to the fact that in Slovakia – partly due to historical reasons – 88 percent of the population speaks at least one foreign language, while 28 percent of the population speaks 3 or more foreign languages. The absence of foreign language skills substantially reduces the opportunities of individual employees, as they have no access or have only limited access to several knowledge sharing channels (e.g. specialist literature, internet sources). All this in practice reduces knowledge, learning and innovation capacity, which curbs economic development.

4.113 Financial literacy (2014–2016)



Between 2014 and 2016 the OECD assessed the financial literacy of the adult population of 29 countries or economic units (the second round of the assessment, performed with the same methodology in 2017 included only the G20 countries). Hungary finished 22nd with 12.5 points in the test. Hungary is in the middle of the ranking (14th place) in financial knowledge, at the end of the ranking (29th place) in financial behaviour and among the leaders (3rd place) in financial attitude. The strongly varying rankings is mostly attributable to the fact that at the time of the assessment the financial standing of the Hungarian population have not permitted yet to save the amounts that they intended to save. However, this changed by 2019, since the Hungarian saving rate and the households’ net financial wealth are both high in an EU comparison, which projects an improvement in financial behaviour. The raising of financial literacy supports the unfolding of financial opportunities, while the low level of it curbs growth. It is also important to note that of the maximum reachable 21 points, even the one that received the highest score (France) reached only 14.8 points, while the average of participating OECD countries was 13.7 points.

4.10 RESEARCH, DEVELOPMENT AND INNOVATION

Competitive research and development (R&D) and innovation are preconditions for an economy that functions on the basis of the advanced, innovation-driven growth model. For the changeover from the investment-driven model to an innovation-driven model it is necessary to increase R&D expenditures and R&D personnel. However, the research, development and innovation ecosystem does not only depend on funding and headcount conditions, but also on the expansion and development of the innovation capacities of enterprises, easy access to the latest technologies and the spread of robotisation and digitalisation across the economy.

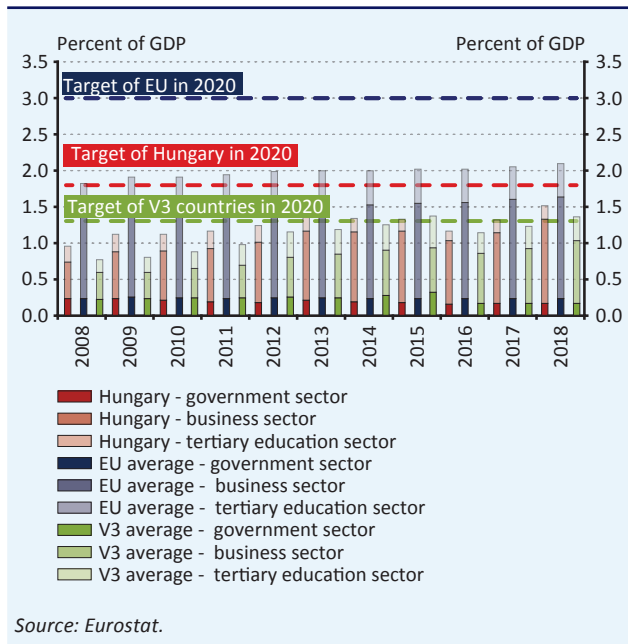
Hungary's innovation performance is below the EU average, but corresponds to the regional average. In Hungary, between 2008 and 2018 the R&D expenditure to GDP ratio rose from 0.98 percent to 1.53 percent, exceeding the average performance of the other Visegrád countries by 0.2 percentage point. Hungary has the second highest R&D expenditure in the Central and Eastern European region after Czechia. While the amount of business expenditures is high, Hungary falls short of the average of the EU countries and the Visegrád region in the areas of tertiary education R&D expenditures. The headcount of R&D employees in the Visegrád countries rose almost at an identical rate between 2008 and 2018; however, the region failed to come closer to the dynamically increasing EU average. It is positive that the Hungarian R&D headcount, which followed a declining trend between 2014 and 2016, has been once again increasing since 2017.

The number of new patents registered in Hungary annually is considerably lower than the EU and Visegrád average, which – under increasing research and development expenditures – implies inefficient utilisation of resources. Firstly, the low Hungarian value is attributable to the fact that large multinational companies register new technological achievements in their respective home countries even if they were not developed there. Secondly, most of the knowledge-intensive business research activity is carried out in the core countries of the EU. In addition, the high maintenance fees also curb the growth in the number of patents in Hungary. In the past two decades, research efficiency followed a declining trend in Hungary, evidenced by the permanent fall in the number of patents per one unit of research and development expenditure.

The innovation capacity of the Hungarian SME sector is in the last quarter of the EU Member States, substantially lagging behind the EU average and moderately falling short of the average of the other Visegrád countries. The ratio of SMEs performing product and process as well as organisational and marketing innovation (18 percent) is on the rise since 2009, but it is still below the EU average (34 percent). The improvement in the product and process innovation indicator reflects the gradual adoption of new technologies, robotisation and digital solutions. There is also some progress in the field of organisational and marketing innovation, which facilitates convergence in corporate governance and management competences. However, less than one tenth of the Hungarian SME sector use big data methods, and substantial lag can be also identified in the application of cloud technologies, enterprise resource planning software and robots, and in the area of 3D printing. The innovation capacity of Hungary is usually characterised not only by single indicators, but also by composite indices. In the European Commission's Composite Innovation Index Hungary is ranked twenty third among the EU countries. However, based on Bloomberg's Innovation Index and the Global Innovation Index prepared jointly by the Cornell University, INSEAD and the World Intellectual Property Organisation Hungary's innovation ecosystem is more advanced. Based on the Bloomberg Innovation Index, Hungary slightly exceeds the EU average and it is in the middle range in the ranking of EU member states, while in the Global Innovation Index it preceded the average relative position of the other Visegrád countries by one place in 2019.

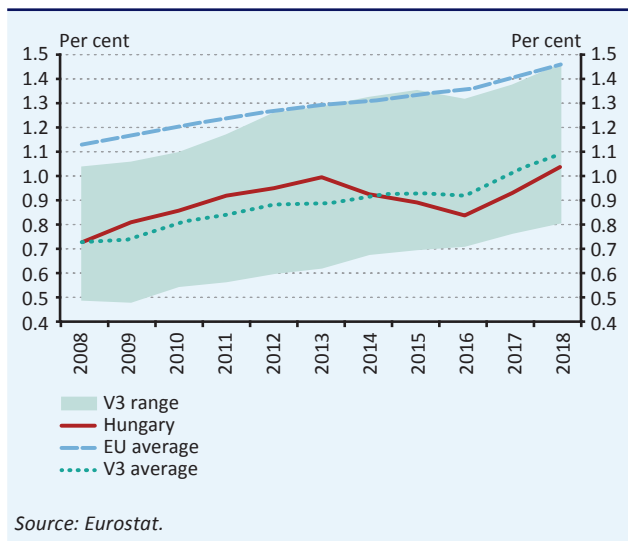
In the field of digitalisation, it is primarily the development and spread of enterprise digital technologies as well as the spread of e-commerce solutions and an improvement in the quality and usage rate of e-governance that are necessary in Hungary. The digitalisation process represents a new aspect of research, development and innovation, serving as a basis for the introduction of the latest technologies and thereby contributes to the increasing of productivity of the business sector. In terms of digital maturity, based on the EU's Digital Economy and Society Index, Hungary is below the EU average, but slightly exceeds the V3 average, preceding both Poland and Slovakia of the Visegrád countries. In the dimension of connectivity, Hungary outperforms the EU average. At the same time, in terms of the development of companies' digital competences as well as the quality and ratio of use of e-governance it is still among the last in the EU. Similar conclusion may be drawn based on IMD's Digital Competitiveness Ranking. Hungary achieved the best result in the technological environment, while it has a lag in the digitalisation of enterprises, households, and highly qualified employees.

4.114 Research and development expenditures in the economy and by sectors



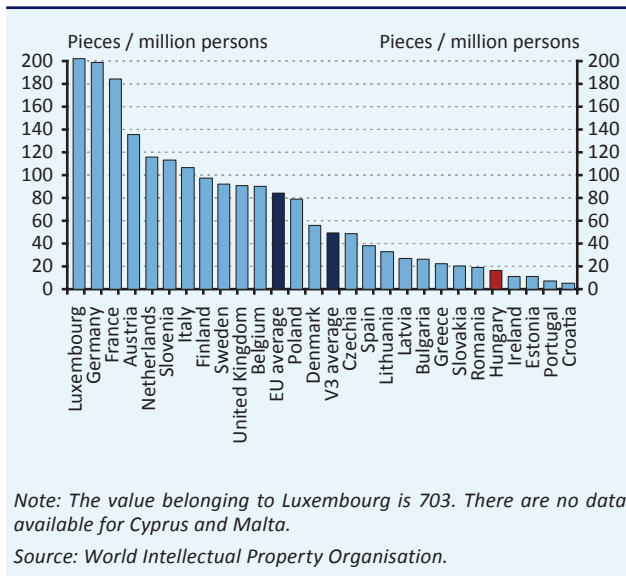
In Hungary the research and development expenditures as a percentage of GDP rose by more than one and a half times between 2008 and 2018. Thus the ratio of the R&D expenditures relative to gross domestic product (1.53 percent) is the second highest in Hungary, after Czechia, among the countries of the Central and Eastern European region. However, this falls short of the European Union’s average of 2.1 percent, the 1.8 percent target set by the government for 2020 and also of the 2.0 percent target included in the MNB’s Competitiveness Programme. The EU and Hungary need to increase their R&D expenditures by approximately 0.9 and 0.3 percentage point respectively, to reach their targets for 2020. Regarding the distribution of expenditures, in Hungary expenditures on tertiary education R&D are lower than the averages of the EU and the Visegrád region. In 2017 and 2018 the increasing Hungarian expenditures primarily resulted from the expenditures of the corporate sector.

4.115 Research and development personnel as a proportion of the labour force



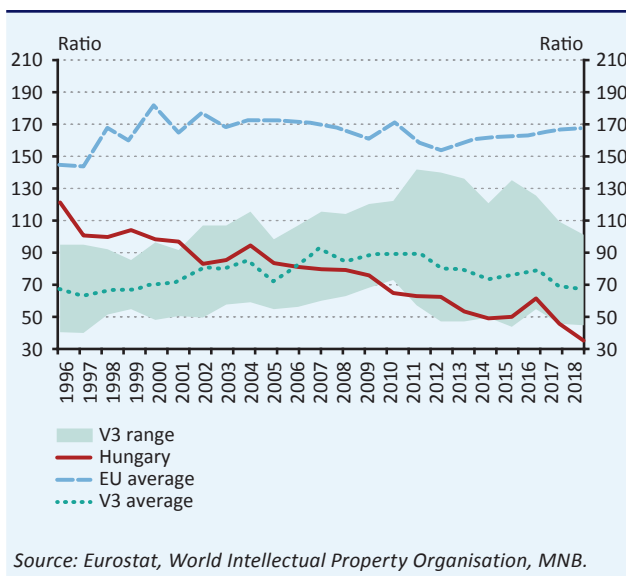
The higher number of the research and development employees supports the more efficient use of the R&D funds, thereby contributing to the boosting of productivity and to the development of knowledge-intensive industries. The ratio of the R&D employees (1-1.1 percent of all employees) in the Visegrád region and in Hungary was almost identical in 2018 and it increased at roughly the same rate between 2008 and 2018. However, the ratio does not come close to the EU average. It is positive that the Hungarian figure, which followed a declining trend between 2014 and 2016, is once again on the rise since 2017, the continuation of which may contribute to the transition to the research and innovation-driven business model.

4.116 Total patent grants (2018)



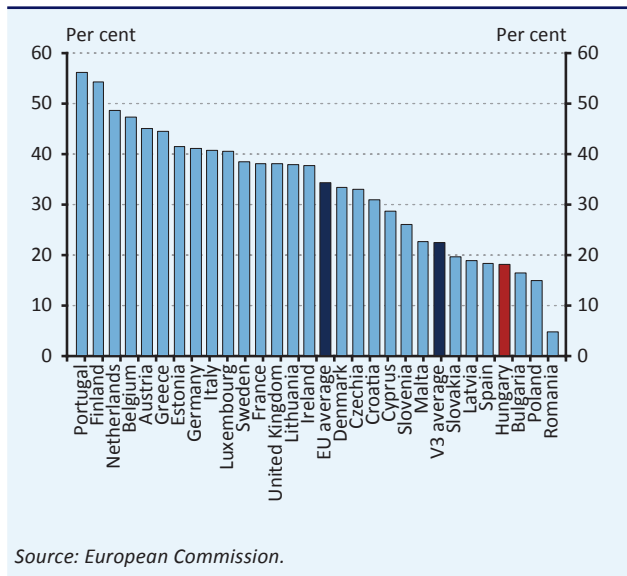
The number of patents registered in Hungary in one year is one fifth of the EU average and one third of the Visegrád average. This is partly a consequence of more active research and development activity in the Western European countries, and it is partly attributable to the fact that foreign-owned enterprises – even if they conduct basic research in Hungary – tend to apply for the new patent in their home country. In addition, in an EU comparison, the patent maintenance fee is one of the highest in Hungary, which also curbs the intensification of the patent activity.

4.117 Efficiency of R&D expenditures



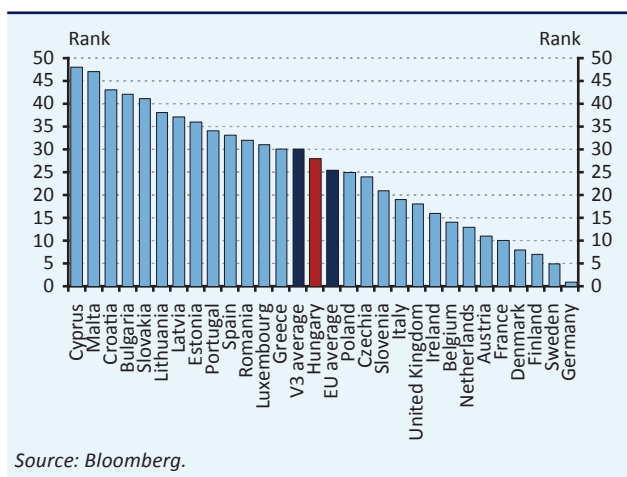
The efficiency of the research and development expenditures becomes measurable by the number of patents per one unit of R&D expenditure. The higher number of patents per one unit of research and development expenditure implies more efficient use of funding. Hungary's research efficiency lags behind the average of the other Visegrád countries since 2006. This may be attributable to the fact that the developments do not materialise in practical results, i.e. patent, and also that the foreign-owned enterprises announce the results of their development outside Hungary. Nevertheless, within the V4, expenditures spent on experimental development as a percentage of GDP (0.9 percent in 2018) is the highest in Hungary.

4.118 SMEs with product or process innovations (2017)



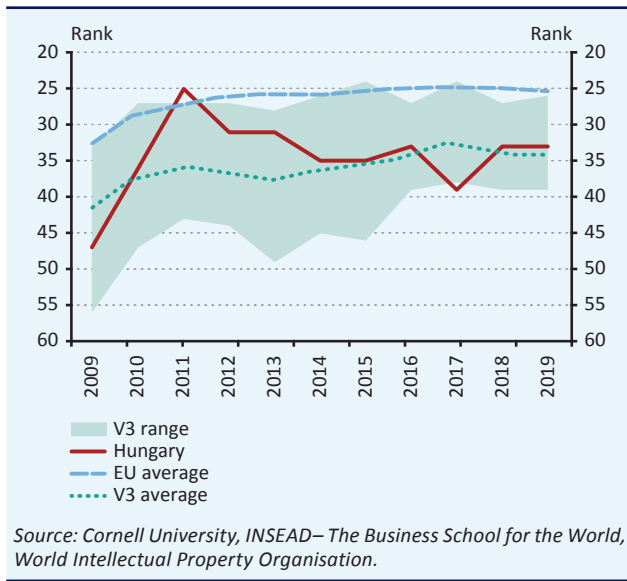
Within the Hungarian SMEs, in the period between 2008 and 2017 the share of companies presenting new products or starting new production processes was lower than both the EU level and the level for the Visegrád countries. When analysing the change of the result in time, the value of the indicator rose by three percentage points compared to 2010. However, merely 6 percent of the Hungarian companies use Big Data methods, while the EU average is almost the double of this. There is also material lag in the area of cloud technologies, enterprise resource management software, robots and 3D printing. Based on the results, the application of these technologies is unable to keep pace with the development of digital networks in Hungary and in the EU member states alike. In order to increase the value of the indicator, it is not necessary to perform basic researches and more complex developments, as it can be also increased by the practical implementation of the already existing innovative solutions in the production of enterprises. The ratio of SMEs conducting product or process innovation is one of the indicators in the European Commission’s Summary Innovation Index. In the Summary Innovation Index, Hungary is ranked 23rd among the EU Member States. The strengthening of Hungary’s research and development and innovation activity would contribute to its upgrading in the global value chains.

4.119 Bloomberg Innovation Index (2020)



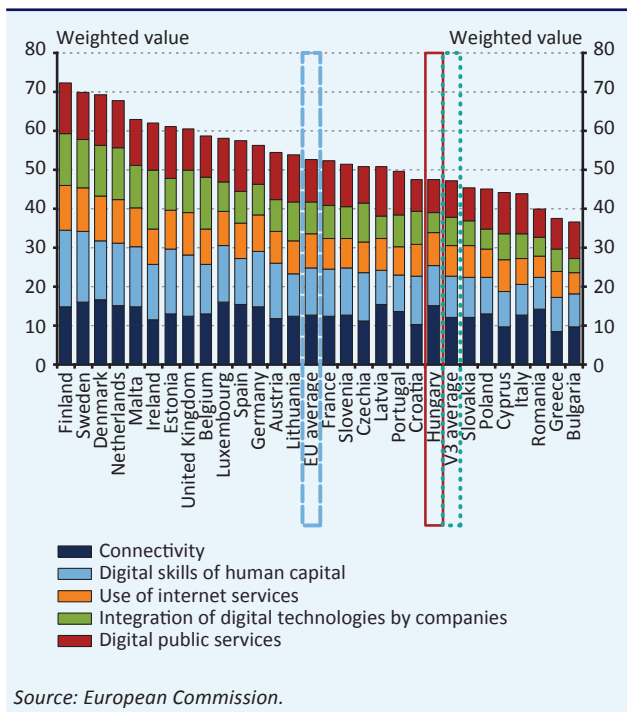
The Bloomberg Innovation Index assesses and ranks the countries’ innovation performance in seven categories based on statistical indices, and then based on results achieved in the categories it compiles an aggregate score and ranking. Hungary is ranked 28th among the 105 ranked countries. According to the Bloomberg Innovation Index, Hungary’s innovation maturity slightly exceeds that of the other Visegrád countries and lags behind the EU’s average ranking only minimally. In the areas of intensity of research and development and presence of high-tech companies, the Hungarian ranking exceeds the averages of both the EU and the region. However, in the areas of patent activity, efficiency of tertiary education and labour productivity – closely related to innovation capacity – the ranking of Hungary is below the average of the EU and the region.

4.120 Global Innovation Index



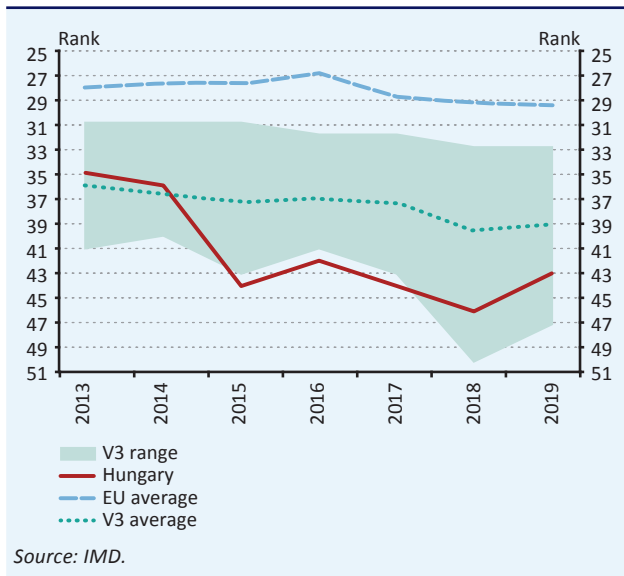
The Global Innovation Index is a composite competitiveness index measuring innovation performance and the conditions of it in 7 areas, ranking 129 countries. 70 percent of the assessed 80 indicators are objective and 30 percent of them are subjective, survey-based values or values based on other organisations' composite indicators. In addition to the innovation performance, the index also assesses the institutional environment, the quality of human capital, the business environment and the quality of infrastructure. Hungary takes the 33rd place in the ranking, preceding the average position (34th) of the other Visegrád countries and lagging behind the average of the EU by eight places (25th). Hungary achieved the best ranking (17th) in the knowledge and technological performance area, while its ranking is the worst (76th) in the sophistication of market economy operation. Hungary performs excellently in the number of enterprise researches and in the number of acquired environmental (ISO) standards. On the other hand, there is major room for improvement in increasing the number of venture capital transactions connected to the financing of innovation and in the strengthening of market competition related to innovation.

4.121 EU Digital Economy and Society Index (2020)



The Digital Economy and Society index calculated by the European Commission evaluates the digital development of EU Member States in a way that the individual components have different weights in the index: connectivity 25 percent, digital skills of human capital 25 percent, use of internet services 15 percent, integration of digital technology by companies 20 percent and digital public services 15 percent. The indicators in the index are continuously changing in parallel with technological progress. Accordingly, it was supplemented with the indicator measuring the readiness of the 5G technology. The level of Hungary's digital maturity is below the EU average, but it is almost the same as the average of the other Visegrád countries. Hungary still registers the largest lag in the digital technology and e-commerce solutions applied by companies and in digital public services. Based on this, progress is equally needed in the digitalisation of the business and public sectors.

4.122 IMD Digital Competitiveness Ranking



The IMD Digital Competitiveness Ranking measures the individual countries' digital maturity and preparedness based on 51 indicators, 60 percent of which is based on statistical data, while 40 percent is the result of questionnaire-based survey. The assessed 63 countries corresponds to the range of advanced economies analysed in the IMD's general competitiveness ranking. Both Hungary and the Visegrád region considerably lag behind the EU's average position, although Hungary's performance improved in 2019. Of the sub-categories included in the ranking Hungary performed the best in the technological environment sub-category, which is attributable to the excellent performance in 4G penetration in an international comparison and to the fast internet in Hungary. Similarly to the European Commission's Digital Economy and Society Index, based on the IMD's digital ranking as well progress is needed in the digitalisation of enterprises and households, and in the increasing of the ratio of highly qualified employees.

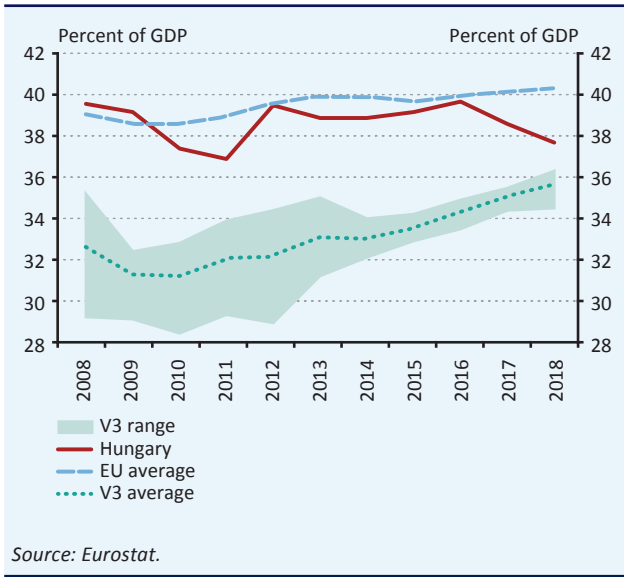
4.11 EFFICIENT GOVERNANCE

Due to its economic weight and regulatory power, the efficient functioning of the state is key to increasing competitiveness, which may be considerably supported by the extension of digitalisation in the public sector. In its capacity as the largest economic agent and regulatory body, the functioning of the state strongly influences the business environment of the national economy, which impacts the economic decisions of households and corporations as well as the competitiveness of the country. The functioning of the state is deemed efficient when it provides economic agents with optimal environment, minimising the distorting effect appearing in parallel with that. The extension of digitalisation in public administration supports this latter process. The beneficial effects of developing e-governance include, on the one hand, that public services may become simpler, faster and cheaper, which releases capacities in the private sector, and on the other hand law-abiding conduct may spread to a larger degree due to increasing trust in the general government. Although in the EU-DESI digital public services composite index Hungary is ranked 24th among the 28 Member States, in certain sub-areas the impact of the development of e-governance can be felt already; e.g. more people use e-governance over the internet than the average of the EU and the region. In Hungary, the government's public administration expenditures as a percentage of GDP still exceed the average of the European Union or the V3 group.

It signals the reduction of the shadow economy and an improvement in the general business environment in Hungary that since 2010 the rate of unpaid VAT fell drastically, from 22 to 9 percent; however, further measures are necessary for the continued reduction of the shadow economy. The conscious transformation of the tax regime contributed to the reduction of the shadow economy, as part of which the emphasis moved from labour taxes to consumption taxes. As a result of the introduction of the online cash register, the Electronic Trade and Transport Control System (EKÁER), and the online invoicing, between 2010 and 2018 the VAT gap (i.e. the difference between VAT actually collected and the potentially collectible VAT) decreased to the second largest degree among the EU Member States in Hungary, the rate of which was merely 9 percent in Hungary in 2018 (i.e. lower than the EU's average of 10 percentage points). The estimates related to the shadow economy also evidence a similar trend; however, the currently estimated, 22 percent ratio of the hidden economy in Hungary still exceeds the EU average of 17 percent.

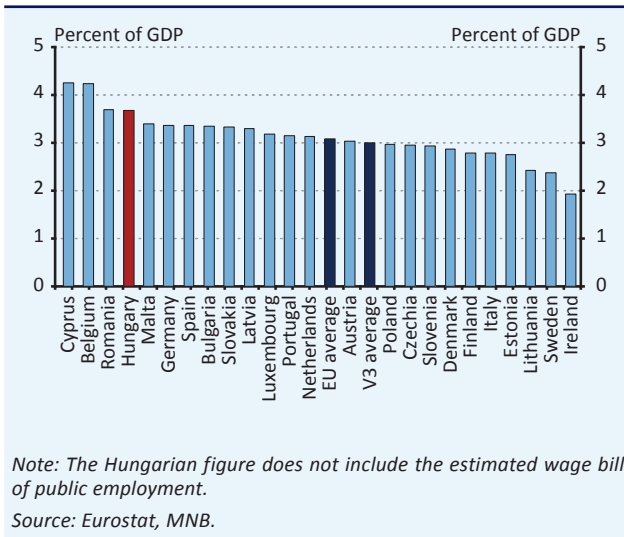
State regulations should be simplified in several areas in order to improve the competitiveness of enterprises. The number of procedures required to obtain construction permits exceeds those in the EU by one third. The time spent by companies on tax administration is rather high in Hungary; at present 277 hours per year, while the EU average is 172 hours. On the other hand, it is a plus that due to the simplification of the administration, the foundation of a company merely takes 7 working days, while the average of the EU is 13 days. The government has already recognised the challenges in this area and plans to modify the regulation within the framework of a targeted action plan, which appears in the statistics gradually.

4.123 Tax centralisation



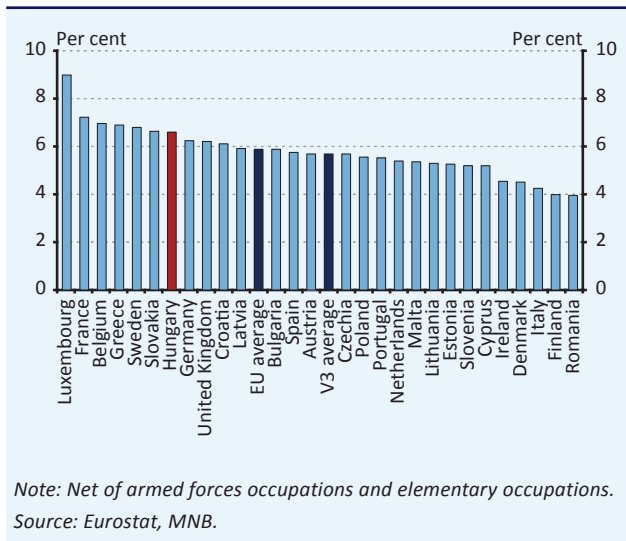
Tax centralisation shows the ratio of tax and contribution revenue as a percentage of GDP. Tax centralisation is traditionally higher in Hungary than in other countries of the region, and it tends to be at the level of the EU’s core countries. The post-2010 tax reform reduced the weight of labour taxes and increased that of the sales and consumption taxes, and reduced tax evasion. After this, tax revenues as a percentage of GDP started to follow a rising trend without increasing the tax rates. The favourable fiscal situation permitted further reduction of labour taxes through the cut of the social contribution tax rate from 2016, which was also accompanied by targeted VAT cuts. As a result, in 2018 tax centralisation declined to 37.4 percent in Hungary, while the average of the EU was 40.1 percent. From 2011, tax centralisation considerably increased in the average of the V3 countries, which signals strong convergence within the region in this respect. However, it should be noted that the level of tax centralisation alone does not provide a view of the structure and quality of the tax regime. Efficient tax regime, supporting the economy, may operate also under a high centralisation rate, and vice versa. The rate of this is often the result of social choice.

4.124 Public administration wage cost as a percentage of GDP (2018)



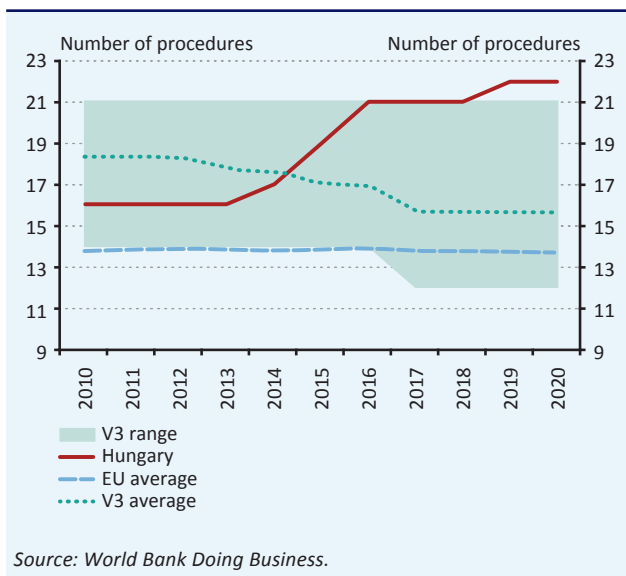
Public administration and the state’s wide ranging public services are essential for the performance of the state’s basic duties in high quality, but meanwhile attention should be also paid to cost efficiency. The higher than average level of expenditures, in an international comparison, may imply excessive bureaucracy. In 2018, wage costs for public administration as a percentage of GDP amounted to 3 percent in the V3 countries and in the EU, and to 3.6 percent in Hungary. In Hungary, public administration expenditures followed an increasing trend in the past decade, and the rate rose from 3.2 percent to 3.6 percent between 2015 and 2018. The reason for the latter was mostly the differentiated wage increase implemented in public administration, which mitigated the wage spread relative to the private sector.

4.125 Ratio of public administration employees (2019)



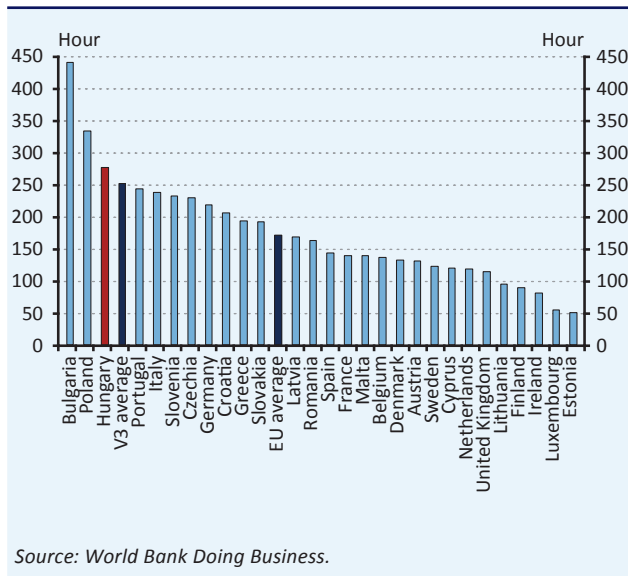
For the necessary performance of the public administration duties the state absorbs human resources from the economy. According to international comparison, in 2019 public administration employment in the narrow sense stood at 6.5 percent in Hungary, while the average of the V3 countries and the EU was 5.6 and 5.8 percent, respectively. The over-the-average Hungarian public administration employment may explain the higher cost of the operation of the bureaucracy compared to the average of the EU. In the future, in addition to the adequate level of labour force employed in public administration, the focus should move onto increased efficiency ensured by digitalisation.

4.126 Number of procedures required to obtain construction permits



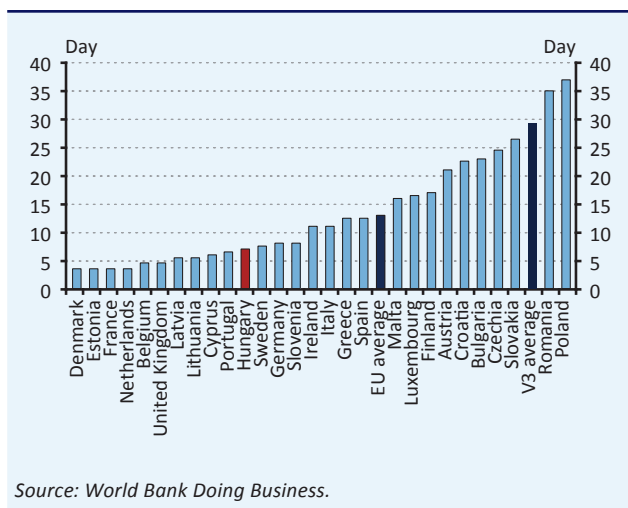
The number of procedures necessary for obtaining the construction permit shows the number of permits a company needs for starting the construction of commercial property. Based on the World Bank's latest survey, in the past ten years the number of permits increased in Hungary; at present 22 permits are necessary. In the V3 and EU countries on average 16 and 14 permits, respectively, were necessary to obtain the construction permit. The higher bureaucratic burden may impact corporations' willingness to invest negatively, and reduces the funds available for value creating activity.

4.127 Time to comply with tax filing for enterprises in one year (2019)



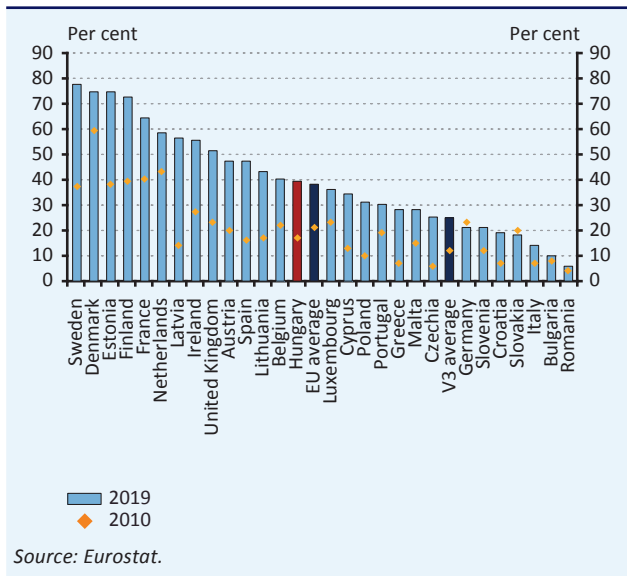
The time spent on tax administration influences the daily operation and profitability of enterprises. If they can comply with the regulations faster, they can spend more time on their own production/service activity. According to the World Bank's data, no progress has been made in this area for years in Hungary; Hungarian companies spend 277 hours per year on tax returns. Of this compliance with the social contribution tax and contributions, value added tax and corporate income tax takes 146, 96 and 35 hours, respectively. The V3 group's average of 252 hours falls close to the Hungarian value, but in order to reach the EU's average of 172 hours further measures should be taken. In the future, the time spent on tax returns is likely to be reduced by the cancellation of the supplements to the advance corporate tax and the consolidation of the employers' contributions.

4.128 Time to start a business (2019)



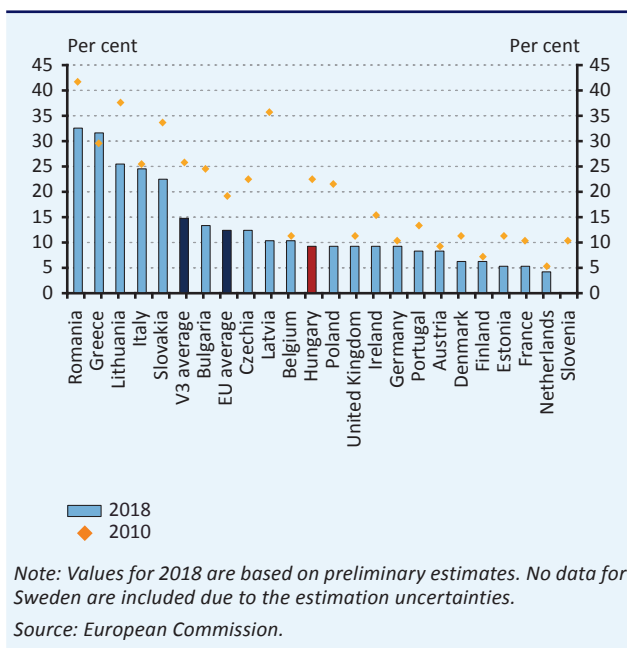
The time to start a business indicator shows how many working days are necessary to establish a limited liability company and formally start it, which may influence willingness to invest. In Hungary, it takes 7 days to obtain the necessary licences, which puts Hungary to the 11th place among the 28 EU Member States. By comparison, in the European Union and in the Visegrád countries it takes 13 and 29 days, respectively, on average to establish a company. Taken together, we may say that Hungary performs relatively well in this indicator; it takes half and one quarter of the time to start a business in Hungary than in the EU and in the V3 countries, respectively. In order to catch up with the countries that perform the best in this indicator (Denmark, Estonia, France) the time needed should be reduced from 7 to 3.5 days, which may be a realistic objective under the government's digitalisation efforts. The simplified company procedure has been available to enterprises for a long time; however, it is a major easing in the administration that the related levy and disclosure fee was cancelled from March 2017.

4.129 Public administration through the internet (2019)



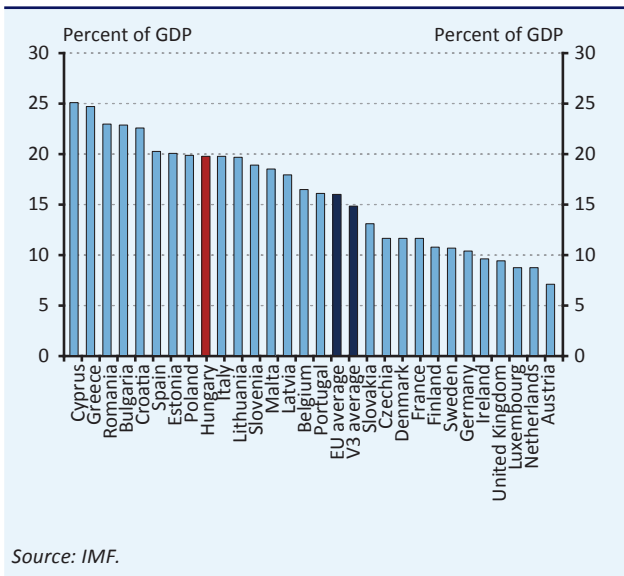
The development of e-governance contributes to the improvement in competitiveness by increasing the efficiency of public services. The public administration digitalisation efforts observed in recent years yielded a result. In Hungary online administration exceeds the average of both the region and of the EU (39 percent), while in 2010 merely 17 percent of the population used this service. However, there is still room for development, since in 2019 the ratio of forms submitted over the internet was 39 percent in Hungary, while it was 77 percent in Sweden and 74 percent in Denmark and Estonia. Opting for administration without personal presence increases competitiveness due to the smaller bureaucratic burden and releases capacity. Based on Estonia’s own estimate, the full digitalisation of public administration increased economic performance by 2 percent.

4.130 Ratio of unpaid VAT



One internationally known indicator to measure tax evasion is the VAT gap, which shows the difference between the actual VAT revenue and the theoretically collectible VAT revenue according to the estimated tax base. Since 2010, Hungary adopted several successful measures to curb tax evasion, such as the introduction of the online cash registers, Electronic Trade and Transport Control System (EKAER) and online invoicing. The efficiency of the measures is evidenced by the fact that between 2010 and 2018 the Hungarian VAT gap estimated by the European Commission decreased to the second largest degree among the countries of the EU. Accordingly, in 2018 the estimated rate of the VAT gap fell to 9 percent in Hungary, which is considerably better than the averages of the V3 and the EU at 14 and 12 percent, respectively. As a result of the positive trend, VAT revenues – under constant general tax rate and decreasing targeted VAT rates – dynamically rose. The growth of the budgetary leeway resulting from this facilitated the financing of additional economy stimulating measures.

4.131 Estimated size of the shadow economy as proportion of GDP (2017)



Due to its high social, economic and fiscal costs, combating shadow economy is a general practice in Europe. According to the latest data, in Hungary the size of the shadow economy compared to GDP is 20 percent, while the average of the EU and the region is 16 and 15 percent, respectively. In Europe as a whole, in the countries that perform the best in this indicator the estimated rate of the shadow economy is below 10 percent. Online invoicing was introduced after the latest estimation and the tax revenue data imply that it perceptibly reduced the ratio of shadow economy.

4.12 MODERN INFRASTRUCTURE AND EFFICIENT ENERGY USE

Modern infrastructure, efficient energy use and the strengthening of the green economy are key to Hungary's sustainable convergence. Modern infrastructure reduces transport costs, attracts investments that enhance the economy and facilitates the mobility of the labour force within the country. Data may become the main resource of the 21st century, the fast and safe transmission of which thus becomes a measure of competitiveness. The state has a key role in the development of a competitive infrastructure. In addition, by developing the proper energy mix and strengthening and fostering the efficiency of energy consumption, the state can reduce the country's energy dependence and may also influence the external balance of the economy favourably. The contribution of the public sector is also important in the area of green economy, in order to achieve carbon neutrality as soon as possible. The attainment of this goal can be primarily contributed to by fostering the penetration of renewable energy sources and the financial support for the corporations' environmental investments.

The density of the rail and road networks is adequate in Hungary, but the quality of those lags behind the EU average in many respects. Hungary's railway network was the sixth densest one in 2018 in the EU. However, in the railway network the ratio of high-speed, electrified and double-track sections is low, which reduces the speed, convenience and attractiveness of this type of transport. Within the public road network, the density of expressways corresponds to the average of the EU, but its length and international interconnectedness should be improved. At other parts of the public road network there are more significant quality problems with the condition of the road surface. In almost 40 percent of the counties more than half of the roads are in bad condition. City traffic is also hindered by traffic congestions. In Budapest regular drivers lose on average more than twenty minutes productive time daily due to this, and the travel time surplus compared to the traffic-free condition is the 8th highest among the EU's capitals.

The quality of the infocommunication network in Hungary is excellent; however, a major part of the Hungarian SMEs have no advanced information security solutions. The reliability of the Hungarian electricity network is also above average in an EU comparison. However, the insulation of the electricity network is outdated in many properties. In terms of the speed and penetration of broadband internet, Hungary is among the leaders in the EU. The first exceeds the average of Visegrád countries and the EU by fifty and thirty five megabits per second, respectively, while the latter is almost two and half times of the Visegrád average and almost twice the EU average. It is positive that in the sales of the 5G frequencies, being in the initial phase, Hungary's performance is the third best in the European Union, and that the Hungarian information security preparedness connected to new technological solutions exceeds the average of the EU and of the V3. However, the vast majority of the Hungarian SMEs have no advanced cyber security solution.

The energy use of the Hungarian economy and the ratio of net energy imports are still high. Although between 2010 and 2018 energy demand per unit of output declined by almost 20 percent in Hungary, the energy intensity of the V3 and Hungary exceeds the average of the EU by 80-90 percent, which also declined to a similar degree. The dynamic economic growth of recent years resulted in larger energy consumption, as a result of which the ratio of net energy imports rose by roughly 10 percentage points. In 2018, it stood at 58 percent, which exceeded the 55 percent average of the region and the almost 50 percent average of the EU. The central bank's Competitiveness Programme sets the objective to achieve a ratio below 50 percent.

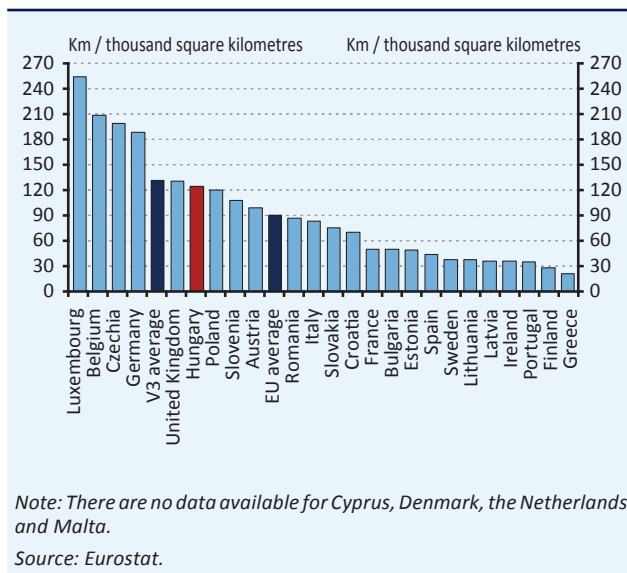
The ratio of renewable energy resources follows a declining trend in Hungary since 2014, as a result of which Hungary lags behind the EU average and has not yet reached the EU target undertaken until 2020 (13 percent). Primarily by expanding the solar and geothermal energy capacities the government would increase the ratio of renewable sources in the total energy use to 21 percent by 2030.

As a result of the regulatory interventions in the early 2010s, Hungarian energy prices – measured at purchasing power parity – declined to a moderate level for households; however for corporations it exceeds the average of the EU. In Hungary, as a result of reduction of regulated prices in several steps, between 2011 and 2014 the price of electricity for households declined first below the average of the Visegrád region, and then below the EU average. Similarly to the prices for households, electricity and gas prices for industrial use declined between 2013 and 2017, but they were unable to fall below the average of the EU. Since the prices of energy for industrial use are determined primarily through the stock exchange, by expanding the cross-border capacities that reduce energy dependency industrial energy prices may decline.

Hungary's has one of lowest carbon dioxide emission per capita in the European Union; however, the degree of air pollution is high, while the ratio of areas involved in agricultural irrigation is low. Hungary is one of those countries that in the past decades, despite their economic growth, were able to reduce their carbon dioxide emission substantially. However, contrary to the carbon dioxide emission, the exposure of the population to particulate matter pollution exceeds the average of the EU, which is also contributed to the combustion of solid fuel for heating. The reduction of air pollution would decrease the number of respiratory diseases, and thereby increase the productivity of the economy. In the past ten years major progress was achieved in the area of waste recycling, and Hungary reduced its lag compared the average of the EU. However, it is still necessary to increase the ratio of recycling. There is still room for improvement in the ratio of households connected to the sewerage and of the irrigated areas. One of the economic policy measures to reduce environmental pollution is the extension of green taxes. In Hungary revenues from environmental taxes contribute to budget revenues to a higher degree than the average of the EU, while among the Visegrád countries Hungary precedes only Czechia. The strengthening of the green economy is essential for ensuring the economy's carbon neutrality as soon as possible.

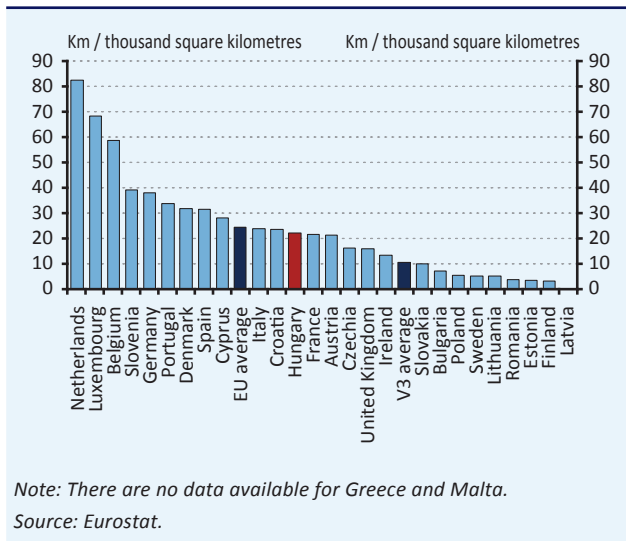
Modern infrastructure

4.132 Density of the railway network (2018)



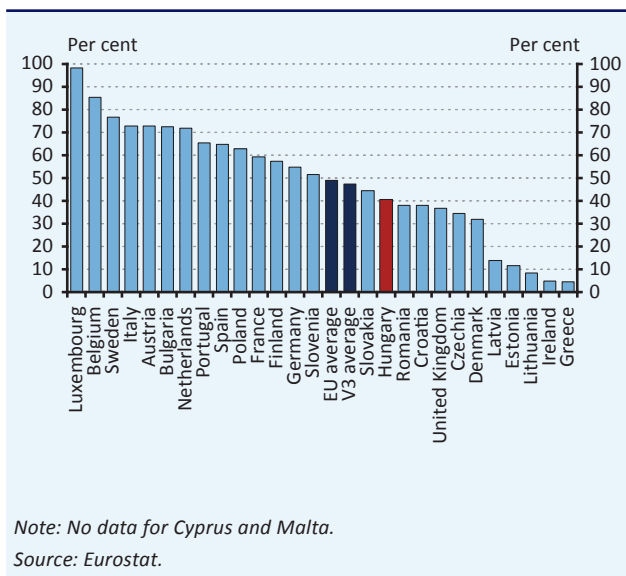
The density of the railway network is the quantitative attribute of the fixed-track infrastructure. The Hungarian railway network is the 6th densest in the European Union, outpacing – among others – the national coverage of the Austrian, French and Swedish railway network, and also exceeding the average of the EU. However, the number of railway lines represents a competitive advantage only if the quality of the tracks is suitable for fast and reliable transportation, the railway routes take into consideration – depending on their function – the location of the densely populated areas, and the infrastructure alongside the track provides convenient and attractive conditions, as a competitive alternative to road transport.

4.133 Density of the motorway network (2018)



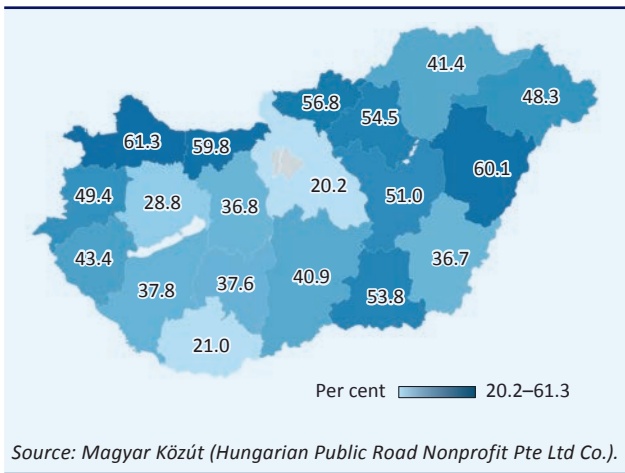
The density of the motorway network is the quantitative attribute of public road infrastructure. In Hungary motorways cover the territory of the country twice as densely as in the other Visegrád countries, but to a slightly lesser degree than the average of the EU. Since 2010 the length of motorways increased by more than 30 percent in Hungary, and at present the construction of several motorways is in progress, including in Zala County a motorway that will be suitable for autonomous cars. The purpose of the government is to ensure that the motorway network can be reached from any settlement of the country within half an hour, the towns of county rank connect to the motorway network and that the motorways reach the border. The expansion of motorways attracts investments that develop the economy and speeds up the reaching of destination by private individuals and goods.

4.134 Ratio of electrified railway lines (2018)



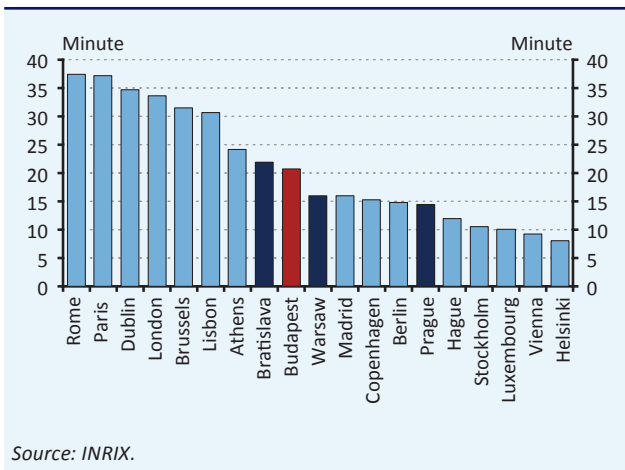
One of the qualitative criteria of the railway network, in addition to the speed, the ratio of its electrification. 39 percent of the Hungary railway is suitable for electric locomotives, which is lower than the average of the EU and the V3 by 10 and 8 percentage points, respectively. Almost three-quarters of Austria's railway lines are electrified. Electrified railway lines facilitate higher track speed, which reduces the time of transportation and getting to work, thereby making rail traffic and transportation more competitive compared to road transport, which – for the time being – causes substantially more pollution. At present only a few Hungarian railway lines are suitable for transport at a speed of 160 km/h. The growth in the number of these railway lines, and the construction of the new express lines (Budapest-Belgrade, Budapest-Cluj, Budapest-Warsaw) may facilitate in the longer run tighter connection of the large towns of the Carpathian Basin and may partially substitute the more polluting short distance flights.

4.135 Roads of substandard surface as a share of the total road network (2019)



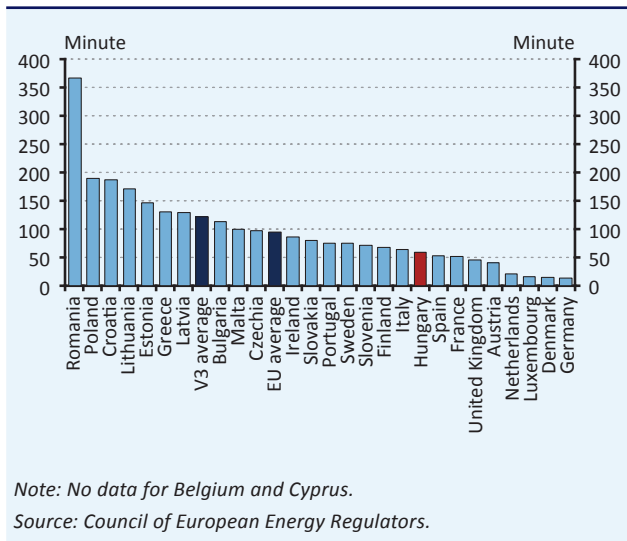
In Hungary, looking at the condition of public roads, in almost 40 percent of the counties more than half of the roads are in bad condition (as defined by Magyar Közút). Public roads of best quality can be found in Pest, Baranya and Veszprém counties. The condition of the roads is the worst in Győr-Moson-Sopron, Hajdú-Bihar and Komárom-Esztergom counties, but there are roads in all counties that need renovation. As a result of the improvement of the infrastructure and easier accessibility, it becomes easier to deliver goods to the destination, due to which access to markets improves and price competition strengthens. Better road surface may contribute to the growth in labour mobility through shorter travel time, which may also improve the productivity of the economy.

4.136 Average time lost daily in traffic congestions (2019)



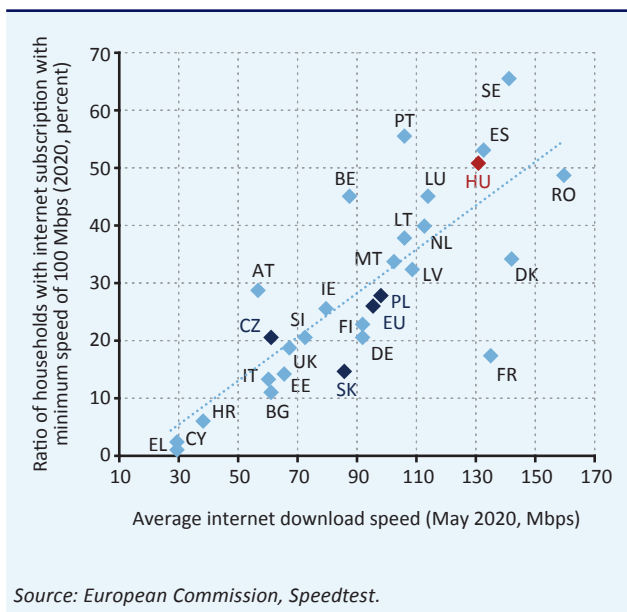
As a results of traffic congestions productive time or leisure time is lost. Regular drivers lose on average 21 minutes daily in Budapest due to the traffic jams, which may result in a loss of more than one percent of the value added generated in the capital annually. When considering only the excess time resulting from congestions during commuting between the periphery districts, conurbation and the inner city, those travelling by car lose almost twice as much time (40 minutes) daily. The average time lost in one year in traffic congestions was the 48th longest in the Hungarian capital among the 979 ranked cities in 2019, according to INRIX, a consulting company on traffic and mobility issues. Of the assessed Visegrád countries, the development of traffic congestions cause greater travel time increment than in Budapest only in Bratislava. TomTom, a company engaged in the analysis of traffic data and the manufacture of innovative traffic organisation technologies, estimates the same lost time in the case of the Hungarian capital as 40 minutes based on the 2019 data.

4.137 Length of all unplanned, lengthy electricity supply interruptions (2016)



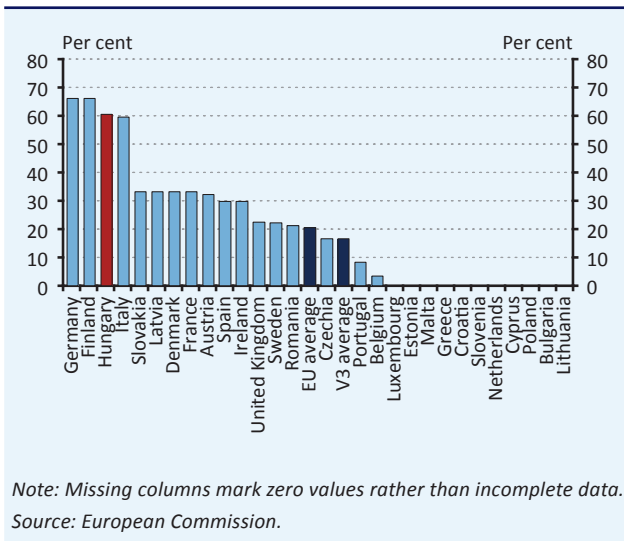
The quality of electric network can be characterised by the length of unplanned blackouts per consumer. In the Hungarian electric network the length of unplanned, lengthy supply interruptions per consumer is 59 minutes per year, which is shorter by 37 minutes than the average of the EU and by 65 minutes than the average of the V3. This result ranks the Hungarian electric network as the ninth most reliable one among the EU Member States. However, the favourable position in the ranking of unexpected blackouts is accompanied by outdated electric network insulation – particularly in the housing estates –, and the ratio of underground electric cables is one of lowest in the European Union. The enhancement of the capacity of electric networks and the further reduction of unexpected network failures may contribute to the greater penetration of the fourth industrial revolution’s new solutions.

4.138 Speed and penetration of the broadband internet (2020)



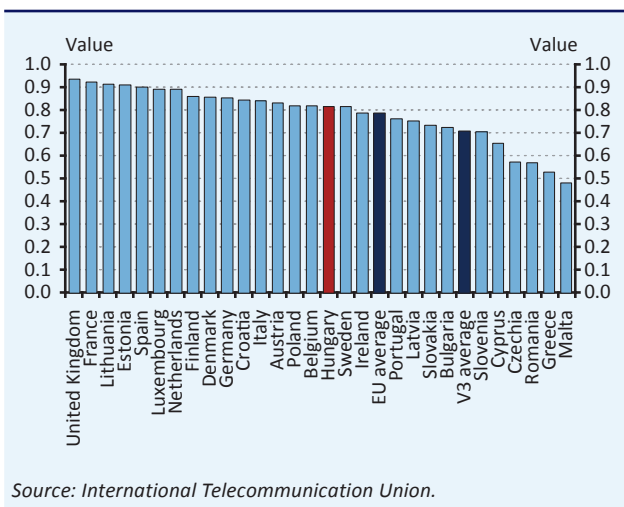
In terms of the speed and penetration of broadband internet, Hungary is among the leaders in the EU. The average download speed of the Hungarian internet is faster by 50 megabits per second compared to the other countries of the Visegrád region and by 35 megabits per second compared to the average of the EU. It is closely related to this that the ratio of households with subscription for internet with minimum speed of 100 megabit per second reaches 50 percent in Hungary, which exceeds the average of the other Visegrád countries by 30 percentage points and of the EU by 25 percentage points. The fast domestic internet, which is widely spread among the Hungarian households, facilitates, among other things, the penetration of digital solutions to households, the use of e-governance solutions and the rise in their usage rate. The fast internet also supports enterprises in their production and services activity, thereby increasing their competitiveness in the international market.

4.139 5G mobile internet readiness (2020)



The readiness of the 5G mobile internet shows the ratio of a country’s 5G-capable frequencies licensed and taken into use by the service providers until the end of 2020. Hungary is ranked third in the European Union in this indicator, since contrary to several EU countries – including the Netherlands and Luxembourg – the sale of 5G-capable frequencies is already in progress. Furthermore, by the end of 2020 the technology will be able to operate on 60 percent of the entire volume of eligible frequencies. The 5G technology fosters the penetration of the Internet of Things (IoT) among enterprises, which may substantially increase productivity, and thus it is important for Hungary to preserve its advantage during the configuration of the technology. It is a competitive advantage for Hungary that the 4G mobile internet service is available in almost 97 percent of the country, while in Germany (94 percent) and Slovakia (89 percent) there are several blind spots in the service.

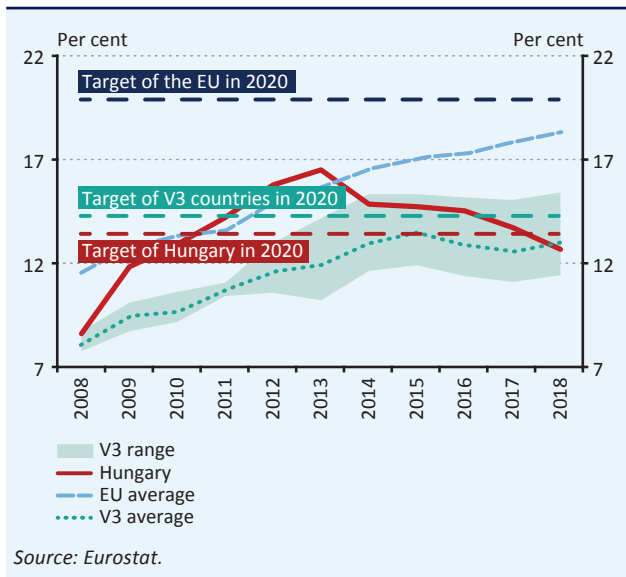
4.140 Global Cyber Security Index (2018)



The operation of modern telecommunication infrastructure calls for secure environment. The Global Cyber Security Index of the International Telecommunication Union measures the robustness of this secure environment. This is a composite index comprising of 25 indicators, where the best score is 1 and the worst one is 0. Hungary’s cyber security exceeds the average of the other Visegrád countries and, to a smaller degree, also the average of the EU, but lags behind the developed Northern and Western European countries. 80 percent of the Hungarian companies have no advanced information security solution and the malware bot attacks are the most frequent in Hungary within the EU. By establishing the National Cyber Security Institution the institutional scheme guaranteeing the information security of the general government and local government bodies has been centralised. However, through the improvement of the Hungarian information security software sector Hungary would be able to rely on its own knowledge in this area.

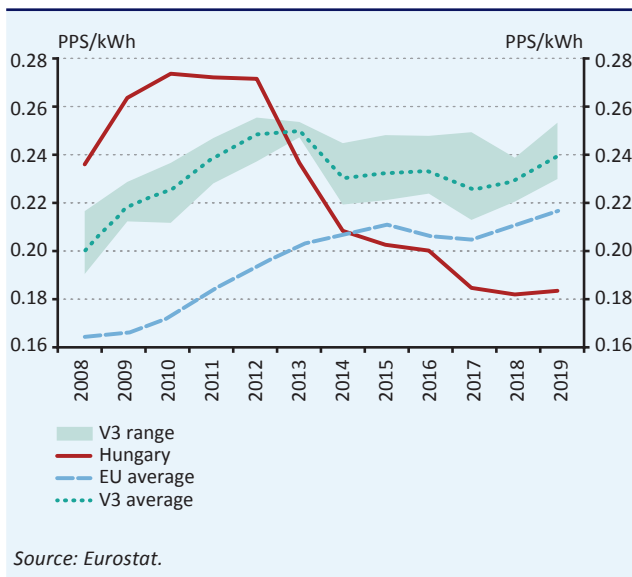
Efficient energy use

4.141 Use of renewable energy sources



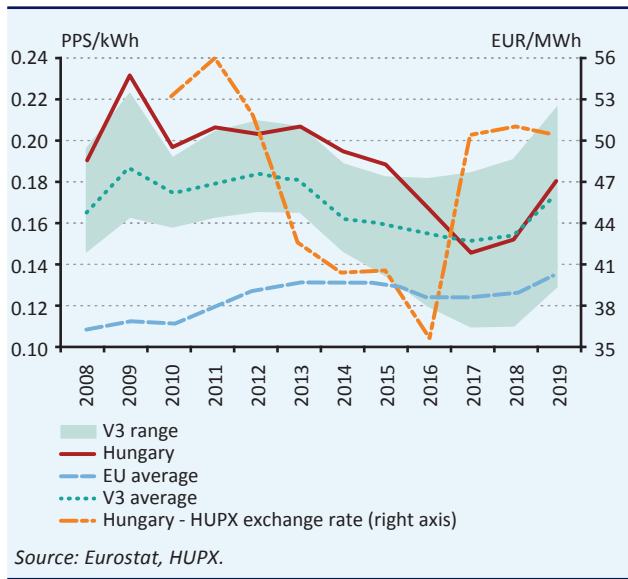
The use of renewable energy sources as percentage of total energy consumption corresponds to the average of the Visegrád countries, but it is below the average of the EU. Hungary has already fulfilled the target value undertaken for 2020 before, but in 2018 the use of renewable source fell below it. However, the decline is partly stems from a favourable trend, because as gas heating became cheaper – as a result of the utility cost reduction – the use of firewood, regarded as renewable, decreased. The installed solar energy capacity reached 1,000 MW by 2019 from 35 MW registered in 2013, and the objective of the government is to increase this value to 6,000 MW by 2030. In addition to the expansion of the solar energy capacities, the energy policy is built on the use of non-firewood based biomass and the exploitation of geothermal energy, which would increase the share of renewable sources to 21 percent by 2030.

4.142 Electricity price (for households)



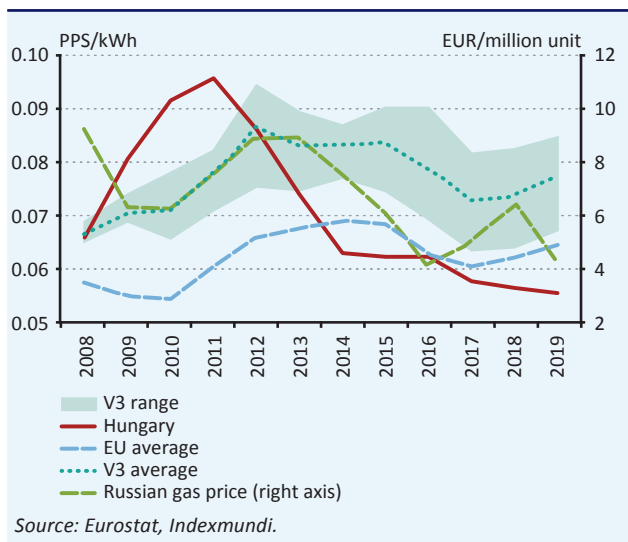
In the period between 2012 and 2014, as a result of the reduction in regulated prices in several steps, the price of electricity (for households, including taxes and other levies, calculated at purchasing power parity) in Hungary fell below the average of the Visegrád region, and since 2015 it was even lower than the EU average. The decline compared to 2010 amounted to more than 30 percent. The price of the Hungarian household electric energy (including taxes and other levies) amounted to EUR 0.11 / kWh since 2015. Based on the comparison of international prices by the Hungarian Energy and Public Utility Regulatory Authority, the price of household electricity measured at purchasing power parity at the beginning of 2020 was the eighth lowest one in Budapest among the capitals of the EU. A modelled household with two wage-earners spend 3.4 percent of its income on energy expenses, which puts Hungary in the middle range of the EU.

4.143 Electricity price (for industrial consumers)



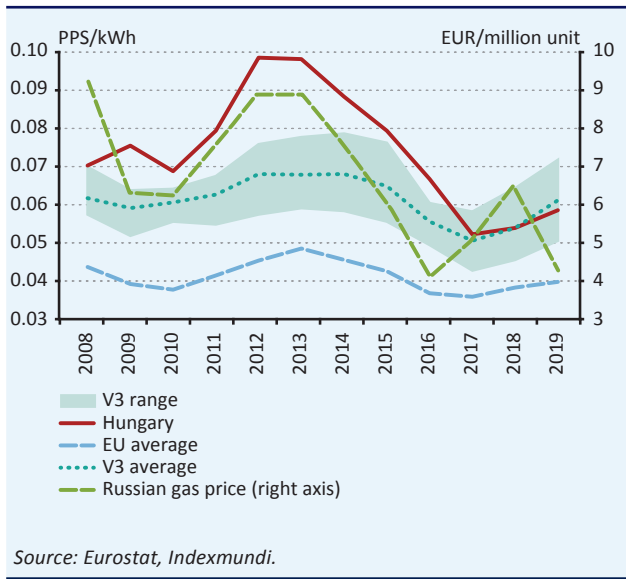
While for households the electricity is provided in the form of universal service, in the case of companies the free market supply results in more diversified electricity prices. How favourable electricity price conditions a company can access also depends greatly on a company’s individual management abilities (and individual trading structure). Between 2013 and 2017, the Hungarian industrial electricity prices (with taxes and other levies at purchasing power parity) declined to the average price level of the other Visegrád countries, but they are still higher than the EU average. In 2019, the price of Hungarian electric energy for industrial use (including taxes and other levies) amounted to EUR 0.12 / kWh. In addition, HUPX, i.e. the Hungarian Power Exchange, which determines the daily price of industrial electricity trading on a demand and supply basis, operates since 2010. The scarcity of the cross-border electricity capacities towards Austria and Slovakia limits the import of cheaper electricity, as a result of which the Hungarian stock exchange electricity price level has been higher for several years than in the neighbouring countries. A further decline in industrial electricity prices would be important in order to allow the fixed costs of companies to remain at low levels in Hungary over the long term as well.

4.144 Gas price (for households)



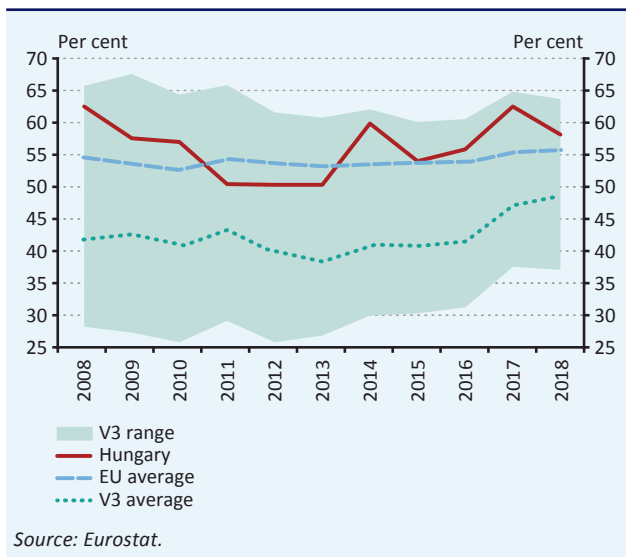
Due to the reduction of regulated prices, the price of gas for households (including taxes and other burdens, at purchasing power parity) in Hungary declined by 34 percent in multiple steps between 2011 and 2014. Due to this the gas price for households fell below the Visegrád and the EU average from 2013 and 2014, respectively. In 2019, the price of 1 kWh of gas for households (including taxes and other levies) costs EUR 0.03. Based on the comparison of international prices by the Hungarian Energy and Public Utility Regulatory Authority, the price of natural gas for household consumers in Budapest measured at purchasing power parity at the beginning of 2020 was the fifth lowest one among the capitals of the EU. The low level of household gas prices increases the consumption of other goods or the savings of households and, through that, economic competitiveness as well; for this reason is it important to give consideration to the possibility of decreasing regulated energy prices further depending on the change in the world market prices.

4.145 Gas price (for industrial consumers)



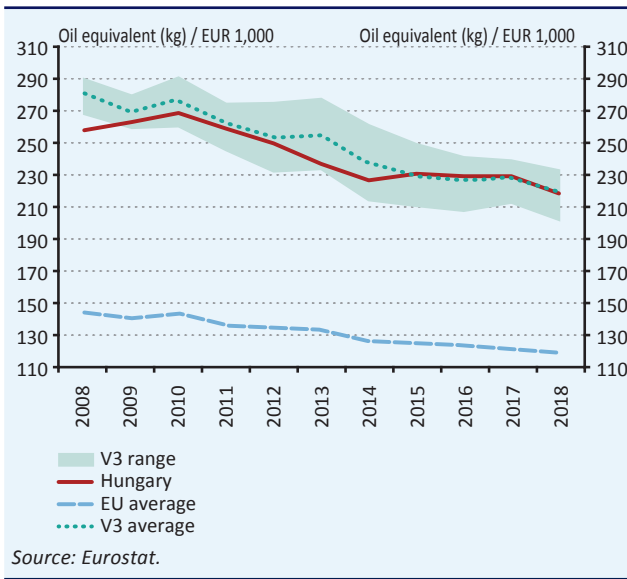
Similarly to household gas prices, as a result of global market trends, the gas prices for industrial – i.e. corporate – consumers (including taxes and other levies, at purchasing power parity) declined between 2013 and 2017 in Hungary, and reached the average price level of the Visegrád region, but they still lag behind the average of the EU, albeit to a lesser degree than in previous years. In 2019, the price of 1 kWh of gas for industrial consumers was EUR 0.04 (including taxes and other levies). Between 2013 and 2017, the Hungarian price materially declined, as a result of the fall in world market prices. Since the world market price of natural gas continuously changes, the reduction of dependency on Russian gas may contribute to the maintenance of lower energy prices in Hungary. This may be supported by increasing the number of natural gas import routes, by developing the cross-border gas network connections suitable for two-way transportation between Hungary and Romania, Hungary and Serbia, Hungary and Croatia, and Hungary, Slovenia and Italy.

4.146 Net energy imports



Net energy imports as a percentage of total energy use is the measure of the countries' energy dependency. The rate of Hungarian energy imports is approximately 60 percent, which exceeds the average of the other Visegrád countries by 10 percentage points and the EU average by somewhat less. In Hungary, the ratio of energy imports declined during the crisis (2009-2013), since the total energy consumption fell; however, in parallel with the acceleration of economic growth, the ratio of net energy imports rose by roughly 10 percentage points due to the rising energy needs. The objective set in the central bank's Competitiveness Programme is to reduce net energy imports below 50 percent by 2030, which may be achieved, in addition to strengthening energy efficiency, by increasing the domestic production capacities. With a decline in net energy imports, a country's energy dependency also declines, resulting in an improvement in the given country's economic independence and competitiveness. A further reduction of the energy dependency would improve the energy security of Hungary.

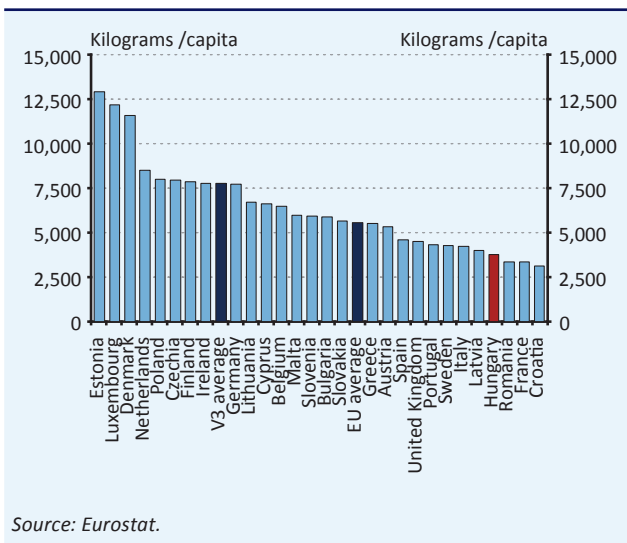
4.147 Energy intensity of the economy



The energy intensity of the economy shows the amount of energy consumption per one unit of economic output. Hungary's energy intensity move closely together with the average of the region. The energy intensity of Hungary and the Visegrád region is still about double the average of the EU. Lower energy intensity is cheaper for the operation of the economy, and in addition to increasing efficiency, it provides more environment-friendly conditions for successful convergence over the long term.

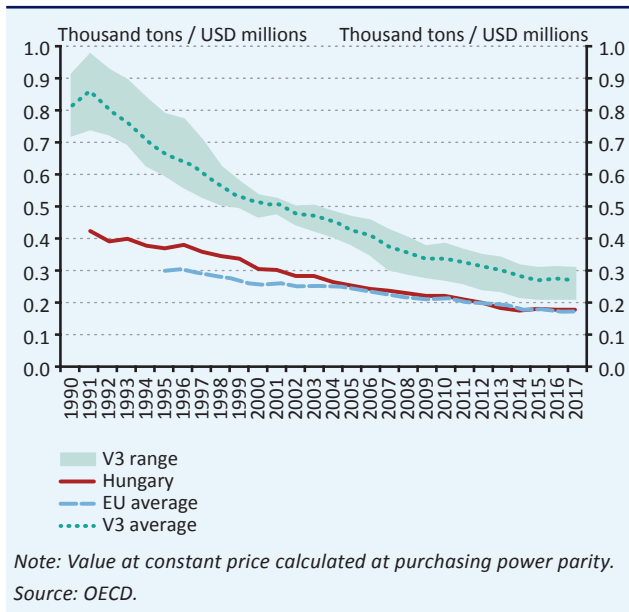
Green economy

4.147 Carbon dioxide emission per capita (2018)



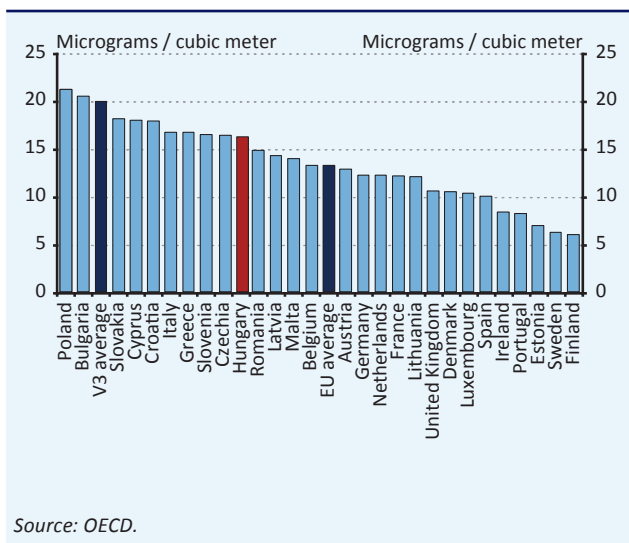
Hungary is one of the relatively few countries that substantially reduced their carbon dioxide emission in the past decades under expanding economic performance. Hungary is among the leaders in terms of reducing carbon dioxide emission per capita; it is preceded only by Croatia, France and Romania in the EU. Due to this, the Hungarian figure is considerably below the averages of the European Union and the V3 countries, although in recent years it moderately increased due to the fast economic growth. By 2050 – subject to the availability of adequate financial resources – it may be a realistic objective to convert the economy gradually to become carbon neutral. This would facilitate not only the protection of the environment, but also the penetration of new technologies and industries representing higher value added, thereby contributing to sustainable convergence.

4.149 Carbon dioxide emission per one unit of economic output



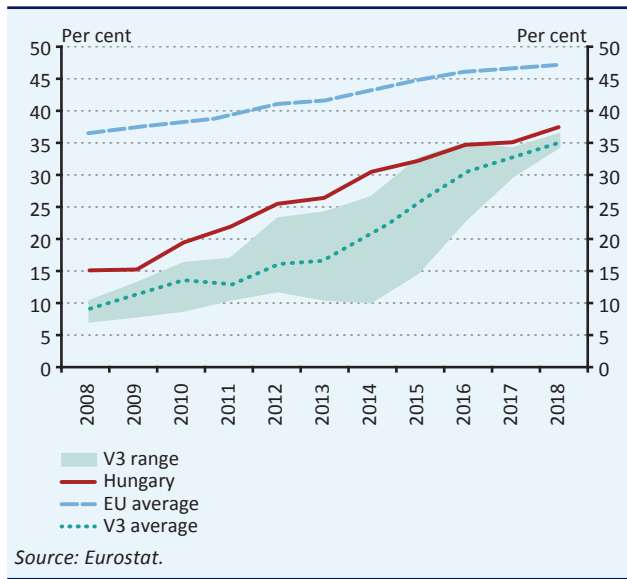
In Hungary, the carbon dioxide emission per one unit of economic output is around the EU average, but it is lower than in the other Visegrád countries. It is primarily the Czech and Polish economies that produce under extremely high emission values. On the other hand, Sweden – leading the EU ranking – emits less than half of the volume of carbon dioxide as Hungary. In recent years, economic output rose faster than the carbon dioxide emission per one unit of product decreased, and thus Hungary’s total CO₂ emission increased. As a result of the changeover to the intensive growth model, the economy would be able to achieve sustainable high growth under low emission.

4.150 Exposure of the population to air pollution (2017)



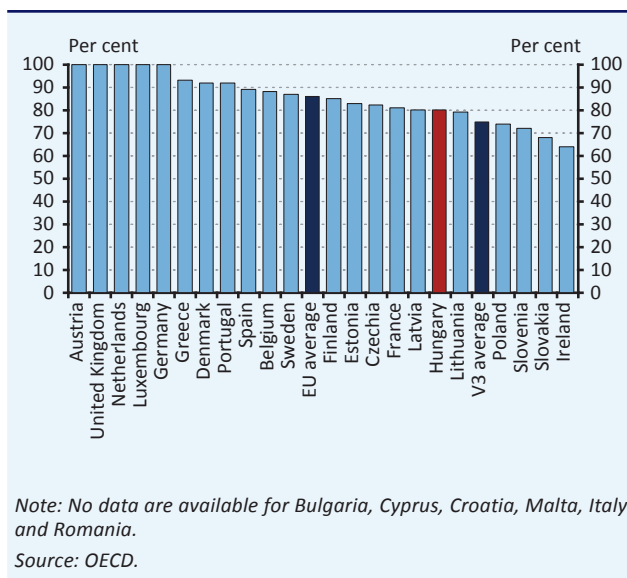
The exposure of the population to air pollution stemming from particulate emission in Hungary exceeds the average of the EU. At present, Hungary has the ten highest average concentration ratio of air pollutants smaller than 2.5 microns per cubic metre (16 micrograms / cubic metre). The inhaled pollutants smaller than 2.5 microns are not emptied from the lungs, and thus exposure to those for a long time represents severe risk to health. Due to the deteriorating health of the labour force, higher air pollution has negative impact on the economic productivity as well. In Hungary the particulates emission exceeds the benchmark value specified by the World Health Organisation by more than one and half times. The main source of air pollution is the use of solid fuels for the heating of residential properties, and thus pollution could be reduced by curbing that.

4.151 Recycling rate of municipal waste



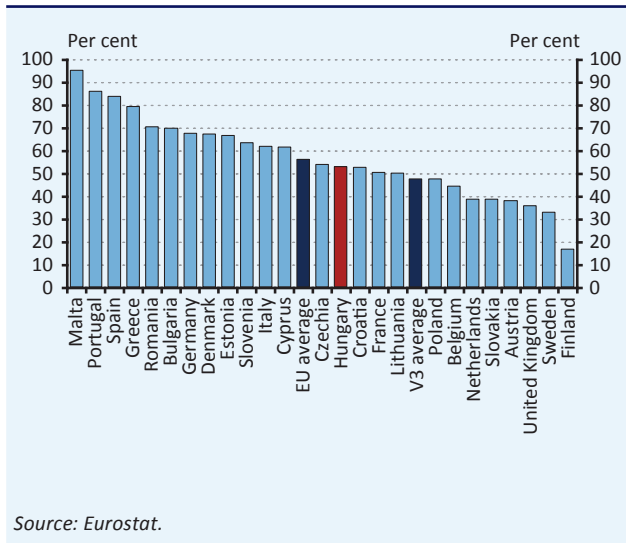
Waste management plays an important role in the efficient utilisation of resources and in the reduction of resource intensity. In the past years major improvement was achieved in the area of recycling or reprocessing of municipal waste. Hungary managed to reduce its lag compared to the EU average to less than half, at the same time maintaining its leading position among the Visegrád countries. By increasing the present recycling ratio of 37 percent further, the wasting of resources can be prevented, harmful environmental impacts can be reduced and demand for primary natural assets may be decreased.

4.152 Connection to the sewerage network (2018)



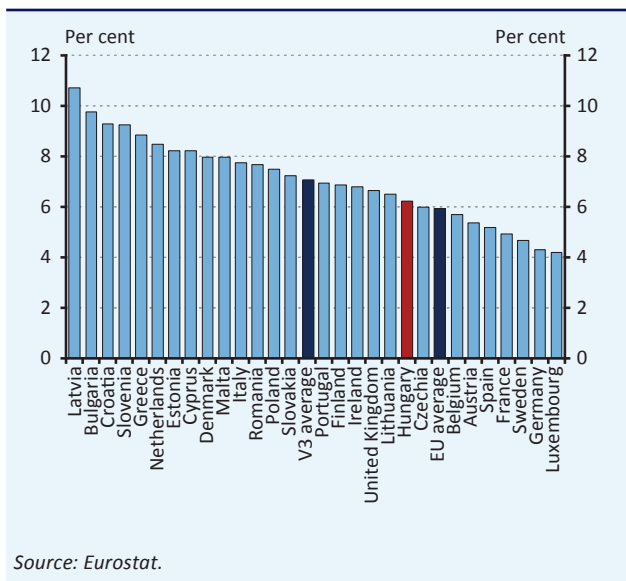
In Hungary, 80 percent of the households are connected to the sewerage system, which represents a progress compared to 70 percent registered in 2010, but it is below the EU average by 6 percentage points. In Hungary the ratio of households connected to the sewerage network exceeds the average of the other Visegrád countries by 5 percentage points; however, part of the developed Western European countries have a connection ratio of minimum 90 percent. Of the countries assessed by OECD, the ranking is led by Germany, the United Kingdom, Austria, the Netherlands and Luxembourg. In Hungary the development of sewage disposal is inadequate primarily in the settlements with inhabitants fewer than 2,000.

4.153 Share of irrigated areas (2016)



In Hungary, roughly half of the areas suitable for irrigation is effectively irrigated, which is roughly the same as the average of the EU and the other Visegrád countries. Considering that the ratio of cultivation, directly exposed to weather conditions, is around 60 percent, this is below the optimal value. It is particularly important to prepare agriculture for the impacts of the climate change, which affects the Carpathian Basin as well to an increasing degree. Increasing the ratio of irrigated areas and the efficient use of the available water resources would considerably increase the agricultural sector’s productivity and reactivity to the impacts of the climate change.

4.154 Revenues from environmental tax as a percentage of the total tax revenue (2018)



In Hungary revenues from environmental taxes contribute to the total general government tax revenues to a higher degree than the average of the EU, while among the Visegrád countries Hungary precedes only Czechia. The Hungarian ratio exceeds the average of the EU, which is reduced by such large economies as Germany, France and Spain. Within ‘green taxes’ the Eurostat differentiates four categories. Of these the revenues from energy taxes are the highest, followed by tax revenue from transport. The first accounts for roughly three quarters of the green tax revenues, while the latter for one-fifth of them. The revenues from taxes imposed on environmental burden and the resource taxes together account only for a fraction of green tax revenues. However, in Hungary the revenues from environmental burden taxes exceed the average, accounting for almost 10 percent of green taxes as a result of the revenues from the charges on substances emitted into the air, water and soil. The purpose of these tax types is to make the economy’s largest polluters pay for the use of public property, such as clean air and water.

Albert Szent-Györgyi

(Budapest, 16 September 1893 – Woods Hole, Massachusetts, 22 October 1986)

Albert Szent-Györgyi, Nobel Prize winner Hungarian physician, biochemist.

Between 1904 and 1911 he attended the Presbyterian Secondary Grammar School in Lónyay Street, then continued his studies at the Medical Faculty of the Budapest University. He participated in World War I as a medical officer on the Eastern Front. Risking his life, he helped to rescue the wounded, for which he received the Silver Medal for Valour. After World War I he continued his studies in Bratislava, Prague, Berlin, Leiden and Groningen in the fields of biology, physiology, pharmacology, bacteriology and then physics and chemistry.

During his studies, he identified a new material in the adrenal of animals; later he succeeded in extracting the same material from cabbage and orange. The material with the molecular formula $C_6H_8O_6$ was named hexuron acid. In 1927 he defended his doctoral thesis written about discovering the hexuron acid at Cambridge University, and became a doctor of chemical sciences.

On 1 October 1928 he was appointed to professor of Szeged University, where he started his research and teaching activities as a professor of the medical chemical institute in 1931. As of 1931, he dealt with the research of vitamin C, whose exact composition was still unknown. However, Szent-Györgyi proved that the hexuron acid found in the adrenal and vitamin C is the same material. Following that, he succeeded in producing significant quantity of vitamin C from green pepper. His further researches covered, inter alia, biological oxidation, the examination of certain parts of the citrate cycle, which was not completely known at that time, and the exploration of the protein chemical background of mechanical muscular movement.

In 1937 he received the Nobel Prize in Physiology or Medicine for his research related to vitamin C, 'for his discoveries in connection with the biological combustion processes, with special reference to vitamin C and the catalysis of fumaric acid'. He offered the medal he received with the Nobel Prize to those who suffered from the Finnish war that broke out at that time. Later this medal was bought by Wilhelm Hilbert, a company director in Helsinki, who, in 1940, presented it to the Hungarian National Museum, where it is still preserved. In 1938 he became a member of the Hungarian Academy of Sciences.

In 1947 he left the country, and settled in Woods Hole, near Boston, where first he was the director of the Marine Biological Laboratory, then a professor of Dartmouth College. He devoted the last two decades of his life to cancer research. His important observation was the realisation of the role of free radicals in the development of cancer and the realisation of the radical catching role of vitamins (such as vitamin C). In 1972 he founded the National Cancer Research Foundation. In the 1960s he started to deal with politics as well. He wrote numerous articles in which he criticised the nuclear arms race, and in 1970 he also protested against the Vietnam War. In 1978 he was a member of the delegation that brought the crown jewels back to Hungary.

Albert Szent-Györgyi remained mentally and physically fit in his old age as well. He died in his home due to renal insufficiency on 22 October 1986. He was buried in the garden of his house on the shore of the Atlantic Ocean.

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