MAGYAR NEMZETI BANK

GROWTH REPORT

2018

'The true power of a nation is the number of scientifically educated citizens.'

Hitel (Credit) 178.
Count István Széchenyi

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Pursuant to Act CXXXIX of 2013 on the Magyar Nemzeti Bank, the primary objective of Hungary's central bank is to achieve and maintain price stability. Low inflation ensures higher long-term economic growth and a more predictable economic environment, and moderates the cyclical fluctuations that impact both households and companies. Without prejudice to its primary objective, the MNB supports the maintenance of the stability of the financial intermediary system, the enhancement of its resilience and its sustainable contribution to economic growth; furthermore, the MNB supports the economic policy of the government using the instruments at its disposal.

The growth trends of the economy may influence, both directly and indirectly, the ability of monetary policy to achieve the objectives set out in the MNB Act and consequently the conduct of monetary policy. Changes in the dynamics and structure of economic growth may determine the evolution of short-run inflation trends, while the longer-term growth potential and its factors can have a fundamental impact on the assessment of the financial stability of the economy. With that in mind, in the future the Magyar Nemzeti Bank will provide an annual overview of the most important trends shaping economic growth over the short, medium and longer term, presenting its assessments to members of the profession at home and abroad in its Growth Report.

The analyses in this Report were prepared under the direction of Barnabás Virág, Executive Director of the Executive Directorate Monetary Policy and Economic Analysis. The Report was prepared by staff at the MNB's Directorate Economic Forecast and Analysis, Directorate Monetary Policy and Financial Market Analysis, Directorate for Fiscal and Competitiveness Analysis and Directorate Financial System Analysis, and at the Macroprudential Policy Department. The Report was approved for publication by Dr György Matolcsy, Governor. The Report also incorporates valuable input from other areas of the MNB.

Content

Summary of key findings

After 2010, Hungary progressed through a successful stabilisation period. Starting from 2013, the fiscal reforms and monetary policy turnaround once again set the Hungarian economy on the path of convergence. The new model was characterised by rising employment, a reform of the tax system, the recovery of macro financial balance and a monetary policy, which also supported the economy with new, innovative instruments. As a result of these historic turnarounds in economic policy, the economic development of Hungary continuously approached the level of Western European countries, while maintaining macroeconomic equilibrium.

The purpose of the 2018 Growth Report of the Magyar Nemzeti Bank is to identify a consistent macroeconomic path that ensures the sustainable convergence of the Hungarian economy. A country's long-term growth is not determined in advance. In the case of fast-growing economies, the additional economic growth compared to the advanced regions usually runs out of steam before they catch up with the advanced economies. This phenomenon is referred to in the economic literature as the middle-income trap. Some economies have been able to successfully break out of the middle-income trap. The countries that implement successful convergence are rather heterogeneous and different in terms culture and geographical location as well. At the same time, the continuous enhancement of productivity, application of advanced technology and operation with high economic efficiency are observed in the case of all such successful converging economies. It is an important experience in economic history that convergence with developed countries usually takes place in conjunction with a growing population. Accordingly, Hungary also faces a dual challenge: in addition to achieving a demographic turnaround, the labour-intensive growth observed in recent years should be replaced by an increasingly capital- and knowledge-intensive growth model, while at the same time maintaining full employment.

In our analysis, we present a macroeconomic path which shows the way out from the status of a middle-income country and generates a major increase in prosperity by 2030. In our Report – building on the economic lessons learnt in the last decades – we present the required changes in supply-related factors, in aggregate demand, in income distribution and in the financing sector. We present the positive feedback mechanisms, on the basis of which over the next 10 years Hungary will reach 80 percent of Austria's GDP per capita, calculated at purchasing power parity, from the present 55 percent. The key drivers behind maintaining organic economic growth include a substantial rise in capital intensity and productivity, maintaining full employment and a robust increase in real wages. All of this can occur along an equilibrium path: the current account remains steadily positive, full fiscal balance is feasible and the government debt-to-GDP ratio declines significantly.

However, a comprehensive and continuous improvement in competitiveness is needed to continue Hungary's convergence in a sustainable manner over the longer run and in a changing global economic environment. It is not possible to exit the status of middle-income country with small steps, as comprehensive measures are needed. In the case of Hungary, this means competitiveness reforms in the coming period.

The basis for a successful turnaround in competitiveness is a comprehensive analysis of the megatrends shaping the global economy, which represent points of entry for Hungary as well. The rise in the world's population and population ageing, the expansion of the global middle class and rapid urbanisation may rearrange income and consumption patterns. Hungary and the Visegrád region lie along the transit route between the developed region of Western Europe and the swiftly developing Asian market, which offers excellent opportunities for both traditional service sectors (tourism, transportation) and modern ones. The world has entered a new technological cycle. The new, breakthrough technologies may reshape the structure of economic production and labour markets. The shift to production and services of higher value added is conditional upon participation in innovation, the application of new technological accomplishments and solutions, and the modern physical and digital infrastructure. As a result of the wide-ranging penetration of the internet, nowadays services take place in the global space and are no longer tied to a geographic location. The spread of digital platforms and changing consumer trends may provide points of entry for SMEs. The issues of sustainability and energy efficiency are essential to analysing the challenges of the next decades. Identifying the trends and capitalising on the opportunities inherent in the changing global energy mix are critical for Hungary as well.

One of the most important factors in economic growth, convergence and competitiveness is human capital, which also affects the performance of the national economy through its quantity and quality. Over the long run, the volume of the available workforce is essentially determined by demographic trends. In the case of Hungary, if no additional measures are taken, after 2020 the demographic barriers to growth will become increasingly effective. For this very reason, it is important to provide further support for a demographic turnaround to ensure that over the long run sufficient volume of labour is available to support the rise in the economy's value-creating capacity. However, the demographic turnaround will only have a positive effect on the labour market over the longer run. On a horizon of 10–12 years, which is the focus of our analysis, growth in the employment rate along the macroeconomic path including the reforms may be assisted by the return of the citizens working abroad and the flow of the economically inactive to employment. In addition, we anticipate major flows from public administration and the public work scheme to the private sector. The health conditions of the Hungarian population are below the average in international comparison and thus a significant labour market reserve can be found here as well. The implementation of reforms aimed at improving the population's state of health could significantly contribute to increasing the quantity and quality of the available workforce.

Improving the level of employees' skills and qualifications may also have a strong positive impact on economic growth. The rise in the ratio of those holding a higher education degree exerts positive impact on the wealth of individuals participating in education and on social welfare. At the macroeconomic level, expenditures on (public) education basically only pay off over the long term; the achievement of short-term results requires further strengthening of adult education and the system of advanced training. The earnings and employment rate of employees with a higher level of education exceed the corresponding data of those with a lower level of education. Consequently, it is expedient to increase the ratio of degree holders, especially in the area of sciences. The main challenge 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. It would also be progressive if the attitude spread in Hungarian society that it is only possible to meet the challenges of the modern era with the help of continuous (self-)development. In the future, in addition to providing basic encyclopaedic knowledge, the education system should primarily focus on the acquisition of adequate basic skills (including the English language and IT skills), and students should be outfitted with the ambition and ability to continuously learn.

One of the key elements in breaking out of the middle-income trap is to boost the productivity of the corporate sector. The first question is which group of businesses is expected to make major contribution to economic growth. Due to its weight in employment and value added, the most important target group for the development of businesses is small and medium-sized enterprises. With implementation of the comprehensive competitiveness measures, due to the significant, readily available productivity reserves, labour productivity can be doubled at small and medium-sized enterprises by 2030, and thus their average output per capita increases by almost 6 percent annually on the macroeconomic path characterised by competitiveness reforms. This may be supported by better utilisation of economies of scale within the Hungarian SME sector. Based on our calculations, even just a more concentrated SME structure would be able to raise the productivity of the SME sector by more than 20 percent. On the other hand, Hungarian SMEs tend to use the available advanced technologies to a lesser degree. Thus, a higher penetration of the available technologies alone would significantly stimulate the performance of Hungarian small and medium-sized enterprises. In the case of the large enterprises, we project annual growth of 3 percent on average until 2030.

The long-term objective is to develop an entrepreneurial ecosystem that tangibly supports the renewal and flexibility of the economy. In the area of research and development, the most important task is to ensure that enterprises' R&D expenditures increase both in terms of volume and efficiency. By European standards, Hungarian small and medium-sized enterprises are less keen on innovation. This lag is attributable to a number of factors, the most important ones being the shortcomings in entrepreneurship and the low willingness of enterprises and higher education institutions to engage in cooperation. In addition, several studies have shown that foreign market entry and joining international production chains are important innovation incentives for SMEs. Participation in external trade entails higher corporate employment, labour productivity and total factor productivity; exporting and importing enterprises are more competitive both in the external and domestic markets. Based on our estimates, an additional 10,000 new exporting companies would generate significant growth in productivity.

Hungary's integration into global value chains and its economic openness are outstanding by European standards; it is necessary to maximise the macroeconomic benefits and spillover effects of the foreign companies which are already active

in Hungary or may arrive in the future. This can be facilitated by developing the corporate ecosystem mentioned above and by Hungarian enterprises which provide knowledge-intensive services joining the supply chain as intensively as possible. In addition to increasing domestic value-creating capacity, this process would also reduce the import-intensiveness of production. In addition to the foregoing, a modern development policy should replace the earlier, industry-based focus by supporting technologies that fit in with global trends.

The reform path requires a financial system that ensures the sustainable financing of the economy built on innovation, knowledge and gains in productivity. In the corporate lifecycle, we identified two phases where fund raising is still a problem, and thus easing financing constraints is crucially important in those phases. One of these is the start-up phase when an enterprises' assets are insufficient to serve as bank collateral. The survival of innovative, start-up businesses can be facilitated by increased lending by angel investors, and deepening market know-how is also a major objective. The entry of mature companies into the open capital market would also mitigate the financing problems faced by medium-sized enterprises: huge growth potential can be identified on the capital market with respect to capitalisation and the number of listed firms. Smaller companies may launch bond issue programmes as an alternative way to obtain external funds, while using households' savings may also become a popular and favourable form of investment among households in the future.

In Hungarian financing, funds are typically allocated by the banking system, and therefore the deepening of banks' credit penetration is a necessary condition of macroeconomic convergence. In addition to the reforms, the realisation of a credit path supporting dynamic economic growth may result in a strong rise in the banking sector's outstanding lending-to-GDP ratio (and balance sheet total). Nonetheless, rapid credit growth occurs in equilibrium only if the real economy expands steadily and in a sustainable manner. The surge in lending must involve a larger group of customers, and occur in a sound structure, at the lowest possible cost. The sustainability of the corporate sector's indebtedness may be ensured by the access to credit by a broader range of SMEs on the one hand and investment lending to enhance productivity on the other hand. The guarantee system could also play a key role in increased lending to SMEs, opening up access to loans for firms that are creditworthy but do not correspond to the risk appetite of most banks.

Achieving this credit path is unimaginable without a competitive banking sector. The sub-pillar of the Bank Competitiveness Index (BCI) developed in 2017 which captures digitalisation in banking shows shortcomings in the development of digital and financial channels in an international comparison. Progress made in this respect may affect all economic agents. The level of development and spread of digital banking products also calls for the modernisation of banks' internal systems and processes, which may entail a gradual decline in the currently high costs-to-assets ratio. Selling banking products via digital channels may also contribute to this path, but technological progress also requires an accommodative, rational regulatory environment.

The growth capacity of enterprises is strongly influenced by the institutional environment in which they function. One of the most important elements of this institutional environment is the state, which impacts competitiveness via several channels and thus also influences macroeconomic growth and convergence. On the one hand, due to its size, the state uses significant resources. E-governance is able to provide substantial support for the more economical functioning of state and the reduction of the headcount in the government sector, thereby freeing up labour for the private sector. Since productivity is higher in the private sector than in the public sector, the realignment of employment in this way alone supports the growth in macroeconomic productivity. Lower bureaucratic burdens tie up the resources of the private sector to a lesser degree, thereby improving the efficiency of enterprises. On the regulatory side, the state may help curb the hidden economy, the excessive size of which generates competitive disadvantages for lawfully operating enterprises and also reduces the revenues of the budget. Thus, the government's efficiency not only contributes to productivity growth, but also provides the countercyclical room for manoeuvre, which – based on the lessons learnt from the crisis – is necessary for the achievement of a balanced growth path.

In addition, one of the key roles of the state is to provide the private sector with fundamental – or in other words, critical – infrastructures. The traditional infrastructures (road, railway, water transport, etc.) continue to be important for a country's competitiveness. In addition, in the 4th industrial revolution, telecommunications, and particularly the possibility of wireless data transmission, are also gaining importance. Furthermore, by developing a proper energy mix and fostering energy efficiency, the state may reduce the country's energy dependency and contribute to the maintenance of the trade surplus.

1 The conditions for sustainable convergence – Pitfalls and entry points

2010 marked the end of procyclical economic policy in Hungary, which had sacrificed macroeconomic stability for short-term economic growth prior to the crisis. The fiscal reforms and turnaround in monetary policy put the Hungarian economy back on a growth trajectory in 2013. The new model was based on rising employment, the transformation of the tax regime, the establishment of macro-financial stability and a monetary policy that supports economic growth through new, innovative instruments. As a result of the economic policy turnaround, convergence with the economic development level of advanced European countries gained new momentum. To allow convergence to continue even in the constantly changing world economy, Hungarian economic policy needs to find ways to raise productivity and capital intensity on the one hand, and work to bolster the adaptive capacity of the economy on the other hand. As full employment is approached and demographic constraints become tighter, the previous labour-intensive growth must be increasingly replaced by a capital- and knowledge-intensive model.

It is vital to appropriately manage the pitfalls threatening the Hungarian economy to ensure that economic growth remains sustainable in the long run. In Hungary, along with the declining size of the population, ageing may also increasingly stifle growth. The higher old-age dependency ratio may prove to be a challenge to the major social security systems (pension system, healthcare). In line with demographic constraints becoming ever more severe and rapid technological progress (automation), competition for labour has become global. Retaining and attracting the appropriate quality and quantity of labour is also crucial for Hungary, as this is the basis of the capital- and knowledge-intensive growth model. The Hungarian economy has recently become increasingly integrated into the manufacturing global value chain, especially in the automotive industry. However, the sector's value-creating capacity is relatively low, and the economy has become more vulnerable to fluctuations in external demand due to the rise in specialisation and openness. Long-term convergence depends on the productivity of the corporate sector. The SME sector is crucial in the economic system, but there is a huge gap between the productivity of large enterprises and SMEs in international comparison. Corporate duality is due to factors such as the fragmentation of the SME sector, the low number of exporting SMEs, shortcomings in management capabilities, the difficulty of a fresh start as well as the low technological readiness and innovation capacity of the sector.

With the current structure of the economy, the GDP–GNI gap is expected to widen, which needs to be avoided with targeted measures to improve competitiveness. Bolstering the productivity of the SME sector, strengthening domestic financing and thus lowering the interest balance are key elements in closing the GDP–GNI gap. Long-term, sustainable economic growth is based on financial stability and sustainable financing. However, this requires that companies have access to the appropriate amount and structure of external financing through all stages of their life cycle. In addition to avoiding the traps inherent in demographic developments, the economic structure and financing, a psychological turnaround is needed in society to enter on a new growth trajectory.

New global megatrends serving as entry points for Hungary have appeared or strengthened recently. The expansion and ageing of the world's population, the widening of the global middle class and rapid urbanisation have the potential to rearrange income and consumption patterns. Hungary and the Visegrád region are situated on the transit route between the developed countries of Western Europe and the rapidly developing Asian markets, which creates a perfect opportunity for the traditional service sectors (tourism, transportation) as well as modern services. The world has entered a new technological cycle. The new, disruptive technologies can transform the structure of economic production and labour markets. In order to move towards higher value-added production and services, participation in innovation, the use of new technological inventions and solutions, and furthermore, a modern physical and digital infrastructure is essential. Nowadays, services are offered globally: they are not bound to a physical location thanks to the widespread use of the Internet. The spread of digital platforms and changing consumer trends may offer entry points for SMEs. The issues of sustainability and energy efficiency are crucial when analysing the challenges of the upcoming decades. Identifying the trends and harnessing the opportunities of the changing global energy mix are also critical for Hungary.

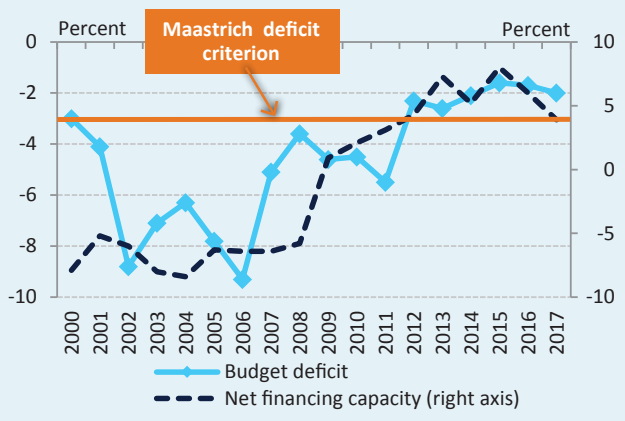
1.1 Economic policy and macroeconomic developments since 2010

2010 marked the end of procyclical economic policy in Hungary, which had sacrificed macroeconomic stability for short-term economic growth prior to the crisis and then led to austerity measures and a severe recession after the macroeconomic path became unsustainable and the crisis erupted. The new economic governance first executed a turnaround in fiscal policy and then later in monetary policy as well, which helped restore financial stability and jumpstart economic growth. **Overall, harmonising the two main branches of economic policy resulted in an innovative, growth-friendly economic policy**, which has led to the long-awaited balance between macro-financial equilibrium and growth since 2013.

1.1.1 STRUCTURAL PROBLEMS PRIOR TO THE CRISIS

Even before the crisis, Hungary faced serious structural issues and was very vulnerable. By the mid-2000s, the economy was only able to grow in conjunction with a high budget deficit and rapidly rising external indebtedness (Chart 1-1). Due to the persistently high government deficit, Hungary was already subject to the EU's excessive deficit procedure in 2004. On account of the rising indebtedness, the assessment of the economic outlook gradually became bleaker, which rendered financing the state and the economy more expensive.

Chart 1-1: Government deficit and the financing position in Hungary

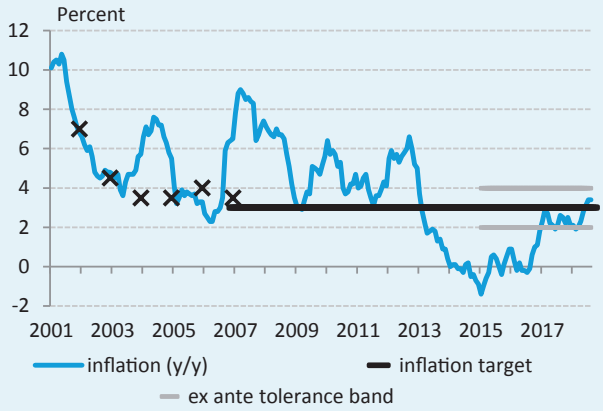


Source: Eurostat.

One of the economy's biggest structural problems was that the Hungarian employment rate was among the lowest in the European Union, which could not be changed by the short-term growth driven by debt accumulation. The low employment rate was primarily caused by the high taxes on labour and shortcomings at institutions checking eligibility for social transfers.

The relationship between fiscal and monetary policy was characterised by fiscal dominance before the crisis. With a steadily loose fiscal policy, monetary policy was unable to ensure price stability even with persistently high nominal and real interest rates. Hungarian inflation typically fluctuated well above the inflation target (Chart 1-2).

Chart 1-2: Development of inflation



Note: Inflation targeting was introduced in Hungary in 2001.
Source: MNB, HCSO.

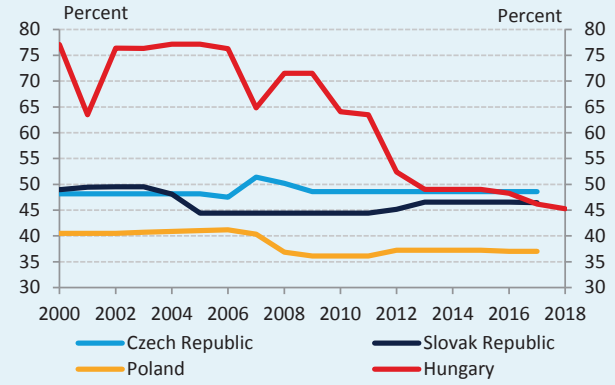
The vulnerability of the economy was exacerbated by the fact that – due to high inflation and nominal interest rates as well as an inadequate regulatory framework – households and companies increasingly turned to FX loans. As a result, the foreign currency exposure of the economy increased considerably, rendering the economy particularly vulnerable to exchange rate depreciation. Moreover, the spread of FX loans further reduced the efficiency of monetary policy transmission with respect to maintaining price stability and smoothing business cycles.

1.1.2 FISCAL TURNAROUND

One major factor in establishing macroeconomic stability was the tax system reform with a view to boosting employment. Until 2010, the Hungarian tax system was characterised by extremely high rates and progressivity with respect to taxes on labour (Chart 1-3). The large tax wedge and the high marginal tax rate ate into a major portion of the

income received for extra work, which encouraged the concealment of income and made the creation of jobs with high value-added expensive. In 2011, the new government introduced a flat-rate personal income tax supplemented with targeted allowances. The newly introduced 16-percent tax rate was lower than the lowest rate in the previous multi-rate tax regime.

Chart 1-3: Marginal tax wedge in the Visegrád countries

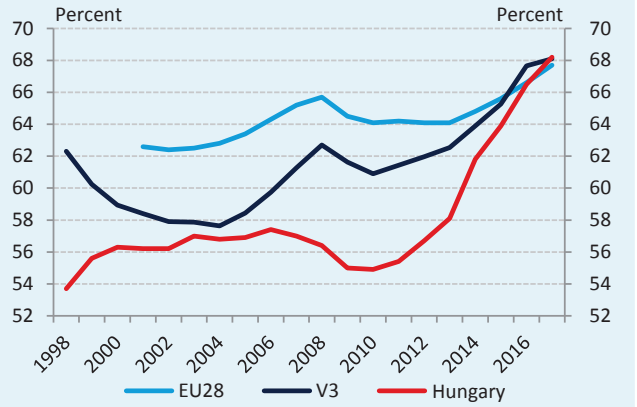


Note: For single, childless workers earning 100 percent of the average wage.
Source: authors' calculation based on OECD data.

Personal income tax became completely linear after the gradual phase-out of the tax credit, the super gross tax base and the pension contribution cap. In and of itself, the elimination of tax credits from 2012 would have increased the tax burden on low-income workers, but this was offset by the government through several targeted measures. **As a result of the "expected wage increase" supported by contribution allowances, the roughly 20-percent increase in the minimum wage and the introduction of the Job Protection Action Plan, low-income households' income did not decrease even in the short term.**

The reduction of the taxes on labour and the reform of the social benefits system which did not adequately incentivise work (e.g. tightening the controls on disability pensions and the options for various early retirement schemes) led to a turnaround in employment. **The number of people in employment rose from 3.7 million to 4.4 million between 2010 and 2017, and the employment rate reached the European Union average (Chart 1-4).**

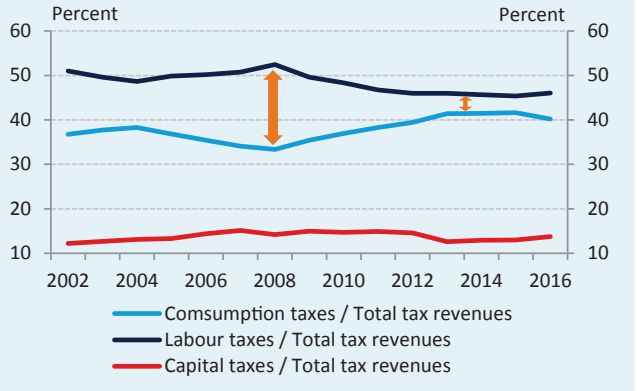
Chart 1-4: Employment rate in Hungary, the V3 region and the EU28



Note: Among 15–64-year-olds.
Source: Eurostat.

The higher employment rate substantially expanded the tax bases. Thanks to this, **a large portion of the tax cuts financed themselves**. Three quarters of the direct revenue-decreasing effect of the lower tax rates were compensated by the expansion of tax bases (Baksay and Csomós, 2014). With respect to the revenue-increasing measures necessary to ensure fiscal balance, the government focused on curbing economic growth as little as possible through the tax hikes. The measures included raising the VAT rate and the introduction of the special sectoral taxes in the services sectors with greater resilience. Tax revenues were further boosted by government measures aimed at reducing the shadow economy. The establishment of an online link between the retail sector's cash registers and the tax authority considerably increased VAT revenues in 2014–2015 without changing the tax rate. As the tax structure was overhauled, the share of taxes on labour within tax revenues decreased significantly, while the proportion of consumption taxes rose strongly (Chart 1-5).

Chart 1-5: Changes in the Hungarian tax structure (tax types as a percentage of total taxes)



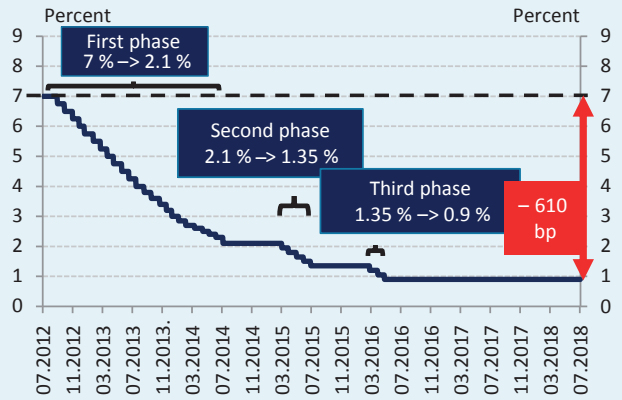
Source: Eurostat, MNB.

1.1.3 ACCOMMODATIVE MONETARY POLICY

An essential element of the successful economic policy turnaround was consistency between fiscal policy and monetary policy. After the monetary policy turnaround in 2013, the central bank's measures contributed greatly to strengthening macroeconomic stability.

The gradual base rate cuts significantly reduced the financing costs of all economic sectors, thereby supporting a pick-up in consumption and investments (Felcser et al., 2015). **Following the gradual interest rate cuts implemented in several stages, the policy rate dropped to 0.9 percent by 2016, reaching an all-time low in Hungary** (Chart 1-6).

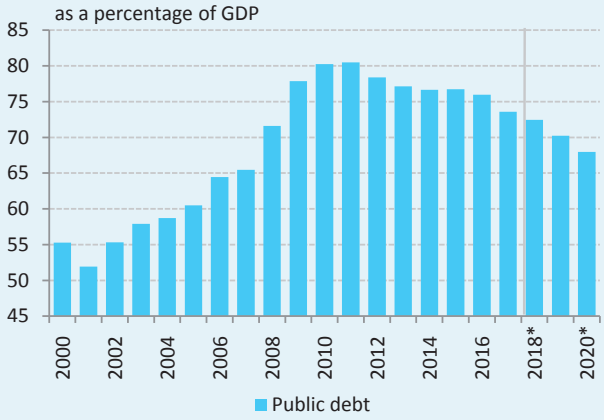
Chart 1-6: Central bank base rate in Hungary



Source: MNB.

The monetary policy turnaround provided substantial support to fiscal policy. As a result of the interest rate cuts launched in mid-2012, the budget's interest expenses relative to GDP fell from 4.3 to 2.6 percent in five years. The accommodative monetary policy and the fiscal reforms allowed Hungary to exit the excessive deficit procedure in 2013. The government deficit was steadily below 3 percent, and government debt embarked on a downward path (Chart 1-7).

Chart 1-7: Hungarian government debt path

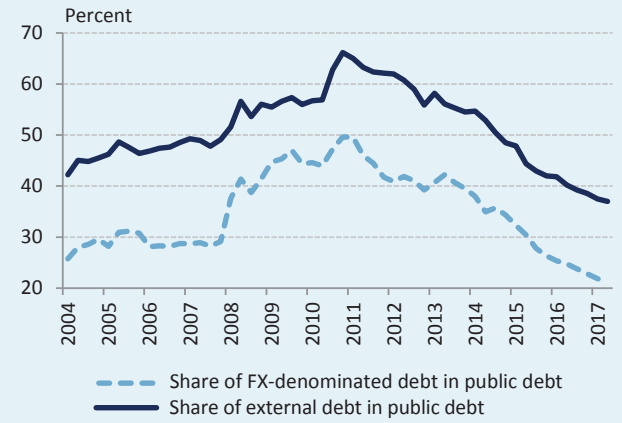


*Note: *the 2018–2020 figures are based on MNB projections.*
Source: MNB.

The launch of new, innovative and targeted central bank programmes was a key element in the monetary policy turnaround. One of the most significant steps was the Funding for Growth Scheme and the subsequent Growth Supporting Programme. **The Funding for Growth Scheme announced in the spring of 2013 marked a turnaround in SME lending.** The new programme put an end to the 5-percent average annual drop in SME loans observed in the years prior to the launch, which threatened to cause a considerable, protracted slump in potential growth. Under the lending scheme, 40,000 SMEs received preferential loans, in a total amount of HUF 2,800 billion.

The MNB's new, innovative programmes contributed greatly to mitigating Hungary's external vulnerability and improving its risk assessment. Within the framework of the Self-Financing Programme, the central bank encouraged commercial banks to hold their liquid funds in liquid securities other than the MNB's sterilisation instrument. The conditional central bank interest rate swap was introduced to reduce the risks faced by commercial banks. The programme transformed the investor structure of government debt by considerably lowering the share of foreign ownership, which also allowed for a significant reduction in the foreign currency ratio (Chart 1-8).

Chart 1-8: Foreign ownership and the foreign currency ratio of the central government debt within Hungarian government debt



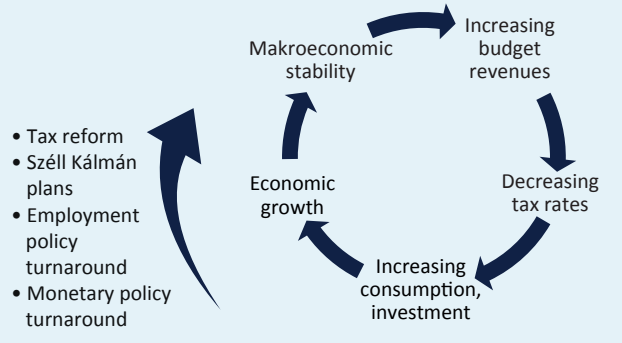
Source: MNB, Government Debt Management Agency.

Settling the matter of household FX loans represented a major step towards reducing external vulnerability. The conversion of household FX loans started in 2014 with the phase-out of household FX loans, followed by personal and vehicle loans in 2015. The foreign currency liquidity necessary for the conversion of FX loans was provided by the central bank, and the average monthly instalment of housing loans shrank by 25 percent on average after the conversion.

1.1.4 HUNGARIAN ECONOMY ON A GROWTH PATH

The establishment of macroeconomic stability and the growth-supporting government measures put the economy on a new growth path. Thanks to the successful turnaround, a positive feedback loop emerged between growth and macroeconomic equilibrium (Matolcsy, 2015). Economic growth substantially increases budget revenues, a part of which the government uses for further reductions in taxes and contributions. These allow the results of the economic policy turnaround to be felt much more widely, and provide renewed momentum for growth (Chart 1-9).

Chart 1-9: Economic policy turnaround places the economy on a growth path



Source: MNB.

Since 2013, Hungary's economic growth has been among the fastest in the European Union. Growth was based on the turnaround in employment that happened in the wake of the above-mentioned measures, whereby the number of people in employment rose by over 700,000. This allowed the Hungarian economy to grow by 3.4 percent on average annually between 2013 and 2018, while the EU average is below 2 percent.

Among the further gradual tax cuts enabled by the turnaround in economic policy and growth as well as the restoration of the macro-financial stability, the gradual reduction of the social contribution tax, announced in 2016, deserves special mention. This measure lowers the contributions paid by employers by more than half between 2016 and 2022. In the short run, the tax cut means savings for employers, but it can also significantly boost employees' income as well over the medium term. Employees' earnings were also increased by the further reduction of the personal income tax in 2016, which the government wishes to continue with further cuts in the future. Moreover, the government also lifts households' income through various targeted measures. For families with children, the gradual increase in the family tax base allowance represents a major plus in income. The earnings of low-income workers are increased by the surge in the minimum wage implemented in several steps, while the purchasing power of their income grows due to the reduction of the VAT rate on certain basic food products. Besides the government measures affecting employees' income, the corporate tax cuts should also be mentioned. Following the extended applicability of the lower, 10-percent tax rate in 2010, a flat-rate, 9-percent corporate tax was introduced in 2017, making the Hungarian capital tax the lowest in the European Union.

The economic policy turnaround established macroeconomic stability and supported growth, paving the way for Hungary's economic convergence. The expansion of employment, the pick-up in investments and consumption as well as the rise in lending have recently underpinned convergence with the more advanced European economies. However, the convergence process may run out of steam with the currently available technology and the quantity and quality of human resources. Economic policy needs to find new ways to foster economic growth. **The expansion of human resources may hit quantitative limits over time, and therefore the main aim is to improve the quality as well as the capital intensity and productivity of the economy.** Although the changing global economic environment entails serious risks regarding the Hungarian economy's prospects, it also offers new opportunities for convergence. If the

Hungarian economy wishes to exploit these opportunities, it is crucial for economic policymakers to correctly identify the most important trends shaping the world economy and take steps of an appropriate magnitude and effectiveness to strengthen the adaptive capacity of the economy.

1.2 Pitfalls faced by the Hungarian economy

Sustainable economic convergence can be achieved by **raising Hungary's productivity**. In recent years, labour productivity has been subdued, as economic policymakers primarily focused on restoring macroeconomic equilibrium and tapping labour market reserves. However, as **full employment is approached**, the previous labour-intensive economic growth must be increasingly replaced with a **capital- and knowledge-intensive model**.

The new growth model is based on productivity growth, which can be attained by **boosting capital intensity** and **improving the competitiveness** of the Hungarian economy. The new model must provide answers to the main challenges faced by Hungary and must adapt to the changing developments in the global economy. This subchapter deals with the **pitfalls** faced by the Hungarian economy, **which must be appropriately managed to achieve capital- and knowledge intensive economic growth** and thus also to improve productivity.

1.2.1 DEMOGRAPHY

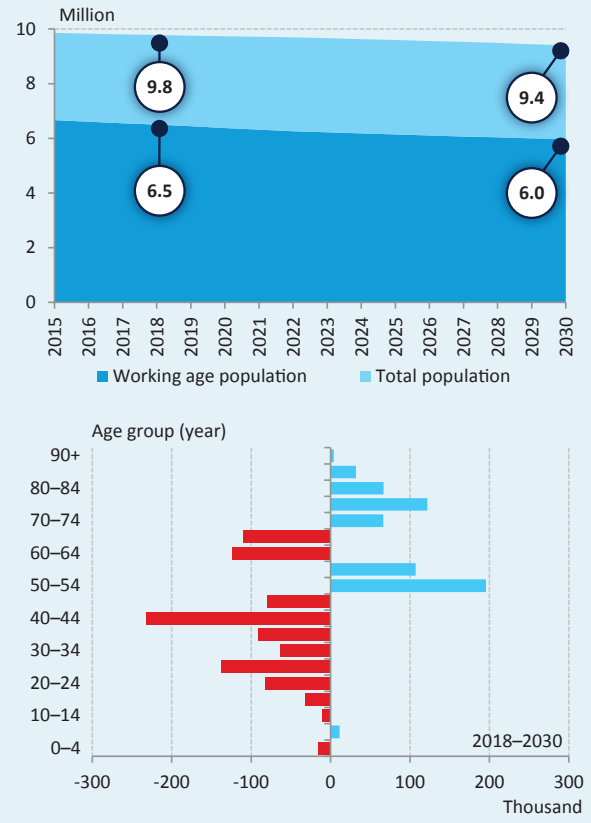
In 1980, the population of Hungary was 10.7 million. **In the approximately four decades that have elapsed since then, this figure has gradually fallen**, reaching 9.8 million in 2018. Thanks to the uptick in economic growth in recent years and the active labour market policies, participation and employment have reached historic peaks. **However, as full employment is approached, demographic constraints may become increasingly effective.**

Similar to the majority of European countries, Hungarian demographic developments are characterised by a **decline in population** and the **ageing of society**. The number of births cannot compensate for the decrease due to deaths, and therefore the population has shrunk by 38,000 people on average in recent years. As the so-called "Ratkó children" born in the 1950s retire and the so-called "Ratkó grandchildren" born in the 1970s gradually move away from their fertile age, **addressing the demographic challenges becomes increasingly pressing**.

The number of births and deaths is determined by a combination of several factors. In the past decade, the **number of women of childbearing age declined**, which may increasingly represent an effective constraint in the coming years. Although the **total fertility rate**, which measures natural reproduction, has recently increased, it **still falls short of the EU average**. **Life expectancy** in Hungary is **low by international standards**. The figure of 76.2 years for the whole Hungarian population is well below the European Union average (81 years) and even the Visegrád countries (78.1 years).

Achieving dynamic, sustainable economic growth over the long term means that **demographic constraints must be eased** and the reproduction of the Hungarian population must be fostered. Without a turnaround in the number of women of childbearing age and the total fertility rate, **population decline will continue in the coming decades** (Chart 1-10). Compounding the situation, in addition to the drop in population numbers, **the structure of the population** – the population pyramid – **may become less favourable** in the next decades. The **size of the working age population may shrink more** than the total population, and therefore the number of 15–64 year-olds may fall to about 6 million by 2030. The population may increase mainly among those above 70 and between 50 and 60, while **the number of those in their prime working age (25–54 year-olds) and the young may continuously decrease**.

Chart 1-10: Expected evolution of population and age groups in Hungary



Note: Based on the assumptions of the middle income trap scenario presented in the chapter on Human capital of the Growth Report.
Source: HCSO, MNB.

The decline in the total population and the working age population, complemented by the ageing of society may both **hamper sustainable economic growth over the long term**. The continuous contraction of potential labour could hinder the capacity expansion of companies in the production and service sector, while the contraction of the working age population could increasingly mean a lower tax base for the budget, and the rise of the old-age dependency ratio poses a challenge to the pension and healthcare system. **The absence of a demographic turnaround dampens growth prospects** and **poses challenges to macroeconomic sustainability as well**.

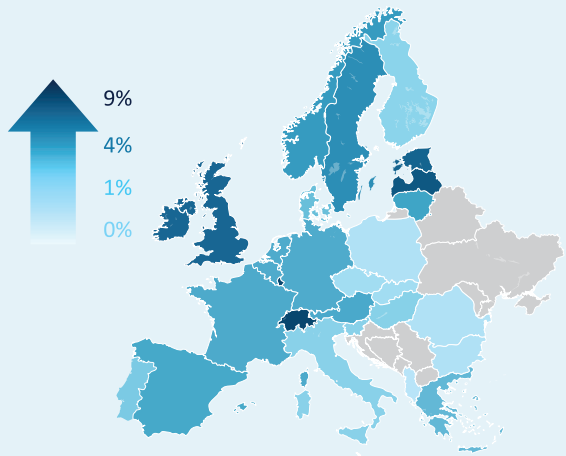
1.2.2 COMPETITION FOR SKILLED LABOUR, BRAIN DRAIN

The amount of labour that can be involved in production is determined by demographic developments as well as the **flow of workers across countries**. In the past decades, **globalisation** has become more and more widespread, and **labour mobility has also increased** as labour markets have become closely linked. Two main trends can be identified in the global flow of labour since 1990: the **increased inflows from Asia to the developed countries** and the **dynamic mobility of skilled labour across developed countries** (European Commission, 2016).

As economies and societies increasingly become knowledge-intensive, **the demand for skilled labour is growing**. The appropriate quantity and quality of labour are vital for higher value-added production and services. Moreover, **digitalisation** and **automation are transforming labour markets**, which increases the significance of **workers with the necessary skills and abilities**. The positive impact from attracting skilled labour arises through various channels in the host countries, such as the connection to knowledge networks, increased entrepreneurship and a higher number of students at universities (OECD, 2008).

According to the analysis of the OECD (2017a), more than 25 percent of the workers heading to the G20[1] countries are graduates. The European Union and the US are special even among large economies, because they are typically the most popular targets for highly-skilled workers (European Commission, 2016). Among European countries, **western and northern countries are clearly more attractive**, and these regions have substantially **higher inflows of high-skilled workers** than Central and Eastern Europe (Chart 1-11).

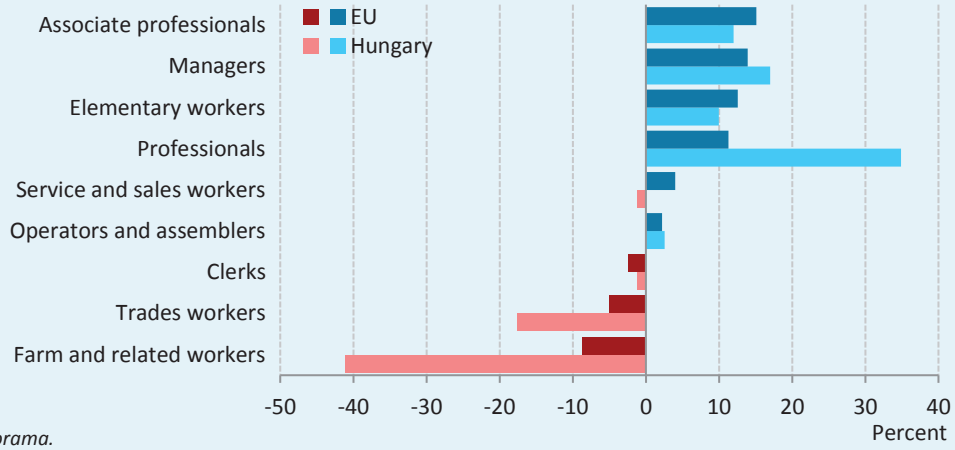
Chart 1-11: Share of higher educated immigrants in total population



Note: Based on 2010–2011 data.
Source: OECD–DIOC, Eurostat.

[1] The group comprising the 19 largest economies in the world and the European Union.

Chart 1-12: Expected change in employment by occupation (2016–2030)



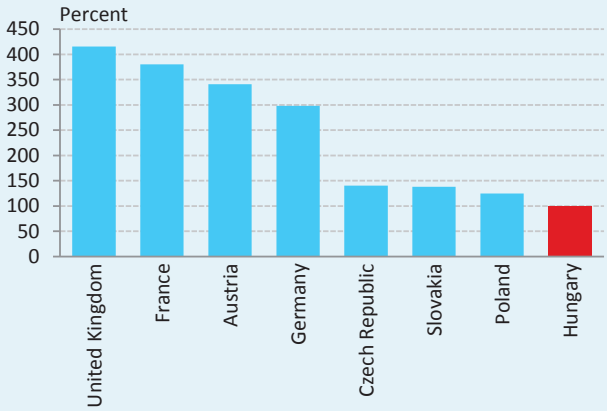
Source: Skills Panorama.

According to an analysis by Petersen and Puliga (2017), labour mobility within Europe has accelerated significantly since the 2004 enlargement, which has also influenced the labour markets of the countries in the CEE region. The authors found that **between 2005 and 2014, the flows from east to west represented 29 percent of total flows**, while the counter-migration amounted to merely 7 percent. Migration from the CEE region was typically **linked to the healthcare, engineering, business and legal professions**.

In the years and decades ahead, **competition for skilled labour may become global**. In developed countries, as **demographic constraints tighten** and **technological progress moves forward rapidly**, there will be unprecedented demand for skilled workers in their prime working age. Based on the projection by the OECD and the EU (2016), over 100 million new jobs will be created in the European Union between 2013 and 2025; therefore **the significance of retaining and attracting skilled labour will steadily increase**. **Stopping the brain drain is also a huge challenge** for Hungary, because in the decades ahead the same jobs – typically high-skilled – may be in demand in other countries of the European Union than in Hungary (Chart 1-12). **Retaining engineers, managers and other scientific, healthcare and business professionals is key and also the basis for sustainable convergence.**

The CEE region and **Hungary have typically faced outflows of skilled labour in the recent period**. Workers' decisions are strongly influenced by the general economic climate as well as individual career opportunities and salaries, as well as business climate and taxation. **Hungarian net wages still fall well short of those in the countries to the west** and are also relatively low in comparison to the Visegrád countries (Chart 1-13). One basic element of retaining Hungarian workers is **wage alignment**, since net earnings in neighbouring Austria are approximately 3.5 times higher than those in Hungary on average.

Chart 1-13: Net earnings compared to Hungary (2017)



Source: MNB estimation based on European Commission and OECD.

The short geographical distances, the increasingly surmountable language barriers and flexible forms of employment facilitate labour migration and employment abroad, but **retaining skilled labour in Hungary and attracting such workers is key in a capital- and knowledge-intensive growth model and for sustainable economic growth**.

1.2.3 VALUE-CREATING CAPABILITY OF THE ECONOMY

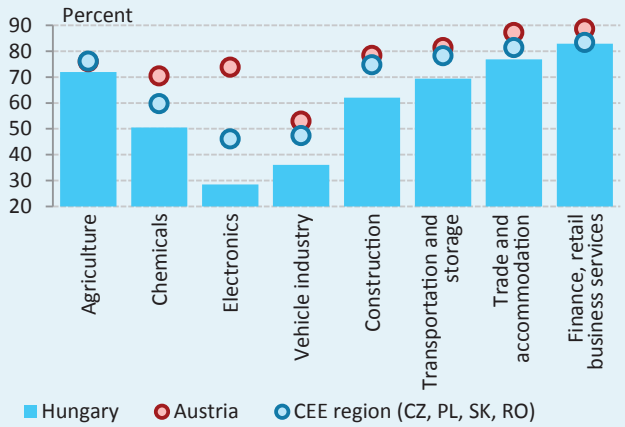
In recent decades, the global economy has become increasingly integrated, and global trade growth exceeded global GDP growth until the 2008 crisis. The ever-closer cooperation between national economies and companies **led to the emergence and expansion of global value chains**. Interconnectedness is substantial: around one-fifth of the exports of a given economy includes value added from other

countries, consistent with imported **intermediate goods and services** (Vrh, 2018). Koopman et al. (2014) pointed out the significance of the value-added content of exports and thus the position of individual countries (companies) in global value chains.

Since the 1990s, **the Central and Eastern European region has also become actively integrated into global value chains**. Hungary and the neighbouring countries mainly developed **manufacturing production capacities**. Participation in global value chains can help boost productivity (Grossman and Helpman, 1991a), but the role played in the chain strongly influences the significance of the Hungarian and foreign productive and service capacities. Baldwin (2012) and Ye et al. (2015) showed that **the largest value added is produced at the beginning and end of the chain** during the value-creation process, while production usually depends strongly on imports of intermediate goods and services.

Hungary's openness has increased significantly in recent decades, and exports have nearly doubled relative to GDP compared to the 1990s. This was mainly explained by **FDI inflows**, the **expansion of productive capacities** and thus **integration into global value chains**. This growth mainly affected manufacturing – especially **vehicle manufacturing** – in the recent period, as the region has become a major production centre for the German vehicle industry chain. Meanwhile, the **sector's value-creating capacity is relatively low**, and the domestic value-added content of the Hungarian vehicle industry exports falls short of the regional level (Chart 1-14). In addition, **the Hungarian economy has become more vulnerable to fluctuations in external demand**, due to the rise in specialisation and openness.

Chart 1-14: Domestic value-added content of gross exports (2014)

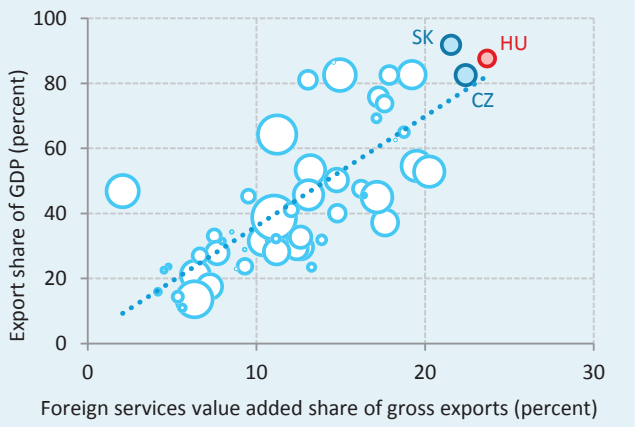


Source: OECD–WTO.

In moving up the global value chains, shifting towards higher value-added production and services is a prerequisite for improving productivity. The low innovation capacities of Hungarian companies, the lack of the widespread use of modern technology and the emigration of skilled labour all contribute to the low value-creating capacity of the Hungarian economy (Caraballo and Jiang, 2016; Kowalski et al., 2015; OECD, 2013; Stehrer and Stöllinger, 2015). As the global value chains deepen, advanced technology can influence productivity in two ways. Total factor productivity (TFP) rises through the **development of frontier technology** and its spillover effects on the one hand, and the **changes in the distance from the frontier**, in other words companies' ability to use the existing technologies, on the other hand. The analysis by Chiacchio et al. (2018) found that **the subdued post-crisis TFP in Central and Eastern European countries is mostly due to the decreasing absorption of technology** (the greater distance from the frontier), whereas the slower development of the frontier technology has much weaker explanatory power.

Services have recently become increasingly relevant in global value chains (Dachs et al., 2012; Stehrer et al., 2012). Manufacturing activities have become more and more **service-intensive**, and numerous services are linked to **products even after they are purchased** (World Bank et al., 2017). The increase in the value-creating capacity of the economy is influenced by the significance of services in production and exports and the domestic service content of services. In international comparison, Hungary's exports have a **high foreign service content**, just like Slovakia and the Czech Republic (Chart 1-15). Domestic service providers do not contribute much to exported services, which explains the low value-creating capacity of Hungarian producers and suppliers and thus also their position in global value chains.

Chart 1-15: Relationship between foreign services content and export share (2014)



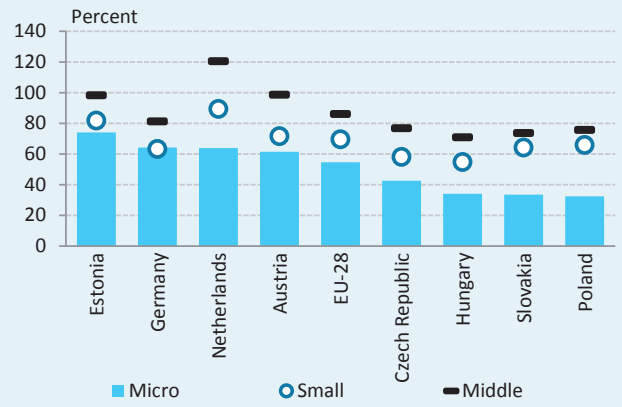
Note: The size of the circles represents the relative GDP/capita. Countries with export share of GDP exceeding 100 percent (Hong Kong, Ireland, Luxembourg, Singapore) are excluded.
Source: OECD–WTO, World Bank.

1.2.4 CORPORATE DUALITY

Besides the high value-creating capacity, a **healthy corporate structure and a productive corporate sector** are also crucial for sustainable economic growth over the long run. **The largest productivity reserves can be identified in the case of SMEs.** Similar to most European Union countries, small and medium-sized enterprises (SMEs) are the **backbone of the Hungarian economy**. The SME sector accounts for over 99 percent of total companies and more than 70 percent of employment in the national economy. Nevertheless, despite their significance, SMEs produce less than half of Hungary's GDP, which underlines the issue of the **pitfall of corporate duality**.

The labour productivity of the Hungarian SME sector is substantially lower than in Western Europe and the EU average, and **there is a huge gap between the productivity of large enterprises and SMEs in Hungary (**Chart 1-16). The shortfall in the value added created per employee can also be identified in the case of micro, small and medium-sized enterprises. The productivity of Hungarian microenterprises is 34 percent of large enterprises, whereas the corresponding figure is over 42 percent in the Czech Republic and close to 55 percent on average in the EU. The labour productivity of Hungarian small and medium-sized enterprises is even lower than in the Visegrád countries.

Chart 1-16: Labour productivity relative to large enterprises (2014)

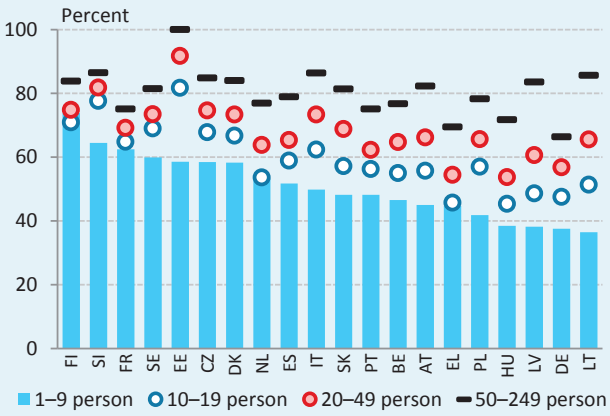


Source: Eurostat.

The duality in the productivity of companies is due to various factors. 91 percent of the Hungarian SME sector is composed of **microenterprises which exhibit low productivity**, while the same figure in Germany, where SMEs are more competitive, is 81.5 percent. At the same time, in Germany the significance of small enterprises is almost twice as high as the Hungarian figure. The fragmented corporate sector prevents **the utilisation of the benefits arising from economies of scale**, which contributes to the strongly dual structure of the corporate sector. The dominant share of microenterprises also influences the exposure to external shocks and the **vulnerability of the economy in the face of crises**. Based on De Kok et al. (2011), smaller firms felt the impacts of the 2008 crisis much more acutely.

In addition to low productivity, the **wages** paid by micro, small and medium-sized enterprises **fall well short of those paid by large enterprises and are also low by European standards** (Chart 1-17). Wages paid by manufacturing microenterprises are higher in all neighbouring countries than in Hungary (in PPP terms), and wages paid by Hungarian medium-sized enterprises are merely 50 percent of Austrian or German companies. The reduction of the duality requires an appropriate quantity and quality of labour, but **Hungarian SMEs experience a brain drain from two sides** (both from domestic large enterprises and from abroad), **due to the low wages**.

Chart 1-17: Labour costs per capita relative to large enterprises (2014)



Note: For manufacturing companies, in PPP terms.
Source: MNB based on OECD (2017b).

The low labour productivity of the sector is also attributable to other pressing issues such as the **low number of exporting SMEs, shortcomings in management capabilities, the difficulty of making a fresh start** and **the low technological readiness of the sector**. The OECD (2018) argues that **Hungarian firms have very limited chances to make a fresh start**, mainly due to the long time it takes, even by international standards, to get from bankruptcy to starting anew. Companies' productivity is influenced by the number of new businesses (Cumming, 2012) and the difficulty of a fresh start (Burchell and Hughes, 2006).

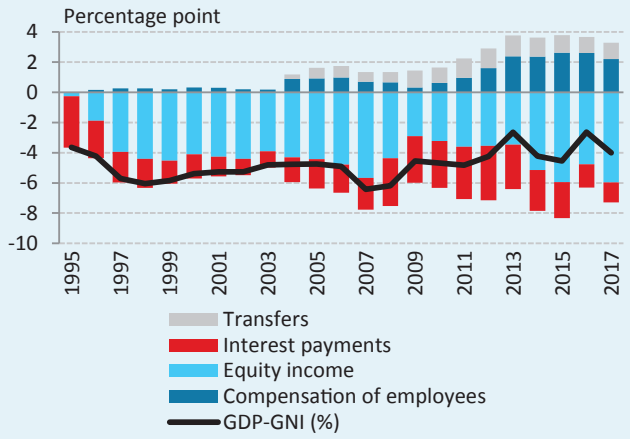
Between 2012 and 2014, **only slightly more than 24 percent** of Hungarian SMEs were involved in **innovation** (products, processes, marketing or organisational innovation), which is lower than the European average. The share of innovative

SMEs in Germany is close to 66 percent and is also above 50 percent in Austria, the Netherlands, the UK and France (OECD, 2017c). In addition to the low innovation capacity, the country also lags behind in the use of new technological solutions, such as cloud-based services, big data and advanced corporate planning and management solutions (ERP, CRM) (OECD, 2017c).

1.2.5 GDP-GNI GAP

Of course, in addition to the structure of the economy, income developments influence sustainable convergence as well. **Gross national income** (GNI) also takes into account income flows between residents and non-residents and may therefore deviate from GDP in each country. **The GDP–GNI gap**, which amounted to 5–6 percent of GDP before the crisis, **started falling after the downturn**, shrinking to 3–4 percent of GDP in recent years (Chart 1-18).

Chart 1-18: Decomposition of the GDP-GNI gap (in percent of GDP)



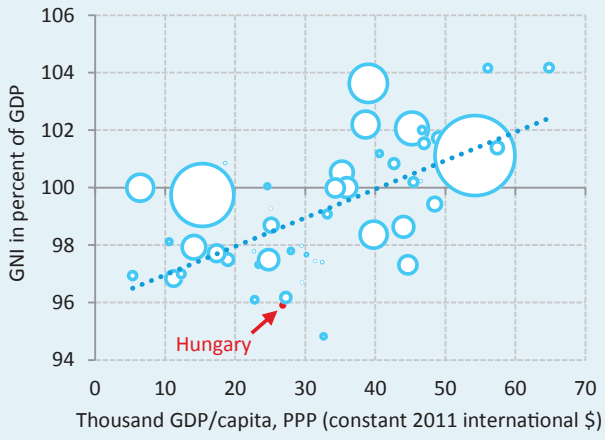
Note: Preliminary data for 2017.
Source: MNB.

In the period with a stable GDP–GNI gap between the late 1990s and 2006, the gap was mainly influenced by the profits of foreign companies. After joining the European Union, the compensation of employees and the inflow of EU transfers, which is relevant from the perspective of GNI, increased considerably, but at the same time, as a result of the growth financed by foreign indebtedness, interest paid abroad and the income on equity expanded, which led to a widening of the GDP–GNI gap overall. In the crisis years, interest paid abroad rose further on account of the higher interest rates and the quickly mounting debt, which pointed towards widening of the GDP–GNI gap, but this was offset by the falling profits of non-resident companies and the increase in current transfers from the EU.

After the crisis, as a result of the contraction in external debt and interest expenses due to dynamic hikes in the compensation of employees and deleveraging, **the GDP–GNI gap exhibited a downward trend**. Closing of the gap was slightly curbed by the rise in foreign companies' profits,[2] which increased to roughly pre-crisis levels. Subsequently, income on equity temporarily shrank, which was a huge factor in the widening of the gap, but according to preliminary actual data it rose again in 2017. This was mainly due to two effects: the reduction of the upper bracket of the corporate tax and the fact that foreign-owned companies, which mostly produce for exports, managed to generate higher profits during the economic upswing. Nonetheless, the interest balance declined in 2017 as well, as gross external debt and interest rates fell, which pointed towards the closing of the GDP–GNI gap.

With the current structure of the economy, the GDP–GNI gap is expected to widen, and therefore the income produced will increasingly flow abroad; **targeted measures to improve competitiveness are needed to reverse this trend**. The **biggest component** of the GDP–GNI gap is **FDI equity income**, which is projected to increase over the forecast horizon, resulting in further widening of the gap. Monitoring the GDP–GNI gap is also expedient from the perspective of the country's development: there is a close correlation between GDP per capita and the GDP–GNI gap (Chart 1-19).

Chart 1-19: Relationship between economic development and the GDP–GNI gap in 2017



Note: The size of the circles represents relative GDPs.
Source: World Bank.

In the case of **more advanced European countries, the difference between GDP and GNI is smaller**, and **GNI often exceeds GDP**. This is due to the fact that these countries are net lenders: they typically make sizable outbound FDI

[2] In 2014–2015 mostly linked to one-off items of a multinational corporation.

payments, for example to the Visegrád countries, including Hungary, which have a negative primary balance, i.e. are net borrowers (Balogh et al., 2018).

1.2.6 FINANCING CHALLENGES

Long-term, sustainable growth is based on **financial stability** and **sustainable financing**. **The SME sector** serves as the engine of the economy and is **extremely important** from a national economy perspective, as it plays a major role in employment and value added as well. In Hungary, 99.8 percent of companies are SMEs. Therefore, it is crucial that the SME sector be able to **utilise economies of scale and be competitive**, and **implementation of the investments** necessary for this **should not be hampered by hurdles to accessing finance**.

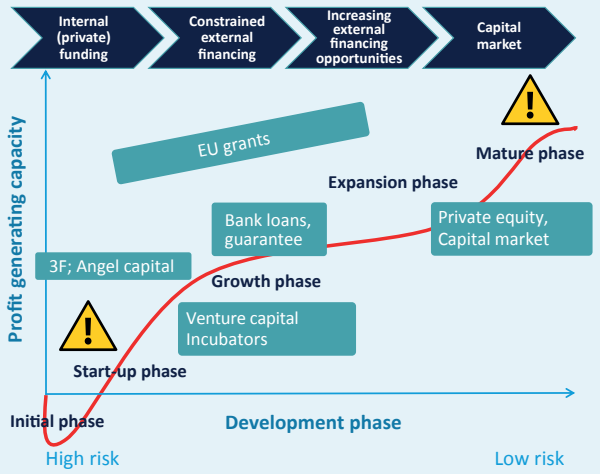
SME lending decreased after the outbreak of the crisis, but, largely due to the unconventional instruments introduced by the MNB, it then **started gradually expanding in 2015**. In 2016, the expansion of SME loans outstanding reached an **annual growth rate of 5–10 percent, which the MNB considers necessary for long-term sustainable growth**, and this is forecast to be maintained.

Consequently, SME credit growth is adequate, but its structure is not healthy enough. The **share of long-term and fixed-rate loans is low by international standards**, and it would be desirable for these types of loans to become more prevalent, so that small enterprises can finance their longer-term investments at predictable interest rates.

Credit institution and corporate surveys show **that SMEs with a multi-year credit history and a good credit rating face no obstacles in accessing finance**. However, for less creditworthy enterprises or those that have less collateral and which are thus considered riskier from a lending perspective, access to credit is still fraught with difficulties. **Institutional surety guarantees** play a major role in the funding of such enterprises, and improving the efficiency of such guarantees could probably help many risky, but viable companies to obtain loans.

It is also important that companies have **access to the appropriate amount and structure of external financing throughout all stages of their life cycle** (Chart 1-20). This is particularly true of new companies and start-ups that cannot obtain bank loans for lack of a credit history or earlier profits and due to their limited ability to provide collateral; consequently, these companies can only rely on their own funds, which may limit or slow their growth. **Alternative sources** for the necessary funding may include **raising capital**. Hungary lacks angel investors, and although there are various venture capital investors, company founders often fear losing their management and ownership control, which inhibits the acquisition of the funds necessary for growth. In the case of more mature companies, the **capital market may represent a workable alternative** to bank loans, but currently in Hungary private equity and the bond market both play a marginal role in finance. As EU funds are expected to contract after 2020, it is even more vital that the various financing channels be more firmly established.

Chart 1-20: Corporate life cycle and financing



Source: MNB.

1.2.7 ENTREPRENEURIAL SPIRIT AND RISK ACCEPTANCE

However, in order to ensure that economic growth remains sustainable in the long run, it will not be sufficient to merely avoid the demographic, economic-structure and financing pitfalls. **A psychological turnaround in society is also needed to ensure a new growth path.** The value-creating capacity of companies, the employment decisions of skilled workers and the attitude towards new technologies all depend on the choices of entrepreneurs and individuals.

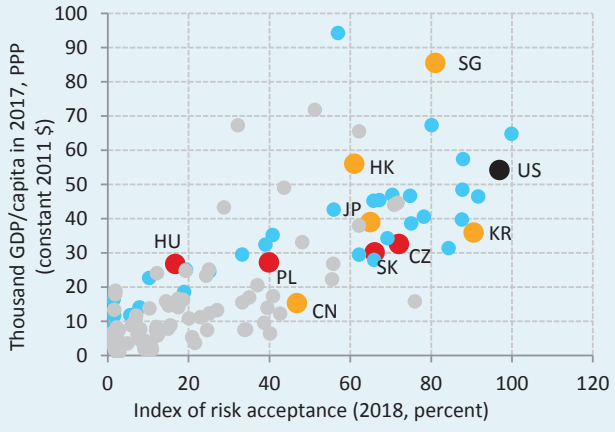
The origin and definition of the concept of entrepreneurs is uncertain. The literature usually attributes its first use to R. Cantillon who was active in the early 18th century, and it is also linked to J. B. Say who published his works in the first half of the 19th century (Madarász, 2014). Yet one of the most influential definitions was provided by **Joseph Schumpeter**, who believed that **entrepreneurs are innovators and the main contributors to economic growth** (Schumpeter, 1934/1980; Hébert and Link, 2006). The

Schumpeterian **"creative destruction"** is the engine of capitalism, where companies use resources to achieve new goals and create new products and processes, or in other words to innovate.

If the number of small enterprises or the self-employed is used to measure entrepreneurship, Europe is on par with the US and East Asia. However, adapting Schumpeter's definition to today's age, based on the number of US dollar billionaire entrepreneurs per capita, recent years' unicorn start-ups or efficient venture capital investments, **European entrepreneurship – especially in Central and Eastern Europe – lags far behind the US** (Henrekson and Sanandaji, 2017).

The primary drivers of the capital- and knowledge-intensive growth model are productive companies and the entrepreneurs that start and operate them. According to Ács et al. (2018), **entrepreneurship is determined by various factors**. These include opportunity perception, risk acceptance, networking, product and process innovation and the use of technology or venture capital. Vibrant entrepreneurship ecosystems are based on accepting the chance of failure and a determination to start anew. **Entrepreneurial culture and the innovation potential of an economy is largely determined by risk acceptance.** Compared to international standards, Hungarian entrepreneurs **reject risk-taking** and lag far behind the US and the advanced European and rapidly developing Asian countries, as well as the Visegrád region (Chart 1-21).

Chart 1-21: Relationship between entrepreneurial risk acceptance and economic development



Note: Red refers to Visegrad countries, blue to other European countries, yellow to Hong Kong, Japan, China, Korea and Singapore, black to USA, while grey to other economies.
Source: Ács et al. (2018), World Bank.

At the international level, there are several noteworthy examples with respect to society and entrepreneurship, for example China or the Nordic countries. **Entrepreneurial culture in the People's Republic of China has made great strides in the recent past**, and risk acceptance, networking and innovation are all high relative to the economic development of the country. The changes in the ecosystem are attested by the fact that in 2018 there were ten Chinese among the world's 100 richest people, whereas back in 2010 there was not a single Chinese entrepreneur ranked this high according to areppim's data.

In the spirit of Confucianism, for almost three millennia the Chinese believed that social stability was more important than individualism. The **social turnaround that started in the second half of the 1970s** provided an opportunity for the people to realise their individual aspirations and ambitions. The idea of **"to get rich is glorious"**, announced by Deng Xiaoping, brought about a sea change in society and entrepreneurship. Hundreds of thousands of new businesses were started within a year of the turnaround, and large enterprises have increasingly tried to become global. Since the mid-1980s, millions of students have learnt **English**, which further strengthens the impact of the US on China. Most of the cultural changes from recent decades are related to the **adoption of American entrepreneurial practices and social customs** (De Mente, 2009).

The social system of the Nordic countries[3] is fundamentally determined by education. Norway, Finland, Denmark and Sweden are all ranked high globally in terms of human capital (World Economic Forum, 2017). The education system of the Nordic countries is based on local values and traditions, while at the same time meeting international standards. The high participation rates and the realisation of the individual courses of development are supported by the **free education integrating a broad range of society**, the possibility and the acceptance of **lifelong learning**, and the close cooperation between educational institutions and the corporate sector (Antikainen, 2006). The low student-to-teacher ratio allows various learning styles to thrive, thereby cultivating individual development (Lakey, 2016). In Finland, the network of free, well-prepared libraries provides access to knowledge for a wide range of people and encourages the expansion of individuals' innovation capacity (Taipale, 2016).

[3] In this chapter, Nordic countries are referred to Denmark, Norway, Sweden and Finland.

1.3 Global megatrends and entry points

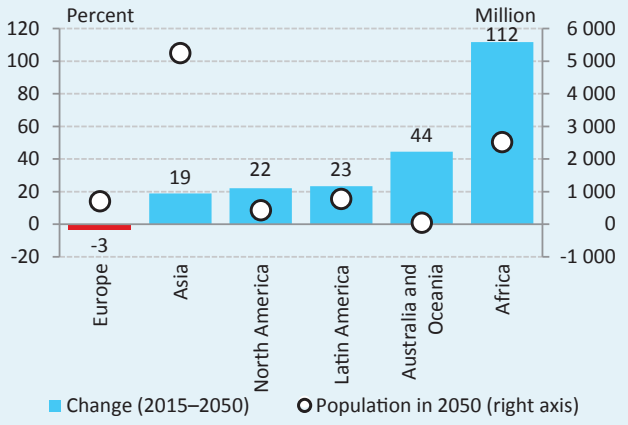
The world economy may undergo considerable transformation in the coming decades, driven by **global megatrends** such as **demography**, the **technologies of the future**, the **new phase of globalisation** and the **changing energy mix**. This subchapter focuses on the potential economic and social effects of the megatrends and identifies entry points for Hungary in the changing environment.

Taking advantage of the opportunities offered by the new megatrends may help **avoid the pitfalls** Hungary faces and **improve the productivity** of the country. Exploration of the opportunities and creation of a sound strategy, backed by rapid, efficient implementation, could help secure an advantage over the competitors and achieve sustainable economic growth in the long run.

1.3.1 POPULATION GROWTH, AGEING, URBANISATION

In the decades ahead, the **world's population will continue to grow**, **reaching 8.6 billion by 2030 and 9.8 billion by 2050** according to the UN's projection[4] (UN DESA, 2017). Most of this growth will occur in developing and emerging countries. Africa's population could more than double, while Asia's could expand by more than 800 million to over 5 billion. By contrast, the European population may fall by 2050 (Chart 1-22). While the population is generally growing in African countries, it is expected to decline in Japan, China, Germany and the Central and Eastern European region. The large-scale increase in the global population poses huge challenges in relation to the efficient use of resources, food and water security and pollution.

Chart 1-22: Change in population (2015–2050)



Source: MNB based on UN DESA (2017).

In addition to global population growth, the **ageing of societies** also fundamentally determines the world economy of the future. As a result of relatively low fertility rates and rising life expectancy, widespread ageing may be observed in all of the major regions of the world. The **share of those at or over 60 in the global population may increase** from 12.3 percent in 2015 to **over 21 percent** in 2050, and this proportion could be over 34.5 percent in Europe. While population growth mainly affects developing and emerging economies, ageing is a **general megatrend**, **affecting all economies on all continents** in the next decades (Chart 1-23).

Chart 1-23: Global ageing

Note: Light blue refers to Europe, dark blue to North America, red to Latin America, yellow to Asia, while green to Oceania. The size of the circles represents the relative population in 2015.
Source: MNB based on UN DESA (2017).

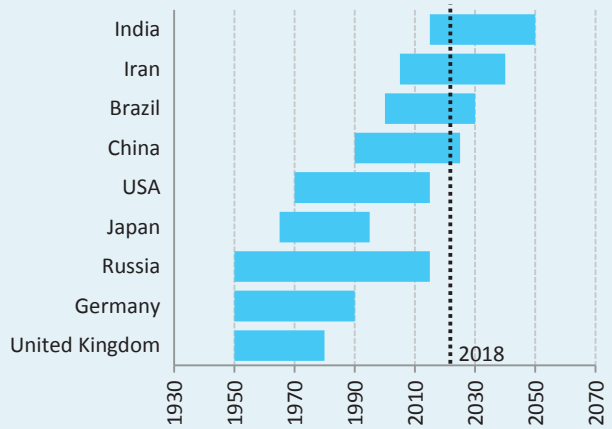
The proportion of the **working age population** (15–64 year-olds) within the total population is currently at a historic peak, but as the population ages, the decline in the share of

[4] Based on the intermediate fertility projection.

this group will lead to a continuous rise in the dependency ratio. While the ability and possibility of employment for the older generation may increase in the future, this in itself will not be sufficient to satisfy future labour demand.

Although population ageing will be a general trend in the next decades, the structure of the population varies across countries, and the so-called **"demographic window of opportunity"**[5] could fall to different periods in countries with a different development status and population. This period, which is favourable from the perspective of the share of working age population, **may have come to an end even before the turn of the millennium in advanced Western European countries**, and it ended recently in the US as well. However, despite the projected ageing of societies, **the population structure of Brazil, India and China may continue to support economic prosperity in the years ahead** (Chart 1-24).

Chart 1-24: The demographic window of opportunity



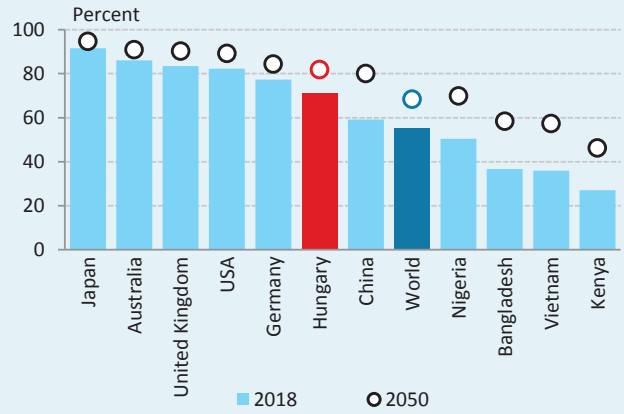
Source: MNB based on NIC (2012).

Ageing may **also affect consumption patterns through the changing structure of consumption**, and the higher old-age dependency ratio **may prove to be a challenge to the major social security systems** (pension system, healthcare). As a result, the changing social structure can **rearrange fiscal spending** (OECD, 2016).

The combination of the demographic developments analysed so far may contribute to the rise in **international and intra-country labour migration**. In advanced countries, **attracting skilled labour and preventing the outflow** of such are key to maintaining long-term economic growth. According to the OECD (2015a), the **migration of high-skilled workers across countries has soared by more than 70 percent** in recent decades. The **G20 countries are the targets** for two-thirds of international emigrants and around 95 percent of students in international higher education (OECD, 2017a). Emigration also affects the rapidly growing developing or emerging economies, as economic growth allows the young to participate in education and access to resources, but they may still decide to leave on account of the better income prospects abroad (NIC, 2012).

The other form of labour mobility driven by demographic change is migration within the country, which typically involves an increase in **urbanisation**. **By 2050, the urban population in the world may be over 6 billion**, while this figure was less than 1 billion in 1950 (OECD, 2015b). Urbanisation typically affects developing and emerging countries, where population growth is very dynamic. **The share of the urban population relative to the total population may jump to roughly 70 percent by 2050**, which is almost double the figure from the 1970s (OECD, 2012). This proportion could be over 90 percent in developed countries and is projected to rise dynamically in developing and emerging countries (Chart 1-25).

Chart 1-25: Share of urban population



Source: UN DESA (2018).

In the recent past, new cities have emerged and grown dynamically. Shenzhen turned from a fishing village in the 1980s into a megacity of ten million today (Zeng, 2010). In 1970, there were only two **megacities**[6] in the world (New York and Tokyo), however, due to the demographic trends, this figure has increased to 23 and it could be 41 by 2030 (Ernst & Young, 2016). The fast-paced urbanisation of developing and emerging countries is shown by the fact that according to the projection by Hoornweg and Pope (2014), **six of the world's largest agglomerations will be in Asia or Africa** by 2050.

[5] According to the UN's definition, it is the period when the proportion of those at or under 15 falls below 30 percent, and the proportion of people 65 years and older is below 15 percent.

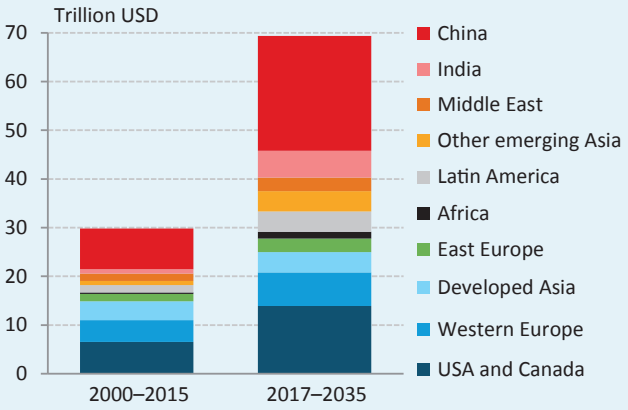
[6] Cities/agglomerations with over 10 million people.

The rapid urbanisation underscores the significance of **infrastructure, the transportation network, energy supply and waste management**, and the necessity to develop them. **New planning and operating models** are required because megacities and megaregions may span across borders and can lead to the emergence of slums in the absence of appropriate development. Urban quality of life can be significantly improved by the **"smart city"** concept, in other words the widespread use of modern technological and infrastructural developments. Efficient transportation and shorter commuting times, a cleaner and more sustainable urban environment and lower crime rates can substantially improve the quality of life in cities with growing populations (Woetzel et al., 2018).

Growing population, rapid urbanisation and the **modernisation of production** pose new challenges to the global infrastructure. Nowadays, the world spends around 14 percent of GDP on infrastructure and property development (Woetzel et al., 2017).

The amounts spent on developing the economic infrastructure[7] may increase in the coming decades, which could considerably affect the **physical infrastructure** (road, railway, port and airport developments), the **digital infrastructure** (telecommunication) and **energy supply and storage**. Although spending more on the economic infrastructure is a global requirement, **most of the new demand may come from emerging Asian countries, especially China** (Woetzel et al., 2017). In parallel with the shift between the developed and developing countries, **34 percent of global investment demand may arise in China** between 2017 and 2035, while the share of Western Europe and the US may diminish (Chart 1-26).

Chart 1-26: Investment needs related to economic infrastructure



Source: MNB based on Woetzel et al. (2017).

In addition to appropriately assessing the needs and covering spending, **improving the efficiency of infrastructure investments** is also critical in providing a mature infrastructure. Woetzel et al. (2017) estimated that **around 38 percent of global infrastructure spending is not used optimally** due to the lack of innovation, the various bottlenecks and market failures.

This low efficiency is reflected in the productivity of construction. The **labour productivity of the global construction industry** grew by 1 percent on average in the past two decades, which is significantly lower than the productivity growth rates of 3.6 and 2.8 percent registered in manufacturing and the world economy, respectively. Barbosa et al. (2017) argue that **boosting construction industry productivity to the world economy average would satisfy around half of the infrastructure investment needs**. Of course, this low efficiency is due to several parallel factors, such as widespread regulation, massive dependence on state demand, strong cyclicality, the high level of informality and corruption. However, any measure should take into account that the sector is dominated by **two main groups** with different characteristics. These are the **large companies** carrying out large industrial and residential investments on the one hand, and the **fragmented firms** that are typically **specialised** in different professions (plumbing, mechanics, electronics) on the other hand, where the shortcomings in productivity are especially pronounced.

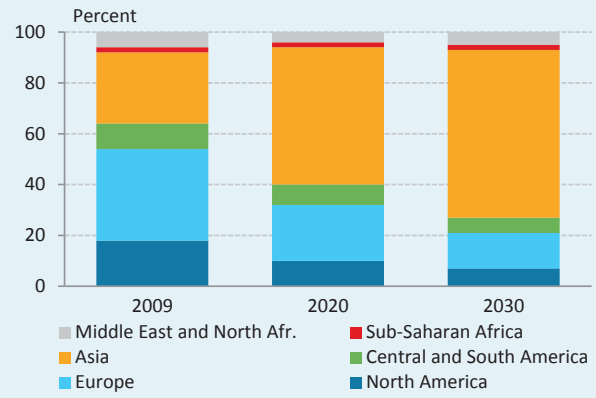
In addition to migration, the **trends can also be strengthened by the changes in family models and households**. Traditional family models are increasingly disappearing, which may be attributable to higher divorce rates, the rising number of

[7] This chapter includes claims about the economic infrastructure, and the analysis does not discuss oil and gas production, mining, the social infrastructure and the property market.

single parents, the longer time spent in education and longer life expectancy (OECD, 2016). The changing structure of households may influence consumption patterns and urban housing markets as well.

As a result of the changes in the population pyramid and rapid urbanisation, **the structure of global consumption may also change considerably** in the decades ahead. In developing and emerging countries, households' income and wealth may rise substantially, and thus the so-called **global middle class[8] could expand dynamically**, both in absolute terms and relative to the overall population. The global middle class **may expand to around 4.9 billion by 2030**, with an increase of over 3 billion as compared to 2009 (Kharas, 2010). The extent of the growth may vary across regions, with the **expansion mostly linked to Asia, especially India and China**, while the developed regions will constitute an ever smaller share of the global middle class (Chart 1-27).

Chart 1-27: Distribution of the global middle class



Source: MNB based on Kharas (2010).

Between 1970 and 2000, over half of global consumption came from the rapidly expanding population, but over the coming decades the rate of global population growth is set to decline. The middle class is a social class with viable **demand and the desire to raise its propensity to consume**, and therefore in the future global consumption growth may arise from an increase in individual expenses, in other words a **rise in per capita consumption**. Rising consumption is driven by several global social groups, most likely dominated by the **older generation in developed countries** and the **Chinese working-age population** (McKinsey, 2016).

In North America, Europe and Japan, the **consumption** of people 60 years and **older may rise significantly** by 2030, more than in the case of the younger generation. This generation is expected to spend not only on healthcare but also on travel, entertainment, food and housing. In developed countries, they are increasingly characterised by **retiring later** and **accumulating savings** to preserve their purchasing power for their golden years.

The rise of the Chinese middle class may fundamentally transform the world economy, since **this group will expand by around 100 million people** by 2030, **and its members are expected to more than double their per capita consumption**. Besides basic needs, this group may spend lavishly on clothing, dining, travel, entertainment and education. Based on the 2016 McKinsey Global Sentiment Survey, **premium brands** are appreciated the most in the world by the Chinese middle class, who are willing to spend the most on them. The role of **education expenses** should also be pointed out in the Chinese structure of consumption, as they may contribute to consumption growth more than in advanced countries, and on par with Sweden in the decades ahead (McKinsey, 2016).

The baby boom in developed and emerging countries, the ageing of societies and rapid urbanisation **present** challenges but also **entry points for Hungary** in the changing world economy. **Attracting skilled labour and preventing the outflow of such** will be a critical aspect in the decades ahead, as transitioning to higher value-added production requires an appropriate quality and quantity of production factors. As a result of the transformation of societies, **stronger participation in services** could represent an opportunity for a breakthrough. Although ageing points towards negative economic prospects in the world's countries, the demand for healthcare, personal services, travel and transportation may increase. Hungary should take advantage of its features both in traditional and modern services and use the opportunities offered by the new megatrends. With respect to traditional services, it must be noted that Hungary and the Visegrád region lie on the transit route between the developed countries of Western Europe and the rapidly developing Asian markets, which provides perfect opportunities for **tourism** and **transportation**. However, in order to harness the potential in services, **using world-class infrastructure** and **modern technological solutions** is crucial.

1.3.2 TECHNOLOGIES OF THE FUTURE

Technology is key to economic growth. According to the **neoclassical** economic theory, per capita output does not

[8] The international literature contains several definitions for the global middle class. The Growth Report follows the definition by Kharas (2010), i.e. the share of those living in households with daily per capita income of between USD 10 and USD 100 (in PPP terms).

rise in the long-term equilibrium without technological progress (Solow, 1956, 1957). The so-called **endogenous growth models** pointed out the spillover effects of accumulating knowledge (Romer, 1986) and underlined the importance of encouraging innovation, because in this framework the differences between countries' levels of development are explained by innovation capacities (Grossman and Helpman, 1991b). **Evolutionary institutional economics** also attributes great importance to technology and examines it in the economic and social system that created and popularised it (Nelson and Winter, 1982).

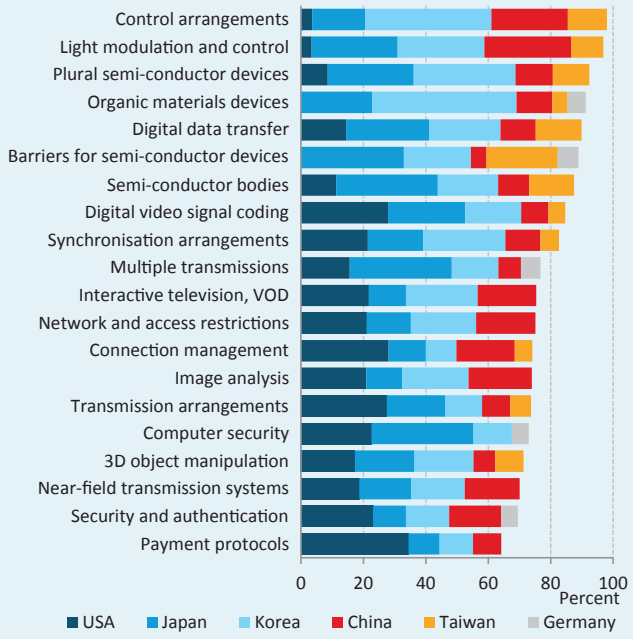
Technological change has exerted a huge effect on the development of economies over the course of history. The end of the 18th century is usually referred to as the age of the **First Industrial Revolution**, when human and animal physical energy was replaced by mechanical production based on steam and water energy. According to Landes (2003), this was the first time in history when a breakthrough led to an economy based on agriculture and manual labour being transformed into one driven by industry and machines. This was followed, at the beginning of the 20th century, by the **revolution of electricity**, which facilitated the development of the manufacturing industry as mass production and the division of labour became widespread. The so-called Third Industrial Revolution is linked to the development of **electronics as well as information and communication technology** (ICT), which allowed industrial automation to spread from the 1970s.

Today, **we are living in the age of the Fourth Industrial Revolution**, which offers outstanding new breakthroughs for the economy and society. The **spread of digital technologies and processes** may significantly influence the productivity of economies, and thus be crucial to future economic growth. Among the new inventions of our age, **disruptive technologies** are those that cause major technological progress, have a broad impact, exert a massive economic effect and can potentially change people's lives (Manyika et al., 2013). **Genetic engineering** is developing even faster than computing capacity and **advanced material technology** has also seen major breakthroughs recently. The development of **mobile Internet** is a prime example of widespread use, as that technology influences the lives of around 5 billion people. Advanced robotics can reduce global labour costs by over USD 6 billion, while the progress made in **cloud technology** can drastically increase corporate productivity and IT spending. The advances in **energy storage** may result in substantial changes to our daily lives, and **renewables** can fundamentally transform the structure of the world's energy market and energy consumption.

Disruptive technologies mainly influence the advanced economies in the short run, but may also impact developing and emerging countries through globalisation and significant spillover effects. **Participation in research on advanced technologies is highly concentrated nowadays**, both among countries and companies. The 50 largest research and development (R&D) companies account for approximately 40 percent of business R&D in the US and Canada, while the same figure is 55 percent in Germany and Japan (OECD, 2017c). **China has** significantly **improved its participation in advanced technologies**. The country's R&D spending has recently boomed and it is the second most-cited after the US based on top publications. The concentrated nature of participation in cutting-edge technologies is attested by the fact that recently **over 60 percent of patents related to the top 20 technologies were linked to six countries**, where the role of the only European country, Germany, is marginal (Chart 1-28).

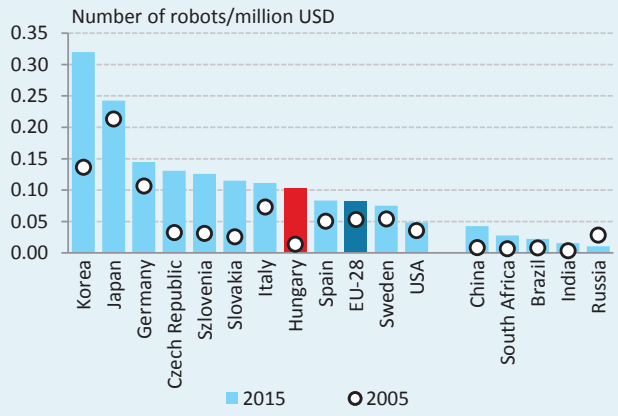
The digital transformation **does not affect economic sectors equally**. In the US, the ICT sector, media, finance and other professional services are the most digital, while mining and several manufacturing subsectors lag far behind (McKinsey, 2017a). **The digitalisation of** large **sectors** with low productivity, such as retail trade and healthcare, **holds major growth potential**. According to McKinsey (2018), the increasingly widespread use of artificial intelligence could boost the sales revenue of retail trade and the pharmaceutical industry by around 5 percent.

Chart 1-28: Top players in emerging ICT technologies (2012–2015)



Source: MNB based on OECD (2017c).

Chart 1-29: Top robot-intensive economies and BRICS



Note: Robot intensity is defined as industrial robot stock over manufacturing value-added.
Source: MNB based on OECD (2017c).

The Fourth Industrial Revolution **is transforming the traditional industries**: one of the best examples for this is the **vehicle industry**. Whereas in the past 90 percent of vehicles' value was derived from the hardware (parts, design, assembly), today 50 percent is determined by the software and the experience (Ernst & Young, 2016). In the future, the development of vehicle manufacturing will be increasingly determined by sensors, data collection and the analysis of information. Self-driving cars may also fundamentally reshape public transportation and logistics.

Technological change and globalisation have had a huge impact on the transformation of labour markets over the course of history. Robotics, artificial intelligence and the spread of the sharing economy could usher in a new era on the global labour market. Robotisation is making great strides today, and according to the projection of the International Federation of Robotics, **the number of industrial robots may double in seven years**, exceeding 3 million by 2020. Rapid robotisation can be mainly linked to the **automotive industry** and **electronics**, but may also affect other manufacturing subsectors. At the international level, **Korea** and **Japan** are spearheading the use of industrial robots, while in Europe Germany and the **Central and Eastern European region dominate** (Chart 1-29). The swift transformation of production processes is shown by the fact that the robot intensity of the countries has risen considerably in the past decade.

Robots and modern production solutions are **radically transforming modern labour markets**. Although in theory half of the world's jobs can be automated, only a portion of this can be realised in the coming decades. According to Manyika et al. (2017), **15 percent of the hours worked in the world can be automated by 2030**, which can mostly be achieved in developed countries. Even though automation leads to the disappearance of certain jobs, **the process can lead to the emergence of new jobs that may not even exist today**. The effect of automation and the **disappearance** of low-productivity and uncompetitive industrial **jobs can be offset by the relocation of industrial activities as well as the new jobs created on account of the growing significance of the services linked to industry** (Roland Berger, 2016).

Just as agricultural workers were drawn towards industry centuries ago, **technological progress may lead to a shift between jobs in the future**. According to the World Economic Forum (2016), 65 percent of the children who start primary education today will work in jobs that do not even exist yet. The demand for managers, high-skilled professionals and care providers may soar in the future, while the number of office support jobs and physical workers may plummet (Manyika et al., 2017).

The new jobs require new skills, which leads to requirements for education and training. As a result of automation and the spread of artificial intelligence, demand for physical, manual and simple cognitive skills (basic calculation and communication tasks) may drop, while **creativity, complex problem solution, social and emotional and technological skills may become much more valuable** (Bughin et al., 2018). Although automation does not equally affect the productive and service-providing sectors, **the need for new skills may**

rise across all sectors. Programming and creativity may be among the most sought-after skills in manufacturing and the retail sector.

The world has entered a new technological cycle, which could represent an entry point for the Hungarian economy. However, connecting to the advanced technologies **requires mature digital and physical infrastructure** and the **appropriate innovation capacity**. Hungary's industrial robotisation is relatively high in international comparison. However, the **challenges posed by the transformation of the labour market** and the **shift towards higher value-added in production and services** require careful consideration.

According to the analysis of the World Economic Forum (2018), with respect to the preparedness for future production, Hungary is among the group of countries where the **current industrial production is strong, but the future is surrounded by severe risks**. The shortcomings can be mainly observed in innovation. This is confirmed by the fact that future production must prepare for the **rapid adoption of new technologies and the use of new business solutions**. This is because **the spread of new technologies has accelerated** in the past decades and centuries. Steamships required around 120 years to spread, while cars and the telephone were adopted in merely 40–50 years. The technological innovations from the past decades, such as the Internet, mobile phones and MRI, became widespread in under two decades (Comin and Hobijn, 2008). Technological progress **transforms the types of enterprises** and **poses challenges to the government**, because **traditional regulation is not always an appropriate incentive** for the various sharing platforms (transportation, accommodation) and start-ups (Ernst & Young, 2016).

Higher value-added production and services depend on a modern infrastructure. Hungary must provide an appropriate quality of physical infrastructure and implement investments in digital infrastructure in parallel with technological progress. The global infrastructure can be considerably changed by trends such as the widespread use of **electromobility** or the **spread of self-driving technologies**. The global market for electric vehicles may expand dynamically in the decades ahead, and sales could increase roughly thirtyfold by 2030 (Bloomberg New Energy Finance, 2018). The establishment and development of electric charging stations and the appropriate network should also be a priority in Hungary in the period ahead.

1.3.3 THE NEW PHASE OF GLOBALISATION

The concept of globalisation varies widely in the literature, and it can denote economic, political and cultural processes. **Economic globalisation means the free flow of goods, services, labour, capital, technology and information** (Joshi, 2009). Over the course of history, globalisation has exerted a huge impact on the structure and performance of economies as well as on societies. The **First Industrial Revolution represented a turning point in global economic integration:** the spread of steam technology paved the way for the transportation revolution, which significantly reduced transportation costs. The so-called Second Industrial Revolution further strengthened this process by the rise of oil and the spread of inventions such as the internal combustion engine. **Distances shrank considerably**, ushering in a new era in global production and trade.

Although the world wars caused enormous economic damage, world trade expanded dynamically from the 1950s, despite the ideological differences. The **establishment of the Bretton Woods system and GATT (later WTO)** significantly shaped globalisation by encouraging free trade and the foreign activities of companies. **The 1990s brought about an unprecedented integration of the global economy**, which was massively driven by the assimilation of the countries formerly in the Soviet bloc into world trade and by the ICT revolution (Huwart and Verdier, 2013).

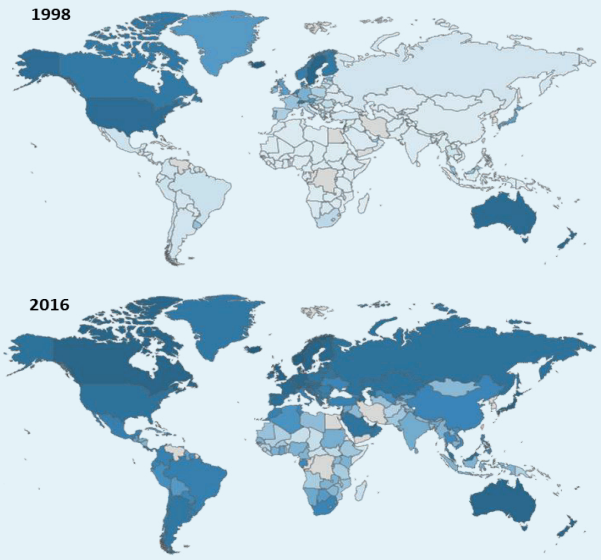
After the 2008 global economic crisis, the traditional flow of goods and services came to a halt, but this does not mean that globalisation has faltered. **The increasing flow of services and data may open a new chapter in the history of globalisation.** Although services recently accounted for merely 20 percent of world trade,[9] they represent roughly 50 percent of economic activity, and around 70 percent in developed countries. Along with technological progress and in parallel with the challenges arising from demographic developments, **services can increasingly become globalised**, which provides new opportunities for the economies, especially advanced countries in the short run.

The explanations for the relatively subdued trade in services in the recent period may include that a portion of the provision of services is heavily influenced by **cultural factors** (language, customs), **physical proximity** as well as the limited nature of **storage** and usability. However, the globalisation of services may gather pace as **digitalisation** becomes

[9] The international trade of services is difficult to measure, which can be explained by several factors: the quantification of e-commerce, recognising services related to industry in industrial products, the flow of services within companies and the secondment of staff. According to the estimate by Oliver Wyman (2013), the share of services trade may be around 45 percent.

widespread. The flow of information, ideas and innovation **may be ensured by the widespread use of the Internet**. Since 2005, cross-border bandwidth has exhibited an approximately 45-fold increase, which may further rise ninefold in the next five years (Manyika et al., 2016). The interconnectedness of various regions is attested by the fact that the **share of Internet users has experienced a boom all over the world** in recent decades (Chart 1-30). While the Internet was mostly an option in developed countries around the turn of the millennium, today it is used by over 45 percent of the world's population. In China and Russia, less than 1 percent of the people used the Internet in 1998, but this figure jumped to over 50 percent by 2016.

Chart 1-30: Share of Internet users in global population



Note: Darker shades of blue represents the higher share of internet users.
Source: World Bank.

Technological progress **integrates emerging and developing countries into the global flows** and thus into the spread of innovation and knowledge. The earlier production model based on low labour costs may be increasingly replaced by higher value-added production of goods and services, which can substantially influence productivity and wages.

Digitalisation **ensures inclusivity** not only between countries but also **between companies**. Globalisation has mostly benefited multinational corporations in the recent period. However, the spread of **digital platforms** reduces the cost of international business and trade, thereby **offering an entry point for small and medium-sized enterprises as well**. Access to global communities and markets established over the platforms is easier, and therefore these **firms can also start exporting**. The number of users on the largest social networks is now close to the number of people living in the most populous countries in the world (Manyika et al., 2016).

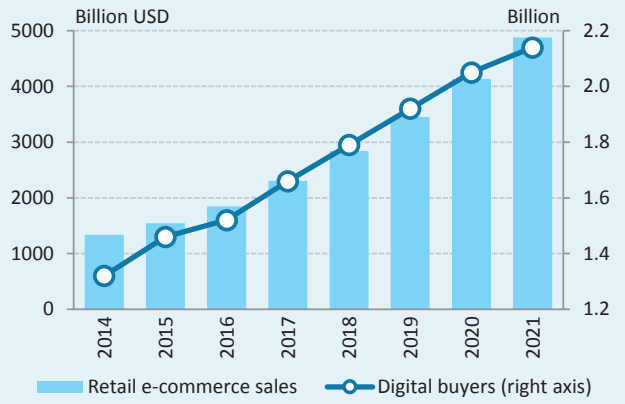
The number of SMEs that appear on digital platforms has increased dynamically in recent years, because **they can utilise the new opportunities to expand beyond their limited local markets**.

Individuals can take part directly in the new phase of globalisation. Nowadays, over 900 million people have international connections on various social media portals, over 400 million people travel abroad, 44 million people work online from another country and over 10 million people are enrolled in foreign online courses (Manyika et al., 2016).

The huge amount of potential consumers also changes the business models of companies. Reaching the customers begins with data collection, but the analysis of this information serves not only to understand their behaviour but also to influence it. However, bombarding potential consumers with daily discounts, advertisements and information is not sufficient in itself, because customers are looking for **customised products and services** (Ernst & Young, 2016). **Consumption trends have also changed** in the new phase of globalisation. Customers' needs are increasingly shifting from consumption towards the **value of experience**, as people wish to be a part of the development of the product. Moreover, security and health-consciousness are becoming more important, reducing shopping time is critical, and there is a renewed focus on personal contact (Ernst & Young, 2014).

The popularity of the new trends is shown by the **transformation of the retail sector**. Between 2014 and 2021, **e-commerce** sales may almost quadruple globally, while the number of digital buyers may also skyrocket to over 2 billion (Chart 1-31). The growing importance of digitalisation can be clearly seen in sectors such as music industry, movie industry and book sales.

Chart 1-31: Evolution of global e-commerce



Source: eMarketer.

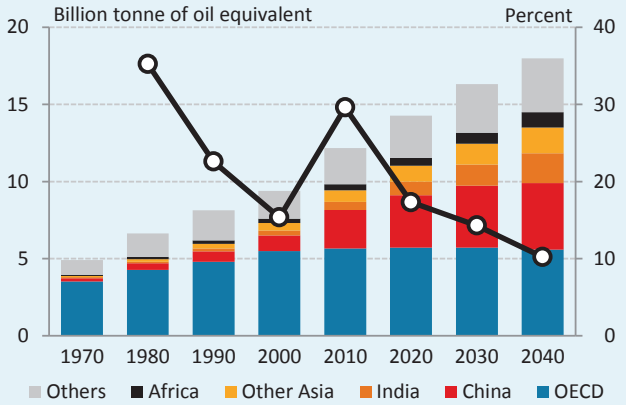
The digitalisation and increasing foreign trade of services is a global phenomenon, but its impact varies from country to country. While Singapore, Ireland and the Netherlands are ranked high in terms of the flow of services and data, emerging countries are typically less connected to the global economy. According to the MGI Connectedness Index, **Hungary** is ranked relatively high with respect to the trade in goods and the flow of data compared to its level of development, yet **there is still room for improvement in the foreign trade of services**. Digital technology offers an opportunity for Hungarian **SMEs to reach foreign markets and consumer groups**, but this requires adequate technological skills, advanced infrastructure and human capital as well as the development of the Hungarian entrepreneurial culture and entrepreneurial literacy. The key to advancing in global value chains is to **strengthen the Hungarian services sector**, which may be supported by traditional and modern service sectors alike. The **digitalisation of tourism and transportation** creates new opportunities, while a **vibrant start-up ecosystem** could serve as a catalyst for Hungarian innovation.

1.3.4 CHANGING ENERGY MIX

The expansion of the global population, the dynamic rise of the global middle class, rapid urbanisation and the change in production as a result of technological innovations all impact the **world's resources** as well. At the end of the 18th century, **Thomas Malthus** presented his theory that – because of rapid population growth –the scarcity of arable land may lead to famine and poverty (Malthus, 1798). However, as a result of the industrial revolutions and technological progress, the relationship between land and economic development changed. The great challenge of the decades ahead is to **manage the scarcity of resources** and **ensure environmental sustainability**, which also emphasises the appropriate use of technological innovations and the importance of environmental awareness.

By 2030, the world's population could reach 8.6 billion, while the global middle class could expand to 4.9 billion people, and according to a projection by Guillemette and Turner (2018), the world economy may grow by over 3 percent on average annually. Owing to social and economic needs, the **world's energy demand may continue to rise in the coming decades**. Global energy use rose by over 90 percent between 1970 and 2000. Although the growth rate may decelerate to below 50 percent between 2010 and 2040, the continuing increase in energy needs and their realignment across regions poses a challenge. In the coming decades, **the growing energy use may be mainly linked to Asia, especially China and India**, while it may be relatively stable in the developed countries (Chart 1-32).

Chart 1-32: Evolution of global energy consumption

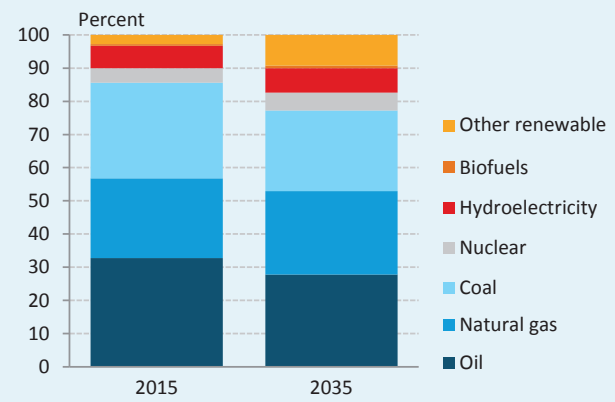


Note: The line chart presents the change in energy consumption on the right axis.
Source: BP Energy Outlook 2018.

The growing global energy needs are principally explained by the **expansion in the use of electricity**. According to the International Energy Agency (2017), industrial electric motor systems account for around one-third of demand, and as incomes rise, households' demand for consumer electronics, for example the various smart devices and heating/cooling equipment, will also expand. The **burgeoning Asian middle class** will generate viable demand that may cover their greater food and shopping needs. According to Dobbs et al. (2011), per capita calorie intake in India may grow by 20 percent in the next two decades, while meat consumption per person in China may rise by 40 percent annually. The **revolution of e-mobility** may also influence energy use and the developments in the energy mix in the decades to come.

Energy use will increase, albeit at a diminishing rate, and therefore an **adequate amount of energy must be produced with a sustainable structure**, and **energy efficiency** needs to be substantially improved. Although the various long-term projections vary with respect to how the global energy market will develop, they all agree that the **significance of renewables will grow in the decades ahead**. According to BP's forecast, the **share** of renewables (water, biofuels, other renewables) **may increase by over 7 percentage points** by 2035, while the proportion of coal and oil may decrease in energy production (Chart 1-33). However, new investments are needed for **the energy mix to change**. In the European Union, 80 percent of the new capacities may be linked to renewables, and wind energy may become the primary source of electricity after 2030 (International Energy Agency, 2017).

Chart 1-33: Decomposition of global energy production



Source: BP Energy Outlook 2017.

Besides the provision of supply, the issue of **energy efficiency** is also crucial. According to Dobbs et al. (2011), roughly one-third of the efficiency potential can be harnessed by increasing the **energy efficiency of buildings** and the **economies of scale of large-scale farms** and reducing **food waste**. Changing the energy use of the main economic sectors is vital for boosting efficiency. Based on the projection of McKinsey (2017), **energy intensity is set to decline** in the decades ahead, mainly due to the lower energy use for the lighting of buildings and of passenger cars and trucks. Raising energy efficiency is mainly possible in **developing and emerging countries**. In parallel with the rising demand for energy, China's commitment and regulation are critical. As a result of the shift in economic structure towards services and the expected active role in e-mobility, average annual Chinese energy consumption growth is projected to fall to around 1 percent by 2040 (International Energy Agency, 2017).

Considering sustainability is vital when analysing the economic and social developments of the decades to come. Energy demand and efficiency represent a major challenge of our age, since providing the ever-growing population access to sufficient energy and the changing production structure calls for a new and sustainable energy mix. **Identifying the trends and harnessing the opportunities** are critical for Hungary as well. Managing energy efficiency at the household, company and state level as well as **diversifying** Hungary's **energy use** and aligning it with the production structure of the future are pressing issues for Hungary, but also for the CEE region.

Conclusions

2010 marked the end of procyclical economic policy in Hungary, which had sacrificed macroeconomic stability for short-term growth prior to the crisis. **Real economic convergence was achieved in recent years in parallel with maintaining macro-financial equilibrium.** However, **the convergence process may run out of steam** with the currently available technology and the quantity and quality of human resources. Economic policy needs to **find new ways** to foster economic growth.

It is **crucial to address the problems** faced by the Hungarian economy in order to achieve sustainable convergence. Demography may increasingly place a constraint on convergence, and the competition for skilled labour has become global. In addition to providing a sufficient quantity and quality of human capital, other aspect which are also critical for Hungary include raising the value-creating capacity of the economy, boosting the productivity of the SME sector and addressing the financing, income and social traps.

New global megatrends have appeared or strengthened in recent years and these may **serve as entry points for Hungary**. The ageing of society, the dynamic expansion of the Asian middle class and rapid urbanisation may shake up global income and consumption patterns. The world has entered a new technological cycle: achieving greater value-added in production and services requires that modern technological innovations and processes be employed, and that the physical and digital infrastructure be developed. Nowadays, services are provided globally: they are not bound to a geographical location thanks to the widespread use of the Internet, which may offer new opportunities for the Hungarian SME sector to tap into foreign markets. Moreover, the changing global energy mix shifts the focus to sustainability and environmental considerations. The new

megatrends may offer opportunities to achieve economic convergence over the long run, while simultaneously maintaining equilibrium and addressing the pitfalls faced by the Hungarian economy. Using these opportunities may contribute to **boosting the productivity of Hungary**.

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2 The macroeconomics of convergence

The fundamental political and economic goal of national economies is to create and increase social welfare, which requires stable economic growth. One important question is what the main driving forces of development are. Economies that have already had successful growth periods in the past can serve as empirical examples for emerging economies. Development is important not only in terms of economic considerations, but also for the individual. Development, rising standards of living and 'living as well as possible' are basic human needs and goals. Comparison with developed economies is important as they are the real examples of an attainable high standard of living.

In the history of economics, various growth models were created to examine growth. The common goal of these tools is to describe convergence processes and help understand them. As with any model, these growth models also have strengths and weaknesses. At the same time, the models have often provided a consistent conceptual framework for economists to answer a specific question. The objective of all models is to examine the growth of economies and to explore, analyse and understand the underlying driving forces.

Following World War II, by the 1950s, stable economic growth was observed in the world in general and a wealth of data was available for the wider analysis of growth. This period saw the creation and spread of the neoclassical growth theory, which primarily concentrated on the relationship between the factors of production and output of economies, focusing on how much a certain economy was able to potentially produce. This, in turn, depended on the factors of production, without being influenced by aggregate demand. Their main relationship is the so-called production function, which was applied as a general production function for the economy, and which described how much output was achievable from the various combinations of the different factors. As time passed, the models continuously expanded along various concepts. One of them was that, in addition to the traditional capital and labour as factors of production, human capital was also directly included in the production function. The importance of human capital is unquestionable nowadays; most economic progress, innovation and development is ultimately provided by knowledge, and increasing knowledge means sustained economic growth.

One key question of growth theory is whether the differences between poor, middle-income and rich countries will ever cease to exist. Based on this approach, two basic types of convergence (absolute and conditional) are distinguished. According to absolute convergence, income disparities between countries will disappear sooner or later. Irrespective of any other factors (e.g. production possibilities, economic policy), economies are heading towards the same level of development in the long run. Based on data from past decades, this theoretical approach cannot be corroborated at all. According to conditional convergence, not every economy is automatically heading towards the same level of development, only ones with similar characteristics. This is exactly what neoclassical growth models claim: over the long term, economies with identical fundamentals will reach the same level of development, irrespective of where they started from. It is important to note here that at the same time the so-called endogenous models do not contain convergence to the developed economies, as there is no mechanism in the model that would decelerate a developed economy. This means that the ceasing of initial income disparities is not guaranteed on the basis of these models.

According to our opinion, a more balanced approach describes the convergence characteristics. In this case, not only consider the basic fundamentals of the economy, but also the current level of development. In this type of path dependency, different stable situations arise at different levels of development. If an economy starts from a lower level of GDP per capita, but its growth gradually cools off, it becomes trapped. What state it arrives at also depends strongly on the initial income level. In the case of lower-income economies, it may even mean getting stuck in the poverty trap. In their case, it is important to set up an adequate institutional system, integrate into global trade and adopt more developed foreign technologies. In the case of Hungary, it is more important to compare the middle-income trap and the state of equilibrium of developed economies, which is discussed in more detail in this chapter. A middle-income economy can transition over to another convergence path towards developed economies with significant technological advances, innovation and substantial human capital development.

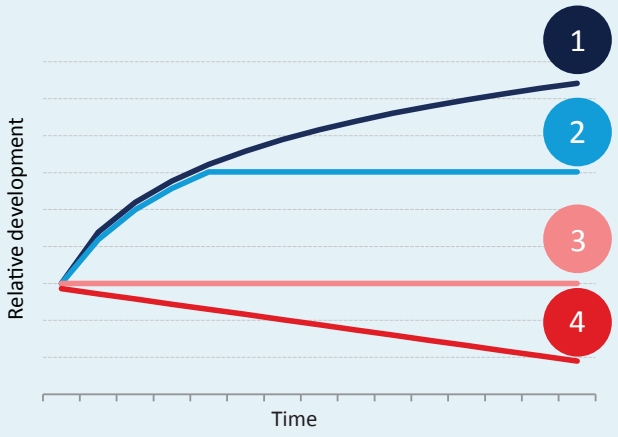
Introduction

For an economy that is not yet in a developed status, it is extremely important how – if at all – convergence with the standard of living of developed economies takes place. This is essential not only in terms of economic considerations, but also for the individual. **Development, rising standards of living and 'living as well as possible' are basic human needs and goals.** Comparison with developed economies is important as they are the real examples of an attainable high standard of living. In our report, the level of development is analysed in comparison to Austria, which is one of the most developed and geographically closest countries to Hungary. Our macroeconomic projection is detailed in the next chapter, while this section provides an overview of the theoretical and empirical results of growth models and convergence.

For economists, it is important to continuously deal with the above aspects and monitor economic developments. How is it possible and expedient to do so? There are various ways of measuring welfare. One is to examine per capita consumption and compare it with the corresponding indicator in developed economies. This is important and useful, but paints a different picture of the economy as a whole, as it only takes consumption into account and disregards, for example, the export sector or the investment performance of economic agents. A wider **indicator that takes into account the comprehensive situation of the economy as well as the performance and state of all sectors is the change in GDP per capita**.[10] Accordingly, this statistic is considered the main indicator in our analyses.[11]

The macroeconomic path of developing national economies can be divided into four basic groups in certain periods (Chart 2-1). One group consists of the economies that achieve persistent, continuous economic development with unbroken real economy convergence. Another path is where convergence takes place for a while, but fails to continue after a certain level and gets stuck. The third and fourth ones constitute the non-converging group. Although the level of development of the former does not rise, it does not worsen significantly either, while in the case of the latter group the relative GDP per capita declines. A country's membership of a group may even change over longer periods of time,[12] and thus the grouping represents the countries' convergence path, rather than the countries themselves.

Chart 2-1: Stylised chart of possible developments in catching up



Note: 1: Increasing level of development, 2: Increasing level of development with stopping, 3: Unchanged relative development, 4: Declining relative development.
Source: prepared by the MNB.

Over its history, Hungary has belonged to different groups. Perhaps one of the most important economic policy questions is whether Hungary's convergence, which has restarted in a balanced manner in recent years, will be able to persistently remain in group 1. **The main subject of the Growth Report is the macroeconomic goals that are needed to achieve this.**

The fundamental political and economic goal of national economies is to create and increase social welfare. This requires stable economic growth. In growth theory, an important question is what factors growth stems from and what the main driving forces of convergence are. Economies that have already had successful growth periods in the past serve as empirical examples for emerging economies.

The analysis of growth is a priority area of economics; accordingly, numerous growth models have been created in the history of economics.[13] The common goal of these tools is to describe convergence processes and help understand them. Another common feature is that unfortunately none of the models is able to provide a set recipe for economic policy for the implementation of successful convergence. Nevertheless, the conclusion that can be drawn from empirical experiences is that **the economies that achieved successful convergence were characterised by the application of developed technology and by high productivity**. Accordingly, the ultimate economic policy recommendation is to focus on these factors.

[10] It should be mentioned, however, that the methodology of measuring GDP has been a subject of debate among economists and statisticians for a long time. We dealt with the difficulties in more detail in Chapter 4 of last year's Growth Report.
[11] There are also many other alternative indicators to measure welfare (e.g. Human Development Index, Happy Planet Index, Environmental Performance Index, Ecological Footprint; see Szigeti, 2011), but in economics, GDP per capita is the generally used indicator, so this is what we also use.
[12] A good example for this is Chile. In the 1900s it mostly belonged to group 4, while in the past 25–30 years it tends to show a path belonging to group 1.
[13] Below is a concise summary of the individual models; concerning other models and for a more detailed description see e.g. Bessenyei (1995).

The following presents a brief overview of the theory of growth models and their practical application concerning convergence analyses.

2.1 Growth models

Following the Great Depression and then World War II, by the 1950s, stable economic growth was observed in the world in general. This period saw the creation and spread of the **neoclassical growth theory**, which primarily focused on the relationship between the factors of production of economies and output.[14] The theory concentrated on how much a given economy was able to potentially produce. This, in turn, depended on the factors of production, without being influenced by aggregate demand.

Their main correlation is the so-called production function, which was applied as a general production function for the economy as a whole, and which described **how much output was achievable from the various combinations of the different factors**. For this, a typically very easy-to-handle and easy-to-interpret form of function was used, the so-called Cobb–Douglas production function:[15]

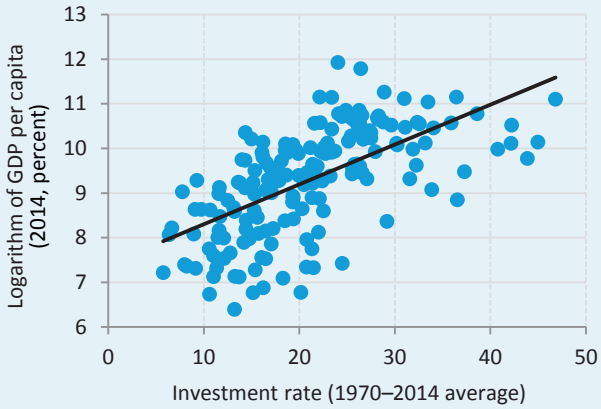
$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha},$$

where Y_t is output, A_t is the level of general technological development, while K_t and L_t are the available capital stock and labour, respectively, and α is the partial production elasticity of capital. **The main feature of this approach is that while capital and labour are factors of production competing with one another** (e.g. a certain labour input can only be employed by a certain company at a certain time), technological development is practically available for and can be involved in production by any company. Another important feature of the production function is the law of diminishing returns, i.e. if only one of the competing factors of production is increased (i.e. either only the labour or only the capital), total output will rise only to a lesser extent than that. By contrast, on the basis of the above formula, a **rise in the technological level raises output proportionately**. **Accordingly, general technology has a special role compared to other factors of production.** In the case of the other two factors, the law of constant returns to scale can be interpreted for capital and labour jointly: if both capital and labour are doubled, output will also double.

By applying the production function,[16] Solow (1956) **presented what portion of the increase in output is explained by changes in individual factors**.[17] Knowing the increases in output, capital and labour as well as α, it is possible to calculate the so-called Solow residual. This is the impact that cannot be explained from the increase by the changes in labour and capital as factors of production. These include, for example, technological progress, capacity utilisation, labour quality and all other factors that have an impact on growth. It was found that capital accumulation explains a relatively small part of economic growth. Accordingly, explanatory variables other than these factors are more important.

In addition, one of the conclusions of the Solow model[18] is that **per capita output will be the highest in the country where the investment rate is the highest**. This can be corroborated empirically; a positive correlation is observed between the average investment rate over several decades and GDP per capita (Chart 2-2). At the same time, the model underestimates the impact of the savings rate. Mankiw et al. (1992) estimated the elasticity according to the savings rate for GDP per capita on various samples and received a significantly higher value as a result than the one following from the Solow model.

Chart 2-2: Correlation between investment rate and per capita GDP



Source: PWT.

[14] This process was facilitated by the fact that by this time the so-called system of national accounts was created, which was an important source of data for analyses.

[15] A consequence of this form of function is that capital and labour can be substituted in a one-to-one ratio. Another often used – although more difficult-to-handle – form of function is the so-called CES (constant elasticity of substitution) function, in which already a parameter other than 1, but constant in time can also be applied.

[16] For doubts related to the production function see, for example, Box 1-1 by Briglevics et al. (2016) and Chapter 2.1.1 by Ábel et al. (2016).

[17] At the same time, the model is unable to properly estimate income ratios.

[18] Also known as Solow–Swan model, although in practice mostly Solow's name is used; he developed the original initial model.

The conclusion of the Solow model is that a less developed country will certainly catch up with a developed one if they have identical economic fundamentals. The result is related to capital accumulation. Accordingly, the poorer country has lower capital, and thus the yield from capital growth is greater there, i.e. it can attain faster growth and thus inevitably catches up with the more developed country. **However, examining a wide range of countries, as seen before, this is not true.** In addition, in the Solow model, economic agents always use the same proportion of the income for capital accumulation, but empirically this cannot be proven.

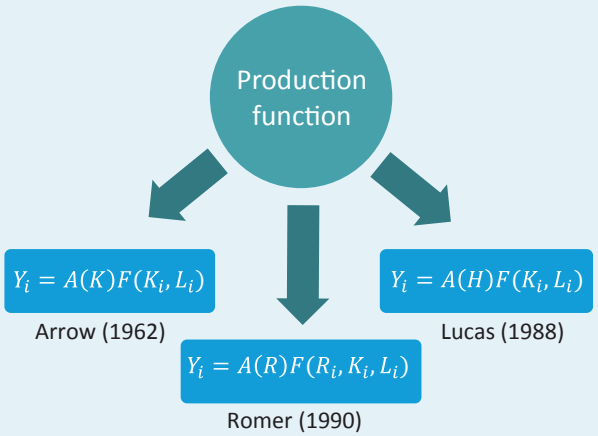
This latter problem is handled by Ramsey (1928), Cass (1965) and Koopmans (1965), in whose case the savings rate is already not exogenous and not constant, but is **endogenous on the basis of the consumption–savings decision. Economic agents decide on the degree of capital accumulation in a rational manner**.

Accordingly, an important difference is that while the savings rate is constant in the Solow model, in these models it becomes constant only in steady-state and changes over the short run. The Solow model does not explain the changes in the savings rate as it treats the latter as exogenous. In the Ramsey model, however, the movement of the savings rate can also be explained. The savings rate fundamentally depends on the consumer's so-called personal discount factor. This means that if **a household prefers relatively much more the future, it saves more**. On the other hand, let us take, for example, the beginning of the convergence period. Let us assume as an example that we start from a lower capital stock than that of the long-term equilibrium. In this case, the marginal product of capital is high, i.e. a higher yield can be attained from additional capital accumulation (investment), and thus it is worth it for the household to save more.

This model is also a neoclassical basic model, and although its short-term dynamics are different from the Solow model (due to the endogenous savings rate), its long-term conclusions are not significantly different. Accordingly, poorer countries are able to catch up with developed economies sooner or later, provided that the conditions are identical. However, empirically it cannot be corroborated as generally valid.

Another difficulty is that **the Solow model does not say anything about the nature of technological growth itself**. **This is the problem that endogenous growth models attempted to address.** In the case of these models, the underlying idea is that the technological level is no longer an external condition, but a variable that depends on other explanatory variables, mainly on the decisions of economic agents. Various models exist. Usually, three basic ones are distinguished (Chart 2-3), but the main mechanism is similar.

Chart 2-3: Corporate production functions applied in endogenous growth models

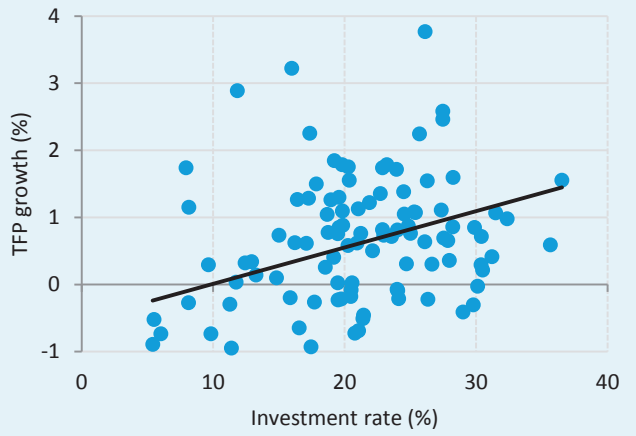


Note: Index i indicates the individual companies, Y is the production, A is the technology, F is the production function, K is the capital, L is the labour, H is the human capital and R is research and development.
Source: MNB compilation based on Varga (2009).

Arrow (1962) considers 'learning by doing' the basis of technological development, and thus in his case the level of aggregate capital stock influences the technology. According to Lucas (1988), development of human resources and investment in them increases human capital, and this as well as the resulting knowledge spillovers develop technology. Romer (1986) and Romer (1990), however, highlighted the importance of research, so in his case corporate R&D and research results appear in the aggregate production. Varga (2004) emphasises the same and also calls attention to the importance of research at universities.

For a simple demonstration of the above, let us take the case that the value of production technology is determined by the capital stock available in the economy. This means that if **a company implements investment, it not only increases the capital stock directly, but it also raises the technological level indirectly**. The intuition behind this is that the knowledge and experience accumulated during previous investment projects and activities add to productivity later. A collective examination of several countries leads to the conclusion that there is a positive correlation between investment rate and total factor productivity (Chart 2-4).

Chart 2-4: Correlation between investment rate and TFP growth



Note: The individual values are average values as of 1990.
Sources: PWT, MNB calculation.

Accordingly, a feedback process takes place in these models. Investment raises the level of capital, but as a result, the level of technological development rises, which increases the productivity of capital, encouraging further investment. This approach may be understood as the description of the R&D sector, but its modelling in this form in Romer's (1986) study is, of course, extremely simplified. Subsequent models handled this sector in a more detailed manner.[19]

Romer (1990) thinks that the assumption that knowledge is available for the community as a whole is wrong. **As a result of the patent system, new discoveries are protected, and thus companies have monopolistic power, which provides higher profit for them.** Therefore, Romer switched over from perfect competition to monopolistic competition, relying upon the model of Dixit and Stiglitz (1977). In addition, a so-called knowledge production equation describes how the aggregate stock of ideas evolves over time:

$$\Delta A_t = \theta H_{A,t} A_{t-1},$$

where t indicates the time index, $H_{A,t}$ is the human capital working in knowledge production, which can be identified with the number of researchers or engineers working in the industrial sector, while A_t is the level of ideas accumulated during history (in books, studies, patents) (and ΔA_t is its change), and θ is the productivity parameter. **Accordingly, the increase in knowledge is determined by the number of researchers**, although how much new knowledge is created depends greatly on the level of accumulated knowledge as well. On the equilibrium path, the increase in technology determines economic growth as well, which equals the growth in knowledge. Accordingly, in the long run, the number of researchers determines growth. **Examining empirical data, Jones (1995) found that this assertion is not in line with the facts. According to his finding, knowledge production depends on the change in the number of researchers**, i.e. the law of diminishing returns prevails here as well.[20]

In addition, relevant institutions also play an important role in economic growth: Acemoglu et al. (2002) **empirically verified the impact of the institutional system on growth**. According to their analysis, in the examination of the differences in economic performance across countries the explanation is that an adequate institutional system supports economic growth.

Accordingly, as we have seen, the importance of human capital is also unquestionable nowadays; most of the economic development, **innovation and development are ultimately provided by knowledge, and increasing knowledge means sustained economic growth**. Jánossy (1966) already called attention to the importance of human capital, but Mankiw et al. (1992) proved its importance empirically as well.[21] Human capital is discussed in more detail in Chapter 5. of the Report.

2.2 Convergence types

One of the key questions in growth theory is whether the differences between poor, middle-income and rich countries will ever cease to exist. Based on this approach, two basic types of convergence are distinguished, the conclusions of which may be important for economic policy:

- According to **absolute convergence**, the differences in income between countries will disappear sooner or later. Irrespective of any other factors (e.g. production possibilities, economic policy), economies are heading towards the same level of development in the long run. Based on data from past decades, this theoretical approach cannot be corroborated at all.

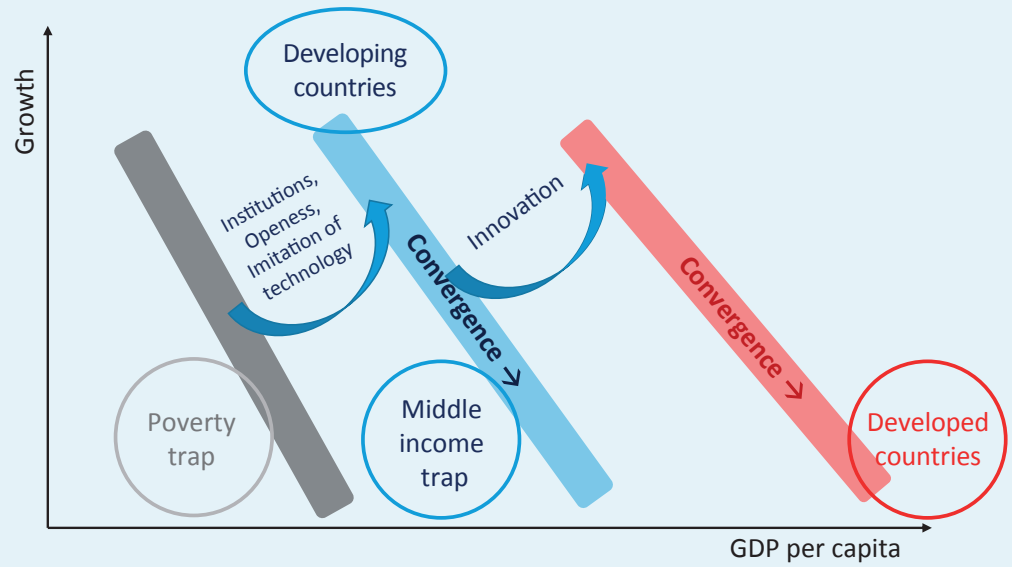
- According to **conditional convergence**, not every economy is automatically heading towards the same level of development, only ones with similar characteristics. **This is exactly what neoclassical growth models**

[19] Without attempting to be exhaustive, e.g. Romer (1990), Acemoglu and Zilibotti (2011).
[20] The finding of Bloom et al. (2017) is similar.
[21] For example, Mincer (1958) and Schultz (1961) were also among the first who dealt with the theory and importance of human capital.

claim: over the long term, economies with identical fundamentals (e.g. factors of production, preferences, economic policy) will reach the same level of development, irrespective of where they started from. It is important to note here that endogenous growth models do not contain convergence to developed economies, as there is no mechanism in the model that would decelerate a developed economy. This means that the disappearance of initial income disparities is not guaranteed on the basis of these models.

system, integrate into global trade and adopt more developed foreign technologies. In the case of Hungary, it is more important to compare the middle-income trap and the state of equilibrium of developed economies, and accordingly this is discussed in more detail below. Before becoming stuck in a trap, a middle-income economy may be able to transition to another convergence path towards developed economies through significant technological development. **Accordingly, innovation is a key issue for middle-income economies.**

Chart 2-5: Stylised chart of states and transitions



Source: Based on ITO (2017).

In addition to the above, so-called club convergences are also often mentioned,[22] according to which various clubs come into being: countries with similar fundamentals and starting levels move towards the same level of development. This means that not only similar characteristics are important, but the current/initial state as well. Accordingly, on the whole, an economy that starts from a very low level is unable to completely catch up with the most developed one, i.e. income disparities will never disappear in the world as a whole.

These considerations lead us to the so-called multi-equilibrium approach. Chart 2-5 presents the various states and equilibria. GDP per capita and the rate of growth are measured on the horizontal and vertical axes, respectively. If an economy starts from a lower level of per capita development, but its growth gradually cools off, it becomes trapped. What state it arrives at also depends greatly on the initial income level. In the case of low-income economies, it may even mean getting stuck in the poverty trap. In their case, it is important to set up an adequate institutional

2.3 The middle-income trap as an undesirable steady state

What is this trap? Various studies address the middle-income trap. There are several possible approaches to determine which country is considered as a middle-income country. The World Bank's breakdown by income groups is used most often. A key question in these studies is why a middle-income country is unable to grow further. Agenor (2016), for example, provides a good summary. Several factors can be identified among the reasons:

- According to **the law of diminishing returns on physical capital**, initially the GDP-increasing effect of investment is higher, but later its contribution declines steadily.

[22] For more details on the various convergence types see Galor (1996).

According to Eichengreen et al. (2012), however, capital is less responsible for the deceleration of a country's growth; in their opinion, it is typically related to the slowdown in total factor productivity.

- **Remaining in the middle-income trap can also be caused by short-sighted approach**, i.e. in the short run, it is much cheaper to imitate others instead of innovating. Although this increases income in the short run, it does not stimulate investment in education, which is the basis of innovation and thus of long-term growth.

- **Poor-quality human capital** prevents the country from adopting more advanced technologies from abroad and contributing to innovation.

- **Unsuccessful incentives and incorrect allocation of capabilities.** If in a country, capable people who are apt for innovation activities choose another sector, it smothers the possibility of innovation.

- **Lack of access to advanced infrastructures.** There are two groups of infrastructures. The first one, i.e. basic infrastructure, means roads, electricity and basic telecommunications. The second set of advanced infrastructures comprises advanced information and communication technologies. Lack of the latter may be an obstacle to further development.

- **Lack of access to finance.** Innovative companies mainly have intangible assets, which are difficult to consider as collateral for creditors. On the other hand, they do not want to make their innovation public for others, and they try to protect it. These processes strongly hinder the companies concerned. In addition, the limited amount of information and the higher risk expected of the creditor entails higher interest rates as well. Moreover, these firms are typically young, small enterprises, for which borrowing is more costly anyway.

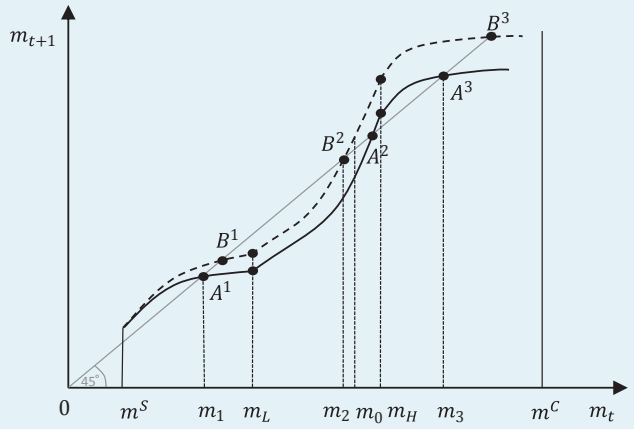
- **Income disparity.** In the early stages of economic development, the price of rapid growth is income disparity. However, when a medium level of development is reached, income disparities start to decline as a result of education and continued industrialisation. Nevertheless, while income disparities are significant, they hinder development, because access of the less well-off to vocational training is more limited.

Agenor and Canuto (2015) analysed the middle-income growth trap in an overlapping generations model. **Two groups of workers are distinguished**: average workers, who do simple jobs and thus participate only in the production of final products, and above-average workers, who can continue their studies if they want to. As a result, they can acquire special knowledge, with which they can work in the innovation sector. However, to make them want to invest in education, wages need to be relatively higher in the innovation sector than in the other sectors.

The authors find that **the key to the convergence of an economy is the innovation sector**. **The underlying reason is that labour productivity is the highest in this sector.** The higher the number of people who work there, the more dynamic growth is. Whereas in other models the marginal productivity of knowledge or ideas is constant or diminishing, in this model it is increasing in one section. On the one hand, this is explained by the nature of knowledge, while on the other hand, in the case of developing countries the phenomenon of 'learning by doing' is more typical of the innovation sector, i.e. participants learn the processes as they are doing them.

Understanding the findings is facilitated by Chart 2-6, which shows the changes in the knowledge-to-capital ratio (m) from one period to another (continuous curved line). It can be divided into several sections. In the first section, between m^S and m_L, the productivity of knowledge is low. In the second section, between m_L and m_H, productivity grows as a result of increasing knowledge and thus as a result of the network externality inherent in knowledge (e.g. Internet). However, as its level exceeds a threshold, m_H, network externalities become utilised, and productivity settles at a low level again. The minimum value of the knowledge-to-capital ratio is m^S when people who work above the average do not wish to work in the innovation sector. And the maximum value is m^C, when everybody would like to work in this sector. There is a balance when the knowledge-to-capital ratio remains at an unchanged level. The various equilibria are determined by the points of intersection of the curve and the 45-degree straight line. If we are above the 45-degree straight, the knowledge-to-capital ratio increases from one period to another, while if we are below it, the ratio declines.

Chart 2-6: Escaping from the middle-income trap



Sources: Agenor and Canuto (2015), MNB compilation.

A^1 and A^3 are different stable equilibrium points. **Point A^1 is defined by the authors as the middle-income growth trap, where a low knowledge-to-capital ratio is coupled with low growth.** Its opposite is the A^3 equilibrium, where a high knowledge to capital ratio entails high growth. However, the second equilibrium, A^2, is not a stable point; therefore, if the knowledge-to-capital ratio is lower than m_2, on the basis of the model we arrive at the A^1 equilibrium, rather than at point A^2. If, in turn, we are above m_2, we arrive at A^3.

To illustrate exiting from the status of medium development, let us assume that initially the economy is at the m_0 knowledge-to-capital ratio. **Without economic policy measures, the model would converge to point A^1, and the economy would become stuck in the status of medium development.** By contrast, for example as a result of high-volume investment and development in advanced technologies, the curve of the knowledge-to-capital ratio shifts upwards and becomes the dashed curve. Until now the economy was to the left of equilibrium point A^2, but now it shifts to the right side of B^2. As a result, the processes no longer pull the economy into the middle-income trap, but propel it instead towards a higher growth path (B^3).

The most important question for Hungary is, of course, how it is possible to escape from the middle-income growth trap or to avoid being trapped. As **the middle-income growth trap** is also a state of equilibrium,[23] **exiting it is not possible with small steps, as major measures are needed. In the case of Hungary, this means competitiveness reforms in the coming period**.

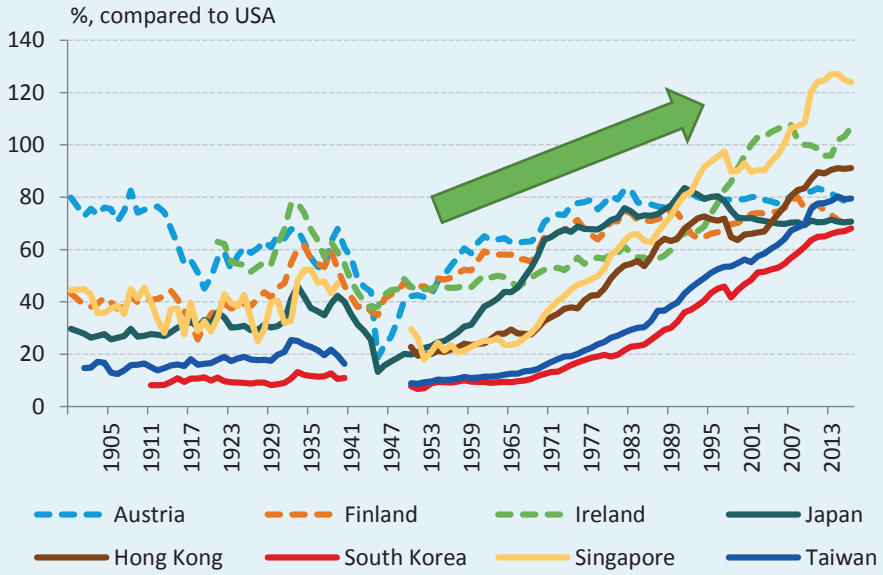
Accordingly, this may be the key thrust of economic policy in the coming decade and more. The main question is whether the Hungarian economy is able to move on a growth path that leads to a higher level of development over time. **Looking ahead, high growth rates will slow down, but it does matter at what level of development this occurs.** If competitiveness reforms are implemented, Hungary will embark on a path of catching up with the developed economies (Chart 2-5, red band). However, if reform measures are not taken, the currently high growth may come to an end, and Hungary may find itself stuck in the middle-income growth trap: the economy may stabilise at a lower level compared to developed economies (Chart 2-5, blue band). **Consequently, reform measures are needed in order to avoid this trap.**

[23] Although this conclusion is disputed by many, there are people who consider it a transitional stage rather than an equilibrium, including, e.g. Shekhar et al. (2018). At the same time, many economies are able to stay in a status of medium development for a longer period of time, and thus it can be considered much more a state of equilibrium (although it is undoubtedly undesirable).

Box 2-1: Medium level of development: a trap that can be avoided with a comprehensive turnaround in competitiveness

If reform measures are not realised, the Hungarian economy may remain in the current state of medium development, i.e. Hungary's relative development would not change significantly in the future. This state is called the middle-income (growth) trap. Based on international experience over several decades, it can be established that it is difficult to break free from this and exiting the trap is not automatic. Over the last more than one half century many more economies were unable to escape the trap than were successful in catching up. Of the European countries, Austria, Ireland and Finland belong to this latter group: their economic performance was steadily improving for nearly 20 years (Chart 2-7). The Asian Tigers also belong to this group. Hong Kong, Taiwan, South Korea and Singapore have shown very significant, strong economic expansion for a long period. From the 1960s until the early 1990s Japan also achieved dynamic growth.

Chart 2-7: Changes in the level of development of economies that developed successfully



Note: PPP based per capita GDP.
Sources: Maddison database, MNB calculation.

The countries that implement successful convergence are rather heterogeneous and different in terms culture and geographical location as well. At the same time, in addition to the application of advanced technology, operation with high economic efficiency is observed. **Accordingly, the conditions of escaping medium-level development include the realisation of this common feature as well as efforts to avoid various traps.**

Growth traps are examined, for example, by Eichengreen et al. (2013). Negative demographic developments, financial instability and unsustainably high investment rates are mentioned as underlying reasons. Various traps are identified in the case of Hungary as well, which are discussed in more detail in Chapter 1 of the Report. Firstly, demographic limits will become increasingly effective if steps are not taken. The number of those in active age will decline significantly in the coming decades, and the so-called old age dependency ratio[24] may rise considerably. Further traps may evolve as a result of the phenomenon of brain drain, i.e. the struggle for qualified employees. With low ability to create added value, various social traps may result in becoming stuck at a medium level of development.

If the competitiveness reforms are not implemented, the Hungarian economy may remain in the status of medium development and might follow the path of comparison outlined in the chapter in the next decade. **Avoiding the middle-income growth trap requires a broad-based, comprehensive turnaround in competitiveness.**

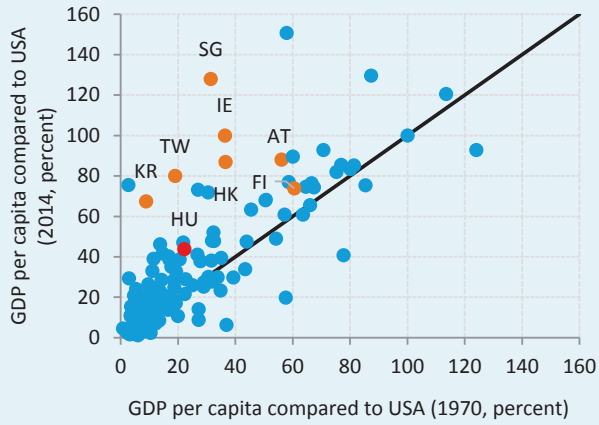
[24] An indicator applied to demonstrate the ageing of the society, showing the number of old people per one active-age person.

2.4 Empirical results

One obvious question is the extent to which actual observations confirm individual convergence types and processes. Convergence has been analysed in various ways, both performing simple data comparisons and using more complicated econometric methods, but we encounter many difficulties in the empirical examination of convergence, as this phenomenon takes place over a couple of decades, and large quantities of data are not available for all countries. Significant differences are observed between countries, and it is also difficult to take into account all of the control variables to receive totally unambiguous, conclusive evidence.

First, let us examine the assertion of absolute convergence, which is not confirmed empirically, as in fact **convergence is not an automatic process.** Looking at a wide range of countries, Chart 2-8 shows how certain countries' level of development evolved between 1970 and 2014. Many economies are close to the 45-degree straight line, i.e. no significant change took place in their relative development over the past nearly 40 years. Moreover, several observations are even below the straight, i.e. their relative level of development declined, while others were able to achieve stable and steady convergence over a longer period as well.

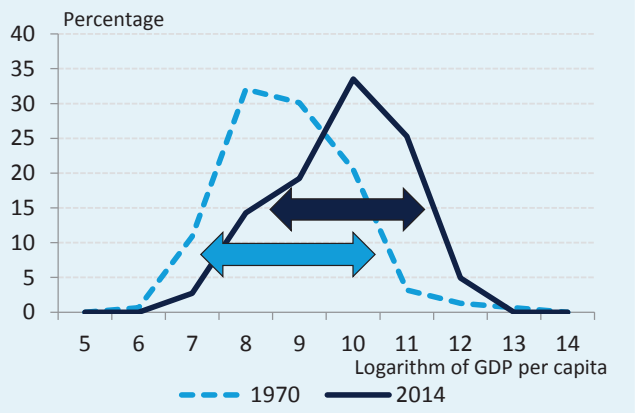
Chart 2-8: Changes in economic development between 1970 and 2014



Note: AT: Austria, HK: Hong Kong, FI: Finland, HU: Hungary, IE: Ireland, KR: South Korea, SG: Singapore, TW: Taiwan
Source: prepared by the MNB

The analytical tool for the distribution of income also corroborates the above conclusion. Chart 2-9 shows that over the past nearly forty years the distribution of per capita income in the world remained practically unchanged. Although it shifted to the right from 1970 to 2014, meaning that general per capita incomes increased, **the 'width' of the distribution did not become narrower, and income disparities between countries did not decline.**[25]

Chart 2-9: Distribution of per capita income in the world in different years



Sources: PWT, MNB calculation.

Convergence, i.e. development and catching up with the developed economies, is not a phenomenon that takes place automatically. Examining a wider range of countries over a time horizon of several decades, it is seen that there is no absolute convergence. An unobservable, natural, general and automatic process that would ensure that every country will develop over time and will be developed does not exist. Accordingly, there is no general recipe for economic development; it is a multi-factor process.[26]

It is a much more complex question to empirically address the forecast of neoclassical growth models, i.e. the existence of conditional convergence. One of the most difficult problems is that there are many factors that need to be considered in analysing the similarity of countries. Durlauf et al. (2006), for example, collected more than 100 factors[27] that all have an impact on growth. **Conditional convergence is usually tested by regressing the per capita growth by the level of past per capita income** and, of course, by other control variables. The latter are needed because of conditionality. Formally, the following equation can be estimated:

$$G_i = Y_{0,i}\beta + X_i\gamma + Z_i\theta + \epsilon_i,$$

where index i identifies the given country, G_i is growth in per capita income, $Y_{0,i}$ is the initial per capita income level, X_i are

25 This phenomenon is mentioned in the literature as sigma convergence.
26 The relevant difficulties and possibilities are dealt with in more detail in Chapter 1 of the Report.
27 In addition to the traditional main macro statistics, they include, *inter alia*, indicators related to education, health statistics, geographical conditions, length of coastline, number of days below freezing-point, defence expenditures, customs duties, etc.

the explanatory variables of the Solow model (e.g. population growth, technological advancement, savings rate), while Z_i represents further control variables that affect growth, and ϵ_i is a residual term, factors that cannot be modelled. The starting point of the estimate is that **if conditional convergence is true, there must be negative correlation between the past level of income and economic growth**, as an economy that starts from a lower level of development must grow faster to catch up with a developed economy. Accordingly, a significantly negative value would indicate the degree of reality of conditional convergence for parameter β.[28]

Unfortunately, empirical analyses are not concordant.[29] Initial researches were still able to demonstrate a negative parameter β, but various later studies pointed out that the findings must be handled with reservations for a number of reasons (exogeneity of explanatory variables, observation errors). **Accordingly, conditional convergence is empirically partly verifiable, but at the same time it is not totally unambiguous and universally valid.**

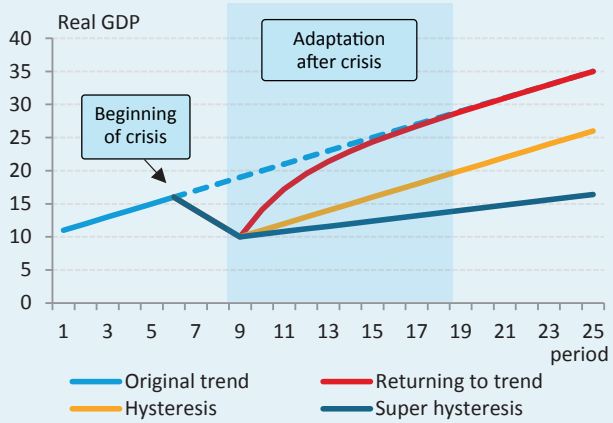
In reality, as opposed to the foregoing, it is mostly the case that so-called convergence clubs are observed, i.e. certain country groups actually converge to the same level of development. **This level of development, however, is not general, and not all countries are heading towards it, only the 'members of the given club'.** It is conceivable, for example, that investment in human capital entails various costs, and countries in a weaker financial situation are unable to finance it. However, human capital of adequate quantity and quality constitutes one of the bases of sustained economic growth and convergence. Accordingly, the economies that deviate from the initial income level may follow different paths of development, even if some of their macroeconomic fundamentals are similar.[30]

2.5 Crisis experiences

There are various lessons to be drawn from the latest global economic crisis; the subchapter below provides a brief summary of them. One of them is that prior to the crisis the general framework of thinking was that all variables can be decomposed into trend and cycle components. **The trend was equated to the component determined by the supply side.** In the long run, wages and prices adjust completely flexibly, and thus the value of the trend is determined by the available factors of production. **On the other hand, it is mostly the demand factors have an impact on the fluctuations and cycles around the trend.** One of the consequences of this consideration is that demand does not affect long-term developments. This is because economic policies that influence demand do not have an influence on long-term growth. Another consequence is that following the crisis, economies should return to the pre-recession trend line, but this clearly did not happen in the past 10 years.

This phenomenon became known as hysteresis; Blanchard et al. (2015) examined this issue in detail. They analysed more than one hundred recessions with different robustness examinations and found that **in nearly two thirds of the cases the level of GDP is below the pre-crisis trend.** This is called hysteresis. If not only the level, but GDP growth is also persistently below its pre-crisis dynamics, it is called **super hysteresis** (Chart 2-10). Blanchard et al. (2015) identified this phenomenon in about one third of the cases.

Chart 2-10: Stylised chart of hysteresis (changes in real GDP)



Source: prepared by the MNB.

Various explanations were given for the hysteresis in the literature. The most widespread arguments are summarised below:[31]

- **Damage to human capital**: Following a crisis, and especially if it is protracted, **the professional abilities of the long-term unemployed may decline**. If individuals who used to be employed do not train themselves due to lack of a job and cannot participate in trainings at a workplace, they are unable to acquire new knowledge and thus their knowledge can become outdated. These problems increase and accumulate as time goes by, e.g.

[28] This phenomenon is described in the literature as beta convergence.
[29] About empirical results see, e.g.: Baumol (1986), Barro (1991), Bernard – Durlauf (1996), Barro – Sala-i-Martin (2004).
[30] For more details see e. g.: Durlauf – Johnson (1995), Tan (2010).
[31] Hysteresis and its underlying factors are discussed in more detail in Chapter 1 of the 2016 Growth Report.

professional relationships become looser, and the individual's attitude to work may also change. Eventually, the chances of finding a job decline.

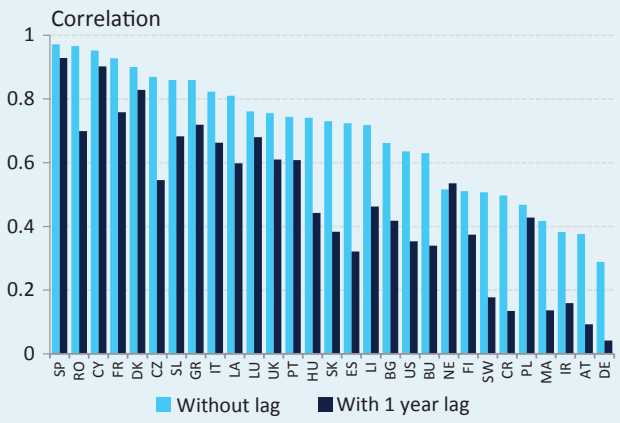
- **Uncertainty**: The general decline in aggregate demand as a result of the crisis and the increasing uncertainty make corporate behaviour more cautious, and thus companies postpone riskier investments. **Accordingly, as investment activity declines, no new production capacities are created**, resulting in increasingly obsolete machinery and equipment. In addition, as a consequence, better-quality, newer technology also tends to be used to a lesser extent, which also points to more restrained economic performance.

- **Financing conditions**: The above process is strengthened if economic agents are unable to finance their projects with a return. Additionally, as the past global crisis was a debt-type crisis, debt reduction and balance sheet adjustment constitute a longer, protracted process. Adjustment is a general phenomenon, and insufficient aggregate demand is seen from various economic agents, making recovery more difficult. Furthermore, a high ratio of non-performing, bad loans mean a credit supply constraint for both companies and households.

- **Decline in R&D expenditures**: If cost management following the crisis reduces R&D expenditures as well, the development and involvement in production of new technologies comes to a halt, and thus the potential growth possibilities of the economy may also decline.

Hysteresis has direct economic policy consequences. If economic downturns have longer-term consequences as well and are not merely a temporary, one-off cyclical phenomenon according to the traditional way of thinking, a different economic policy recommendation is acceptable. **If the long-term performance of the economy is not independent of cyclical fluctuations, the role of countercyclical policy is more important compared to what was thought before the crisis.** Lucas (2003), for example, was of the opinion that it is not worth paying special attention to the smoothing of economic cycles; countercyclical policy does not have a role in affecting social welfare. However, what is seen precisely in connection with the empirical research related to hysteresis is that **the long-term performance of the economy is not independent of the cycle, and there is close correlation between the two variables** (Chart 2-11). This is exactly what the recent global economic crisis shed light on. Accordingly, countercyclical leeway is a necessary condition of sustainable convergence, not only in the period of recession, but following that as well.

Chart 2-11: Correlation between output gap and potential GDP growth (2002–2016)



Note: In the period between 2002 and 2016.
Source: AMECO.

As a response to the protracted recovery, reference is made more and more often to the concept of the so-called **high-pressure economy**. The essence of the consideration originally proposed by Okun (1973) is that **economic policy must actively keep the economy under persistently high demand pressure, and thus permanently higher real economy performance can be achieved** following the crisis. Thus, according to this approach, economic policy has an impact not only on the cycle, but it is able to significantly affect potential output as well.[32] This concept is completely different from the general way of thinking that was typical of economics prior to the crisis.

The essence of this consideration is that if companies can expect predictably and persistently high aggregate demand, they raise their market and economic activities as well: they expand their capacities, i.e. they increase investment as well as the number of employees. Households' demand also becomes predictable as a result of the stable labour market situation and positive income prospects. Accordingly, aggregate demand rises further and provides additional stability, strengthening the process.

At the same time, there are usually two main counter-arguments against the high-pressure economy: firstly, it may cause overheatedness, which can result in a crisis if it takes place in conjunction with economic imbalances. The other counter-argument is that the **high-pressure economy carries risks in terms of inflation**. Persistently high demand may result in

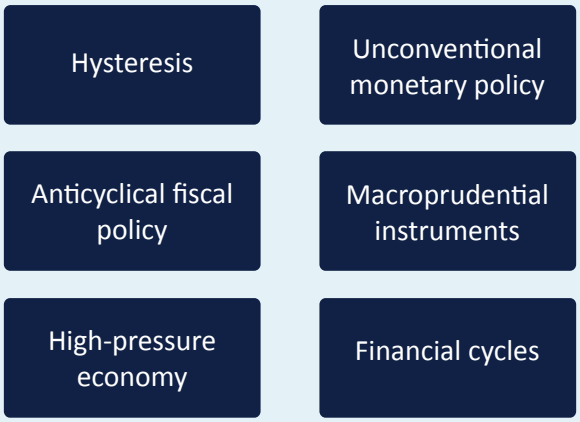
[32] See e. g.: Fatás – Summers (2016).

higher inflation than desired. At the same time, the latest studies (a detailed summary is provided, for example, by Szentmihályi – Világi, 2015) show that the inflationary effects from the real economy declined, and the so-called Phillips curve became continuously flatter in the past decades.[33]

In addition, the importance of focusing on financial cycles increased following the crisis.[34] According to this, financial cycles affect real economic cycles. Moreover, financial cycles are much longer (possibly even exceeding 15 years) than the traditional business cycles of 2–8 years, and thus disregarding their impact may cause more permanent difficulties. Therefore, **macroprudential policy is of the utmost importance**.

The financial crisis highlighted that microprudential regulations alone are insufficient and are unable to prevent situations evolving as a result of systemic financial turmoils and their significant negative impact on the real economy. An example for this in Hungary was the spread of foreign currency lending and the excessive indebtedness. In order to prevent them it is necessary to apply **macroprudential instruments**, **main aim of which is to reduce excessive systemic financial risks**, and thus minimise real economy losses in the case of a crisis.[35]

Chart 2-12: Crisis experience – key words



Source: prepared by the MNB.

The crisis also had a serious impact on the conduct of monetary policy. Initially, there were attempts to reduce real economy losses using traditional instruments (interest rate cuts). However, this did not result in sufficient stimulus, and as a result, unconventional instruments started to appear among central bank instruments.[36] The 'failure' of traditional instruments in a period like this is easy to explain: in an insufficient demand environment inflation is usually also low, and thus lowering nominal interest rates cannot sufficiently reduce real interest rates. Therefore, interest rate policy alone may only exert a minor stimulating effect.

Previously, the opinion on fiscal policy was also that – even though it plays a major role in terms of social welfare – its role in smoothing business cycles was smaller. This was mainly justified by saying that fiscal intervention exerts its effect with a delay, and thus it is conceivable that by the time a measure becomes effective, it is not even needed because the cyclical movement in question is already over. Of course, this is not true in the case of an extended crisis. In addition, previously it was thought that the effect of fiscal policy is small and the so-called fiscal multiplier is low. Nevertheless, various studies proved that **in the cases of unutilised capacities, during times of crisis, the fiscal multiplier is greater than in a 'normal' period**,[37] and thus fiscal stimulus may be expressly suitable for crisis management. **At the same time, it is important to provide adequate leeway**, as fiscal stimulus should not be allowed to result in an imbalance. This is when **countercyclical fiscal policy** plays a prominent role: in the case of an upswing, it 'saves' and reduces the deficit and government debt, and thus it is able to stimulate the real economy in a recession without a build-up of imbalances.

Last, but not least, in terms of the growth of an economy one important issue is the examination of **income distribution**.[38] Berg and Ostry (2011), for example, came to the conclusion that **an economy where disparity is lower can attain more permanent growth.** Prior to the crisis, the consideration of wage-based competitiveness was an important aspect, but by now it is not considered as evidence. Firstly, competitiveness depends on a number of other factors, and secondly, in the case of an economy that operates with a persistently low wage level, the phenomenon of the so-called brain drain may hinder later competitiveness: underpaid special knowledge leaves the country in question. Although

[33] In addition, it is possible to treat the possible unwanted side effects of the high-pressure economy with targeted stimulation of aggregate demand. This means that not overall general aggregate demand should be stimulated, but the area(s) where demand conditions are less adequate. In this case, there would not be a general additional inflationary effect. See, for example, Kregel (1987).

[34] See e. g.: Borio (2012).

[35] The macroprudential instruments and their application are described in detail in Act CXXXIX of 2013 on the Magyar Nemzeti Bank.

[36] A detailed description of the Hungarian case is provided in the central bank's book entitled 'A Magyar út – célzott jegybanki politika' (The Hungarian Way – Targeted Central Bank Policy), 2017.

[37] For a summary of the fiscal multiplier as well as the latest post-crisis theoretical and empirical findings concerning economic cycles see, e.g. Molnár – Soós – Világi (2017).

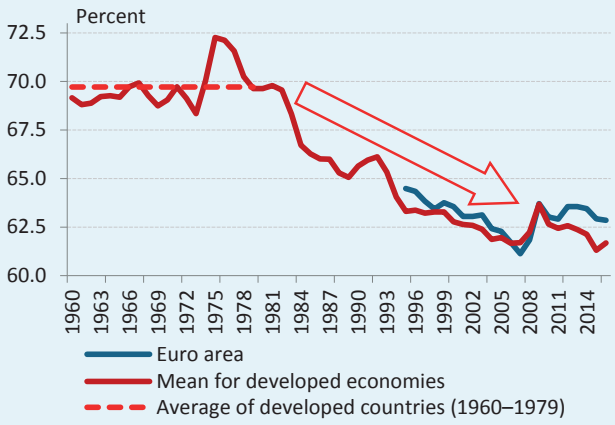
[38] This topic is discussed in more detail in last year's Growth Report, December 2017.

a decline in the wage share (the figure showing the wage bill-to-GDP ratio)[39] may improve export competitiveness in the short run and thus result in higher growth, this effect does not offset the fall in domestic demand. Moreover, it does not contribute to the increase in the ratio of exports with higher added value, which is one of the conditions for sustained convergence.

There are many indications that the relationship between wages and long-term growth possibilities changed in the past period; therefore, this effect cannot be disregarded when convergence processes are examined. According to the earlier concept, the role of wages was mostly passive when the determinants of long-term growth were analysed. At the same time, the crisis made us realise that we must think about wages in another way, and they have to be given an active role in the analysis of longer-term developments as well (Virág, 2018).

One phenomenon observed since the 1980s is that the wage share has declined steadily (Chart 2-13), and employees receive less from the income produced (as opposed to the owners of capital). There is no generally accepted explanation for this phenomenon; presumably, various impacts may jointly be the underlying reason. They may include, *inter alia*, the weakening of employees' federations, globalisation, the strong polarisation of the labour market as well as the fact that this phenomenon is inevitably typical of capitalism. Although the reasons are not clear-cut, the consequences are: **increasing income disparities reduce social cohesion, and lead to lower economic growth over the longer run**. Based on the estimation results of Onaran – Obst (2016) regarding the euro area, a 1 percent lower wage share results in an approximately 0.3 percent lower GDP level. Of course, this result cannot be automatically generalised for all economies, but the wage share in developed economies fell by nearly 10 percentage points during the recent decades (Chart 2-13), and thus the GDP effect may be strong.

Chart 2-13: Wage share in developed countries



Source: AMECO. prepared by the MNB.

Accordingly, it can be established that – due to the impact of wages on long-term growth – active wage policy must be accorded an important role. There is an endogenous relationship between wages and productivity,[40] and thus, **in addition to improving supply conditions, a continuous rise in wages is also necessary for the implementation of adequate economic convergence.**

On the whole, the crisis focused attention on a number of important factors, which may later help similar crises to be avoided and may contribute to more persistent and stable economic growth.

[39] For a detailed analysis of the decline in the wage share observed in the past decades see: Piketty (2013).
[40] Higher productivity results in higher wages, but at the same time higher wages motivate employees, and thus their work may be more productive.

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3 The macroeconomic path of sustainable convergence

The convergence of the Hungarian economy restarted in 2013, accompanied by a robust, extensive growth period. One of the most important economic policy questions is whether Hungary's convergence, which restarted in recent years along a balanced path, will continue in the future. Our Growth Report focuses on what macroeconomic and medium-level goals are needed for that to occur. In this chapter, the emphasis is on macroeconomic goals.

During a country's convergence process, various states of equilibrium are conceivable. A unique opportunity for the Hungarian economy after the 2010 economic policy turnaround that it can become a group of developed economies with reforms, while on the other hand, if reforms do not take place, it may become stuck in the so-called middle-income trap. Based on the principle of the multi-equilibrium approach, over the long run both paths can be considered as equilibrium paths. There are various studies on the reasons why certain economies get stuck in the status of medium development (e.g. low-quality human capital, lack of innovation, income disparities, financing difficulties, etc.) and why others are able to implement successful convergence. The countries that implemented successful convergence are rather heterogeneous and different in terms culture and geographical location as well. At the same time, application of advanced technology and operation with high economic efficiency are observed in the case of all successful converging economies. Accordingly, the conditions for exiting medium development include the realisation of this common feature, as well as efforts to avoid various traps.

A sustainable macroeconomic path implemented as a result of a turn in productivity (reform path) and a scenario for comparison (middle-income trap) are outlined in this chapter. The reform path is the macroeconomic path of sustainable convergence taking place if the reforms are implemented. The other one is the middle-income trap path, resulting in Hungary's remaining in the status of medium development if the competitiveness reforms fail to be implemented. Accordingly, this path also serves as a kind of benchmark.

It is not possible to exit the status of medium development as an undesirable equilibrium by taking small steps: comprehensive measures are needed. In the case of Hungary, this means competitiveness reforms in the coming period. If such reforms are implemented, wages will nearly double in the next 10 years, and from the current 55 percent level, Hungary will reach 80 percent of the level of development of Austria. Looking ahead, the aim is to sustain organic economic growth, the main driving forces of which are a significant rise in real wages, robust economic growth, maintaining full employment and a considerable increase in capital intensity and productivity. With comprehensive reform measures, all of this can occur along an equilibrium path: a steady surplus is registered on the current account, a completely balanced budget is achievable and the government debt-to-GDP ratio declines significantly.

Introduction

Starting from the political transformation until the present, macroeconomic developments in Hungary can be divided into clearly distinguishable periods.[41] In the early 1990s, i.e. in the period of transformation, GDP fell considerably, which was coupled with a high level of inherited public debt as well as external and internal imbalances. Although the subsequent adjustment contributed to the creation of a balance, it restrained growth. Following that, between 1997 and 2001, while external and internal equilibrium remained in place, strong, sustainable growth was observed. After that, convergence continued in parallel with significant indebtedness, in an unsustainable manner. Finally, starting from 2010, balance was restored, and following a turnaround in monetary policy, from 2013 Hungarian convergence restarted in a state of equilibrium.

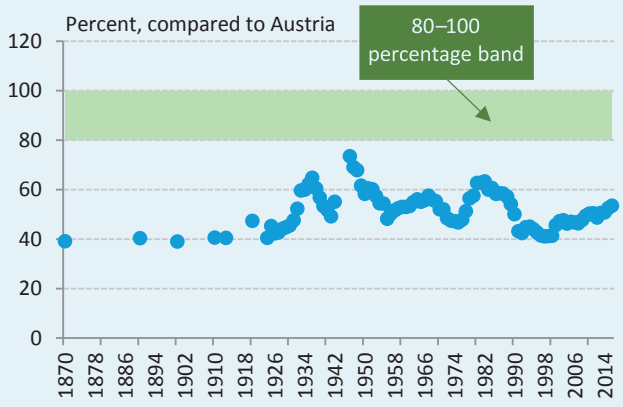
Looking ahead – from now until 2030 – two macroeconomic paths are outlined. Both scenarios are paths materialising in an equilibrium: on the given path, potential GDP growth and actual GDP growth are identical, i.e. none of the paths include any additional inflationary effect.[42]

One of the paths is the so-called **reform path**: the macroeconomic path of sustainable convergence, which can occur if the reforms are implemented. The other one is the so-called **middle-income trap path**, which – as corroborated by substantial international experience – essentially results in Hungary remaining in the status of medium development if the competitiveness reforms fail to be implemented. In that case, there would be no further significant progress in Hungary's relative state of development. Accordingly, this path also serves as a kind of benchmark. To summarise: without comprehensive competitiveness measures the latter path would materialise, whereas the macroeconomic path consistent with comprehensive competitiveness measures is the reform path. From now until 2020 we used the central bank's current projection prepared for this period.[43] Accordingly, the projection horizon for both paths lasts from 2021 to 2030.

3.1 Determining the main macroeconomic goals

Over the past 150 years, several attempts to catch up with the development level of Austria failed. In many cases, economic growth was based on indebtedness and was thus unsustainable. At other times, major historical events such as world wars or economic crises prevented convergence. As of the middle of the 20th century, Hungary's level of development was unable to permanently rise (Chart 3-1).

Chart 3-1: Hungary's development compared to Austria

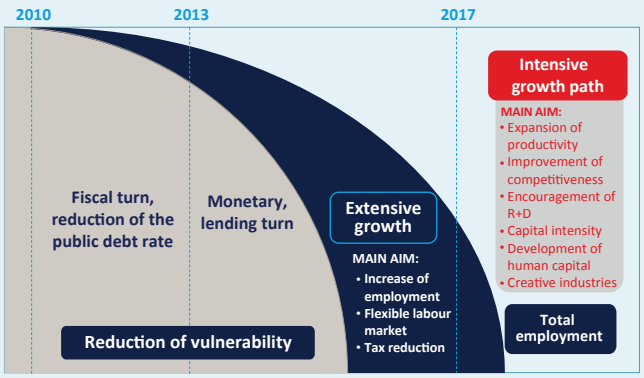


Sources: Maddison database, MNB calculation.

However, the fiscal policy turnaround in 2010 and **the monetary policy turnaround in 2013** resulted in stabilisation and a persistently declining path for the government debt ratio, and **Hungary's convergence to the developed Western countries restarted**.[44] Accordingly, for the past one half decade the Hungarian economy has been growing along an equilibrium path, with contributions from a number of government and central bank measures as well as improvements in all major macroeconomic indicators. Looking ahead, while preserving the favourable results achieved to date, the fundamental element of the change-over from the extensive growth period (significant increase in employment) to the intensive one (increase in productivity) is the implementation of reforms (Chart 3-2).

[41] For more details see Palotai – Virág (2016).
[42] Box 3-3 outlines a scenario where imbalance evolves.
[43] MNB (2018).
[44] A detailed overview of the consolidation in the period between 2010 and 2014 is provided by Matolcsy (2015).

Chart 3-2: Main developments from 2010



Source: prepared by the MNB.

As described above, starting from 2010, the historic shifts in economic policy put the Hungarian economy on a stable convergence path. At the same time, individual, non-recurring factors also contributed to growth during this period.[45] Following the successful economic stabilisation, the possibilities of extensive growth are slowly disappearing. Thus, **looking ahead, a competitiveness reform as a comprehensive, general and broad-based reform measure concerning all the segments of the economy is needed** for further sustainable and buoyant economic expansion, **which can ensure a persistent rise in the level of development of the Hungarian economy**. This subchapter presents a macroeconomic path that is consistent with this. Table 3-1 contains a summary of the main results.

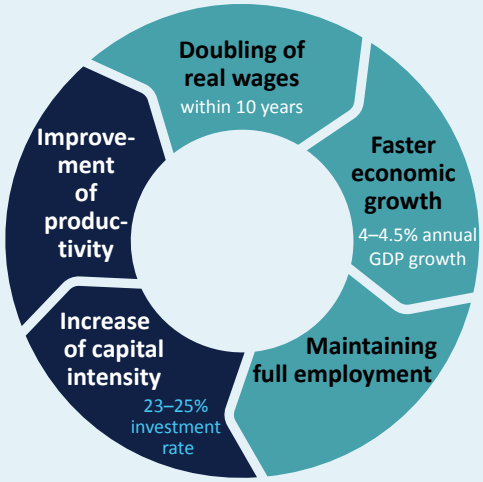
Table 3-1: Macroeconomic results feasible by 2030

	Middle-income trap	Reform path
Relative development level compared to Austria	64	86
Average potential GDP growth	1.6	4.4
Accumulated increase of net real wages	37	87
Level of wage share	59	58
Current account balance	Turns into negative	Remains in surplus persistently
Net external debt[1]	Remains at current level	Decreases
Inflation	3	3
Balance of the budget[1]	-2.0	0.5
Gross public[1]	59	38

Note: [1] as percentage of GDP.
Sources: HCSO and MNB.

Looking ahead, the objective is to sustain organic macroeconomic growth (Chart 3-3). The main relevant steps are processes that are mutually reinforcing. **Firstly, a steady increase in real wages** is a crucial factor to convince labour that is competitive in production to stay in Hungary or to return. In conjunction with full employment, increasing capital intensity facilitates the progress in productivity, which allows a rise in real wages to be accomplished economically. In addition, because **there is an endogenous correlation between wages and productivity, not only is an improvement in supply conditions needed, a steady rise in wages is also necessary for the realisation of adequate economic convergence** (Virág, 2018): nearly doubling net real wages in 10 years is an important macroeconomic goal.

Chart 3-3: Sustaining organic economic growth



Source: prepared by the MNB.

[45] They were, for example, the conventional and non-conventional monetary policy measures conducted after 2013, the rise of more than 700,000 in the number of employed as well as the inflow of EU funds.

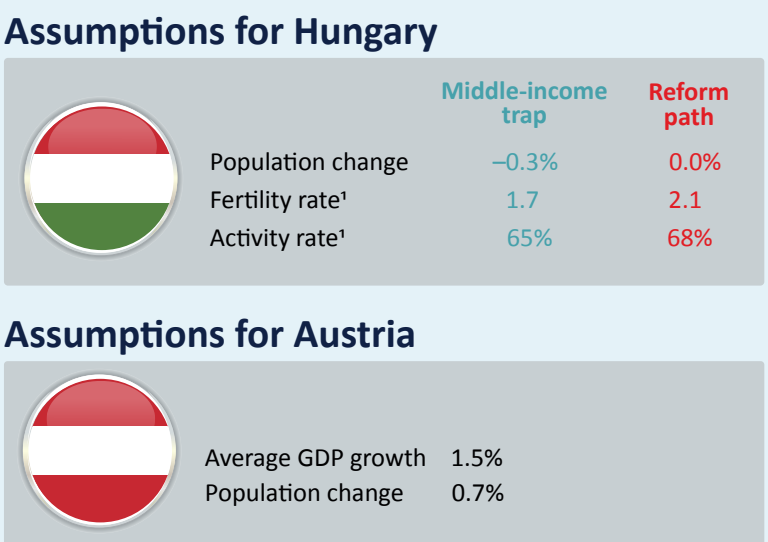
Box 3-1: For convergence calculations: basic assumptions for macroeconomic projections

When making macroeconomic projections, it is expedient to set benchmarks. This is a general rule, as it is difficult to assess a single path on its own. Accordingly, we prepared two simulations during the projection. One is a macroeconomic path in a reform scenario and one is the comparison path, i.e. the scenario of the middle-income growth trap. Nevertheless, due to the nature of the subject matter, such a comparison over time is insufficient: spatial comparison is also necessary. The comparison to Austria serves this purpose, examining the differences between its macroeconomic indicators and Hungary's macroeconomic variables. For both domestic paths (reform and middle-income trap) different assumptions were used for Hungary, but, of course, during the comparison to Austria the same assumptions were applied to the Austrian macroeconomic path in both cases.

The level of development is measured as the value of GDP per capita and is compared to Austria. Accordingly, our assumptions concerning changes in the Austrian population and its growth have an impact on the expected path of relative development in Hungary. In line with this, if a path other than our external assumptions is realised, the results may change accordingly. In line with our assumption of potential GDP growth in Austria, we expect average annual growth of 1.5 percent in Austria over the next 12 years, while its population will increase by an annual 1 percent during this period. This corresponds to the baseline scenarios of Eurostat and the OECD.

The Hungarian population, fertility and activity rates are different on the reform and non-reform paths. The fundamental reasons are precisely the reforms, which influence these factors as well. In the case of the population, a demographic turnaround may materialise over this horizon, and we took into account the achievement of a fertility rate of 2.1 by 2030. The more favourable change in population is not only due to this factor, but also (as a result of a strong increase in Hungarian wage levels) to the return of Hungarians, who had previously moved abroad. This raises the activity rate as well. By contrast, moving on the middle-income trap path, compared to its current value the fertility rate improves only slightly. At the same time, failure to implement reforms and the unchanged wage level result in the emigration of skilled labour. Thus, on the whole, lower population and lower activity are taken into account for this path.

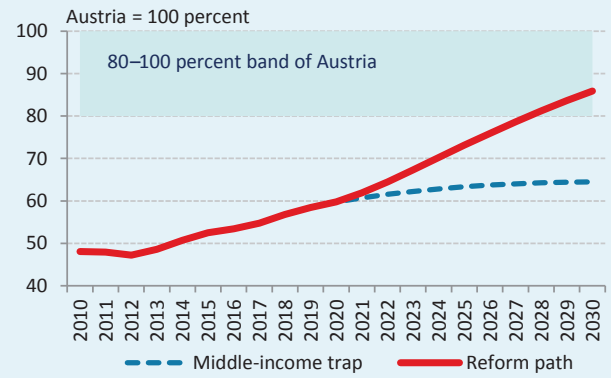
Chart 3-4: Basic assumptions for the calculation of the macroeconomic projection



Note: [1] At the end of the horizon, in 2030.
Sources: Eurostat, OECD and prepared by the MNB.

If the reform measures are implemented, the next 10–12 years will be a period of strong productivity, wage increases and capital intensity. As a result of the reforms, 80–90 percent of Austria's level of development may be achieved in this period[46] (Chart 3-5). Without a turnaround in competitiveness, Hungary's convergence may come to an end after the period of extensive growth, and the Hungarian economy may remain in the middle-income growth trap. The process of convergence from previous years would not continue in this case.

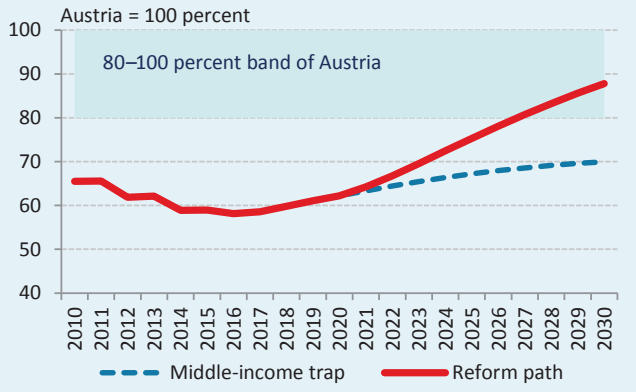
Chart 3-5: Relative development level compared to Austria



Sources: Maddison, Eurostat, IMF, MNB calculation.

In conjunction with the significant rise in the labour force and the spread of part-time work, labour productivity calculated on the basis of per capita output was unable to increase significantly in recent years. **Looking ahead, with full employment as well as greater capital deepening and more efficient working, labour productivity rises significantly** (Chart 3-6).

Chart 3-6: Changes in labour productivity compared to Austria

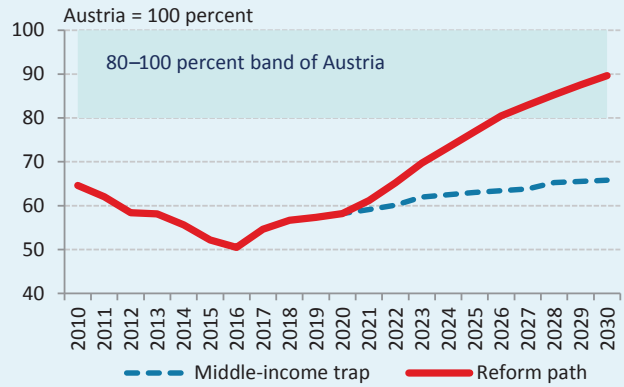


Sources: AMECO, MNB calculation.

Achieving this progress requires various factors, and of these the main factor pointing in this direction is a comprehensive turnaround in competitiveness: an increase in productivity, stimulation of R&D, raising capital intensity, a decline in import dependency, a rise in domestic savings, the development of human capital as well as a significant increase in wages, in order to keep qualified people in Hungary and ensure their further development.

Looking ahead, one of the main macroeconomic goals is a significant rise in the wage level. If the wage convergence observed in recent years fails to continue in the future, there is a much higher probability of a continuous, ever stronger outflow of skilled labour. On the reform path, wages rise in parallel with an expansion in productivity, while net wages grow at a faster pace due to the gradual decline in the tax wedge. Accordingly, looking ahead, we expect net wages to nearly double, and thus the wage level will be in the band of 80–100 percent compared to Austria (Chart 3-7).

Chart 3-7: Wage level compared to Austria



Sources: AMECO, MNB calculation.

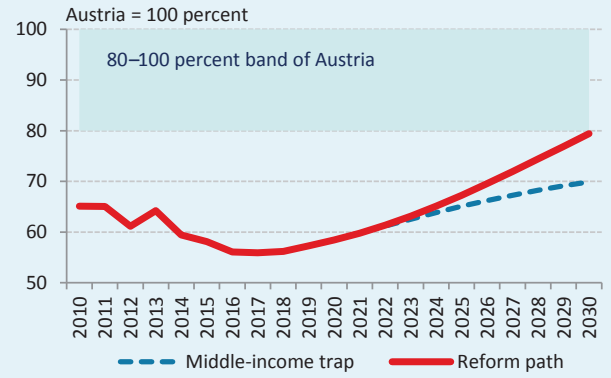
A shift is necessary from the extensive growth experienced in the past towards intensive growth. While in the former case the significant expansion in employment was one of the most important driving forces in macroeconomic terms, in the coming years the increase in employment will contribute to growth to a relatively lesser degree compared to the previous years, and a strong improvement in productivity will be more important. **At present, the capital–labour ratio is below the Austrian indicator; therefore, a significant rise in this indicator is necessary, due to capital deepening** (Chart 3-8).

In the scenario of the middle-income trap path, investment activity is much lower and the capital–labour ratio is still slightly growing. The underlying reason is that in this scenario the emigration of labour due to the wage level

[46] Our assumptions for the benchmark country (Austria) are summarised in Box 3-1.

consistently reduces the value of the denominator, and thus the capital–labour ratio rises in relative terms. However, due to the aforementioned reasons, the structure of this latter change is not healthy.

Chart 3-8: Capital–labour ratio compared to Austria

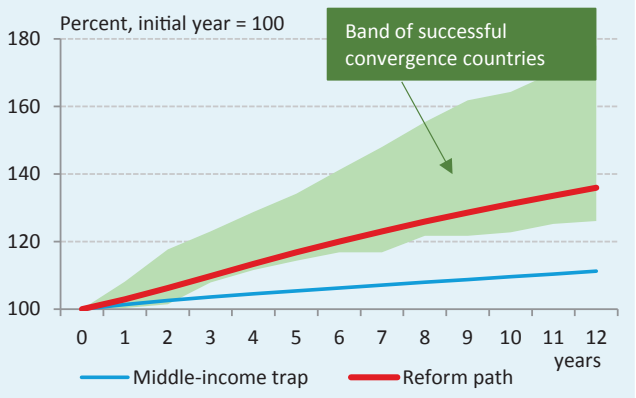


Sources: AMECO, PWT, MNB calculation.

3.2 Total factor productivity assumptions

One important assumption in the macroeconomic calculations is what total factor productivity (TFP) the paths are consistent with. In both scenarios, our assumption was calibrated on the basis of international experience. With the reforms, TFP increases significantly (Chart 3-9). The time series of economies achieving successful convergence are indicated in a band in the chart, and the reform path is also in this band.

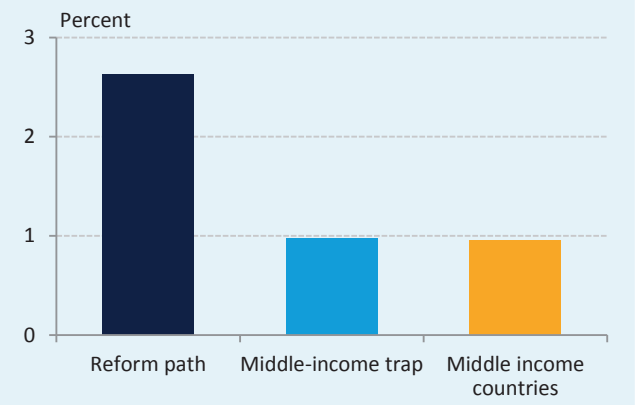
Chart 3-9: Total factor productivity assumption



Note: The band was prepared from the successful growth period of Austria, Hong Kong, Finland, Ireland, Japan, South Korea, Singapore and Taiwan; year 0 is the beginning of the successful convergence period. Data for Hungary start from the beginning of the projection horizon.
Sources: AMECO, PWT, MNB calculations

Chart 3-10 shows the annual average TFP growth rates. On the reform path it is 2.5–3 percent, while on the middle-income trap path it is around 1 percent. In the case of the latter, calibration was also based on international experience, **and therefore, the average TFP growth of middle-income economies was taken as a basis.**

Chart 3-10: Total factor productivity growth assumptions

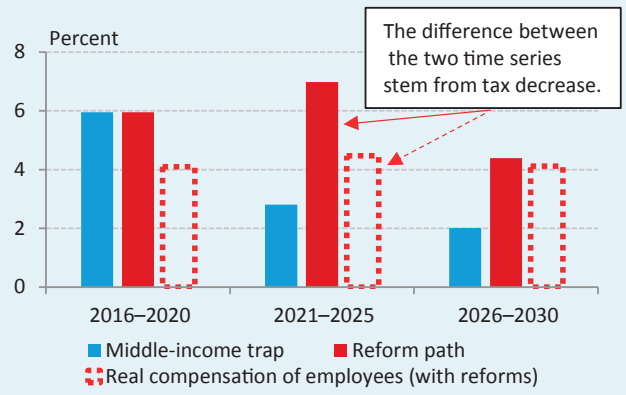


Note: The chart depicts the average TFP growth observed over the past 20 years in economies at a medium level of development according to the current classification of the World Bank. In the case of Hungary, the average was taken at the projection horizon.
Sources: AMECO, PWT, MNB calculation

3.3 Evolution of wages and employment

In the case of economies that grow on an equilibrium path, real wages rise steadily, without major internal and external fluctuations, in parallel with productivity. Accordingly, on the reform path a strong net real wage increase of 7–8 percent is continuously achieved for several years, with additional contributions from the decline in the tax wedge.[47] As a result, net real wages show stronger dynamics compared to the increase in wage costs (Chart 3-11). By the end of the horizon under review, net real wages nearly double. In the middle-income trap scenario, together with low productivity, restrained wage increases would be achieved, but in the case of this path as well the effects of the reductions of the social contributions on the basis of previously announced rules were also taken into account. The relevant advantage is partly transferred by the corporate sector to the employees.

Chart 3-11: Annual change in net real wages (average of the period)

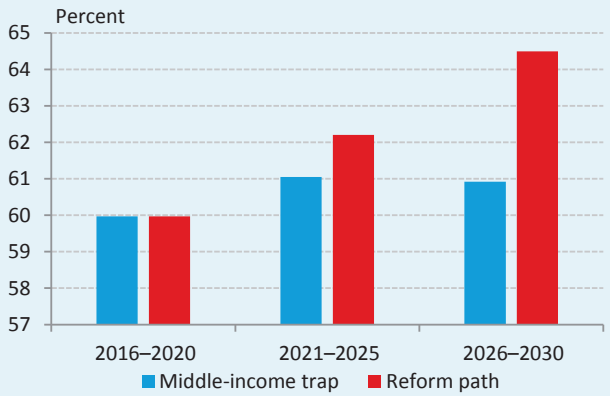


Source: MNB calculation.

There is no major difference between the wage shares in the two paths. **The significant rise in wages in the reform scenario does not result in a wage-based competitive disadvantage**, as it is coupled with a large improvement in productivity, and the higher economic growth is realised in a stable manner and balanced structure.

A steady approach to the full employment level has been observed in recent years. The turnaround in competitiveness will help to sustain this outstanding economic policy achievement. **The reforms allow for the preservation and even expansion of jobs.** The employment rate rises further on the reform path as people return to Hungary because of the higher wage level (Chart 3-12). In the middle-income trap scenario, more subdued economic performance and less favourable demographic developments jointly result in a lower employment rate.

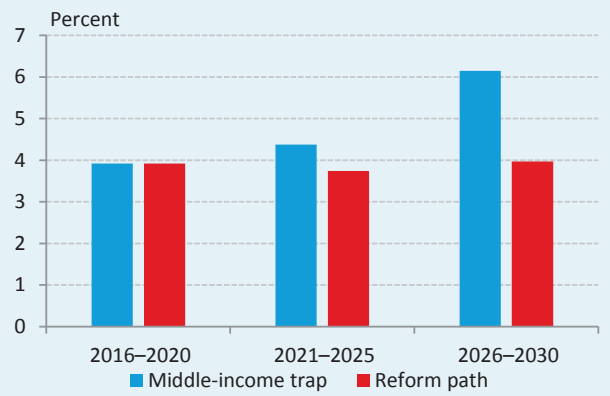
Chart 3-12: Employment rate (average of the period)



Source: MNB calculation.

On the middle-income trap path, we assume that –although activity was successfully and persistently raised – **because of new technologies and robots, the natural unemployment rate in Hungary rises to the historical average** (Chart 3-13). In this case, the employment level would decline. Most studies confirm that robotisation takes away as much work as it creates. However, this requires an educational and human capital strategy that concentrates on the development of skills and abilities, and supports the flow of labour between sectors and activities. The impact of the process on the unemployment rate depends on whether those who lose their jobs remain in the labour market or become inactive. Due to the flexible labour market regulations in Hungary we consider the former more likely. **At the same time, unemployment remains persistently low on the reform path, as labour supply is able to adjust to the change in demand.**

Chart 3-13: Unemployment rate (average of the period)



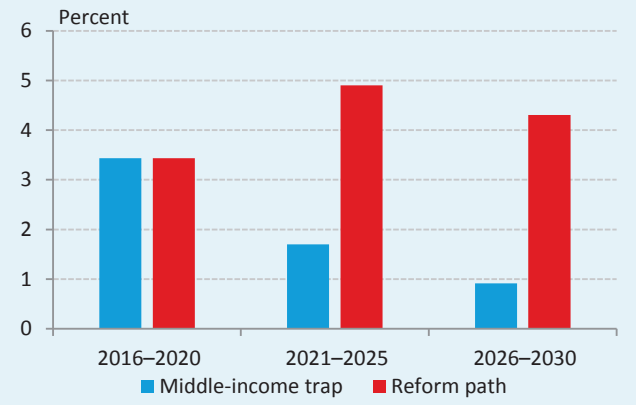
Source: MNB calculation.

[47] For more details see Box 3-3.

3.4 Changes in GDP and its components

In the reform scenario, GDP growth reaches 5 percent, before decelerating to some extent starting from the middle of the period under review, as Hungary approaches Austria (Chart 3-14). As the cyclical position closes, from 2020 economic growth remains steadily on an equilibrium path **at a rate identical to potential growth, and thus does not have any additional effect on inflation.** Without reforms in the middle-income trap path, the deceleration in growth is continuous from 2018 and the rate would fall to nearly 1 percent by the middle of the next decade.

Chart 3-14: GDP growth (average of the period)

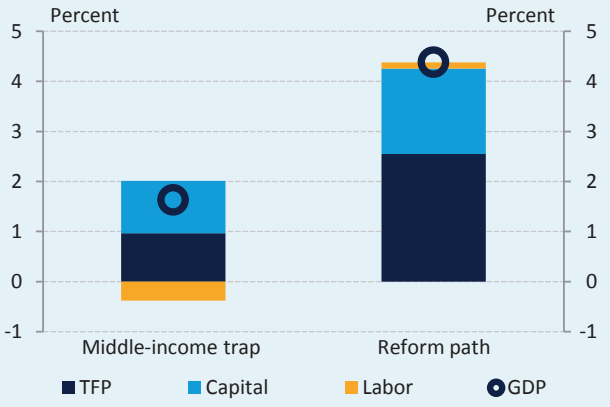


Source: MNB calculation.

The components of GDP growth are examined from two sides. On the one hand, the decomposition of potential GDP growth into its components (Chart 3-15) reveals that the contribution of all factors is much less favourable on the middle-income trap path. In absence of further measures, TFP growth gradually slows down and is much lower than in the case of reforms.

If reforms are not implemented, subdued labour productivity and lower wage outflows restrain household consumption. When demand is generally low, companies reduce their capacities and need fewer employees. In addition, the absence of investment reduces the contribution of capital as well after some time. The contribution of labour as a factor of production has a negative impact on potential growth. However, **both labour demand and labour supply contribute to it.** As the wage level fails to rise, underpaid skilled labour leaves.

Chart 3-15: Decomposition of potential GDP growth in the two scenarios as an average of the horizon

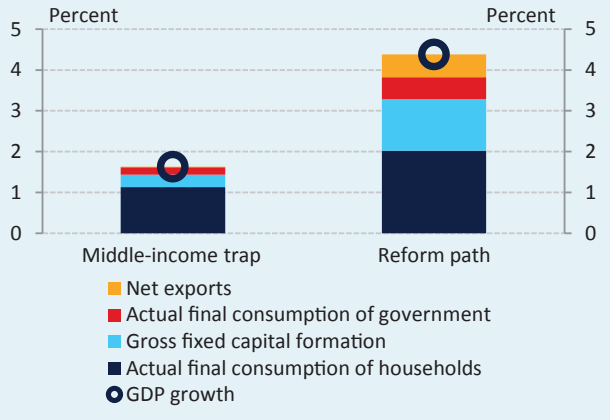


Note: Average values on the horizon of the projection period.
Source: MNB calculation.

By contrast, on the reform path, those who left Hungary return, and thus the contribution of employment to growth is slightly positive rather than negative, in spite of the demographic constraints that are still effective at the beginning of the period. As a result of the much higher investment activity, the contribution of capital to growth is also more significant compared to the other scenario.

On the basis of the decomposition of GDP growth from the expenditure side, the main difference between the two scenarios is that with no reforms net exports remain close to zero on the middle-income trap path, while on the reform path they are positive (Chart 3-16). There are two underlying reasons. Firstly, on the reform path, with the improvement in Hungary's competitiveness, its export market share increases steadily, i.e. its export performance is much better. Secondly, the decline in relative import demand improves the contribution: Hungary produces good quality products, and thus foreign goods are substituted by Hungarian ones. Contributions of all items to growth are significantly lower without reforms in the middle-income trap scenario.

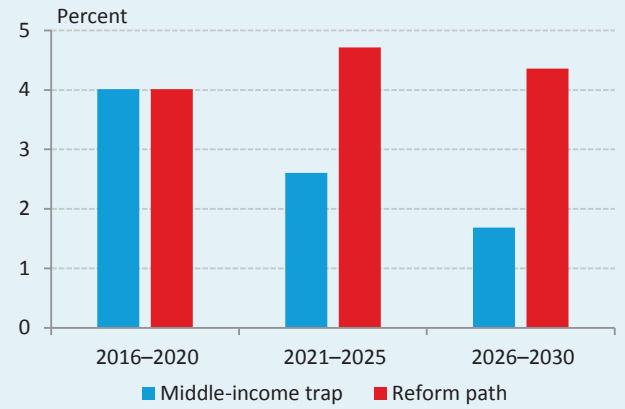
Chart 3-16: Decomposition of GDP growth from the absorption side as an average of the horizon



Note: Average values on the horizon of the projection period.
Source: MNB calculation.

In the reform scenario, household consumption remains strong due to the much greater increase in the wage bill. **The factor that has the greatest impact on household consumption in the long run is the evolution of real wages** as permanent income. Accordingly, taking consumption smoothing habits into account, on both paths household consumption changes in parallel with real wages (Chart 3-17).

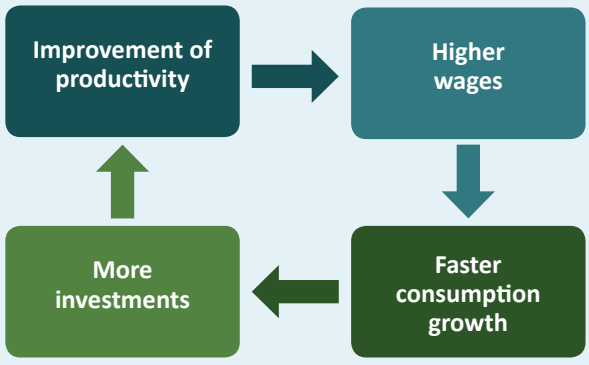
Chart 3-17: Consumption growth (average of the period)



Source: MNB calculation.

A strong increase in consumption is presumed on the reform path. Firstly, as a result of higher productivity and wages as well as higher employment, the total disposable wage bill supports a strong increase in consumption in the reform scenario. **Secondly, steady demand for companies' products and services has a positive impact on both the operating and investment activities of firms.** In addition to improving corporate profitability, the higher and more developed capital stock results in a further increase in productivity, real wages and thus in consumption (Chart 3-18). The process is self-sustaining if it takes place in balance with other macroeconomic variables.

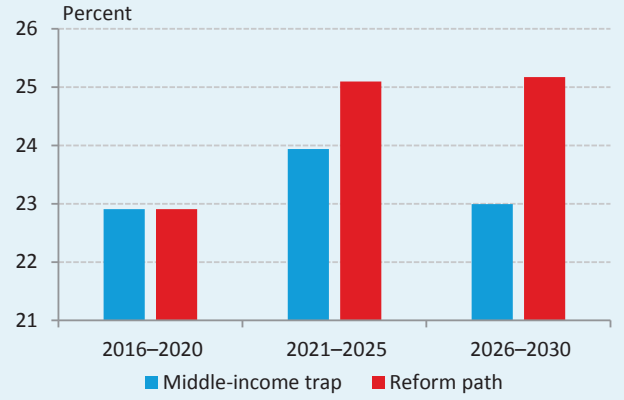
Chart 3-18: From productivity to productivity through growth in consumption



Source: prepared by the MNB.

One of the most important variables that reflects the turn in competitiveness is the developments in investment, which expands dynamically and at a persistently high level on the reform path. **Over the long run, investment turns into capital, and expands the production capacities of the economy.** The investment rate is consistently higher in the reform scenario (Chart 3-19). In this regard, it was assumed that as the prices of investment goods may decline due to technological progress, this in itself has a reducing effect on rates. This is a global megatrend,[48] which was taken into account in the calculations.

Chart 3-19: Investment rate (average of the period)



Source: MNB calculation.

As a result of the reforms, the performance of Hungary's export sector also increases significantly. Looking ahead, Hungary's export market share increases further. Owing to the dynamic growth in expenditure items, imports are also stronger, but not as much as exports, the underlying reason for which is the decline in relative import demand.

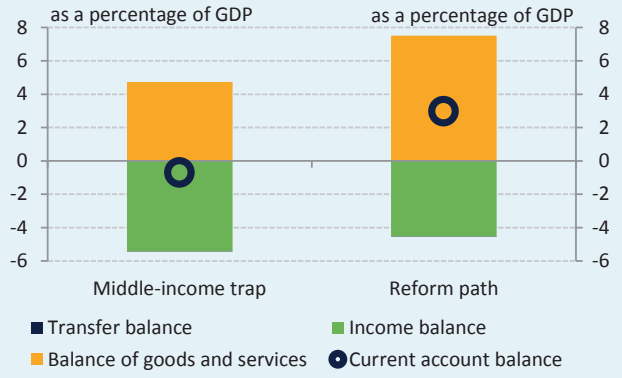
3.5 Changes in the items of the current account

The current account surplus can be sustained for an extended period, if comprehensive and concerted reforms are implemented (Chart 3-20). The current account surplus is expected to stabilise at the level of 1–2 percent until 2020, which is mainly attributable to the negative effect of strong domestic absorption on the trade surplus as well as the positive effect on exports of investments slated to be implemented in the meantime. In terms of sustainable convergence, changes in the trade surplus after 2020 will be a key factor, because without competitiveness reforms the trade

[48] Megatrends are dealt with in more detail in Chapter 1.

surplus would decline again in the middle-income trap scenario, possibly resulting in a current account deficit within some years, and imbalances may evolve again in the economy.

Chart 3-20: Current account balance-to-GDP ratio (average of periods)



Note: Average values on the horizon of the projection period.
Source: MNB.

Maintaining a significant trade surplus is indispensable to preserving and expanding the current account surplus; to this end, the reforms increase Hungary's export market share and reduce its dependence upon imports by making Hungarian exports more competitive. In the years to come, as a result of an upturn in import-intensive investment and an expansion in household consumption, a moderate trade surplus is expected. In parallel with that, deterioration in the terms of trade related to rising oil prices will also impair the balance, the effect of which may roughly be offset until 2020 by the positive effect on exports of investment projects slated for completion. In order to prevent the foreign trade developments from resulting in a current account deficit over the long run, measures that improve the value-generating ability of the Hungarian economy must be implemented. The coordination of industrial, export, energy and SME strategies and their implementation may result in an increase in Hungary's export market share and reduce its dependence on imports by making Hungary's exports more competitive, thus contributing to the evolution of a sustainable, stable trade surplus.

Implementing competitiveness reforms also plays an important role in reducing the deficit on the income balance. Without such reforms in the middle-income trap scenario, the deficit would presumably increase in the second half of the projection period. In the absence of competitiveness reforms, the deficit on the income balance is expected to rise over the long run, mainly as a result of increases in foreign companies' profits. In addition, the permanent emigration of Hungarian employees working temporarily abroad further impairs the balance through the decline in earned incomes from abroad. At the same time, there are feasible competitiveness reforms that contribute to the country's sustainable convergence and the reduction of its imbalances by lowering the deficit on the income balance. These steps support a positive change in the income of equities through, *inter alia*, an increase in Hungarian companies' FDI abroad.

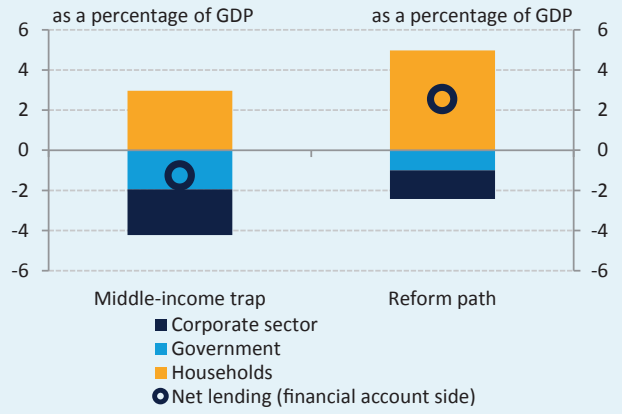
It is worth considering that the significant wage convergence resulting from the reforms **may stop or even reverse the migration of labour from Hungary typical of the past years.** As a result, in nominal terms the rising trend of the earned incomes of those working temporarily abroad may come to a halt. However, the nominal change is offset by the increase in GDP, thus significantly reducing the negative impact on the current account balance.

With competitiveness reforms in place, within the items of the income balance the declining interest balance of foreign loans also contributes to sustainable convergence. Rising household savings, corporate productivity and improvement in the efficiency of the state improve the net lending of these sectors, and thus reduce their net borrowing. As a result, the continued decline in net external debt contributes to the decrease in interest expenditures on foreign loans. These aspects are described in more detail in the following subchapters.

3.6 Financial savings of individual sectors

The sustained net lending of the economy is also reflected in the reforms' positive effect on savings and thus in strengthening financing from domestic sources. The competitiveness reforms to be implemented in the coming years contribute to households' net lending remaining at a persistently high level. With the reforms, the fiscal deficit also remains steadily low. Moreover, by the end of the projection horizon it may turn into surplus. In addition, competitiveness reforms result in lower net borrowing thanks to companies' higher profitability. On the whole, if the reforms are implemented, the expansion in domestic funds results in a persistently positive net lending of the economy, while in the middle-income trap scenario the economy would increasingly rely upon external funds (Chart 3-21).

Chart 3-21: Decomposition of net lending according to the savings of sectors



Note: Average values on the horizon of the projection period.
Source: MNB.

With the competitiveness reforms implemented, households' net lending remains consistently high, and corporate net borrowing may also be lower. In the middle-income trap scenario, the rise in households' investment and consumption expenditures gradually reduces households' savings, which is attributable to the fading of the factors which stimulated households' significant savings following the 2008 crisis as well as to households' increasing loans outstanding. However, on the reform path, the additional income produced as a result of the wage convergence essential for sustainable convergence primarily increases savings, due to the slow adjustment of households' behaviour. Accordingly, in this case households' – and thus the economy's – net lending is expected to be at a high level, which, at the same time, also improves the external–internal structure of the economy's supply with funds.

In the case of companies, initially the funding requirement of the strong investment activity is partly satisfied by the high FDI inflow as well, in relation to the higher labour productivity. As a result of the increase in export market share and lower interest expenditures, the profitability of the sector improves, which may be increasingly reflected in a rise in FDI abroad rather than in the repayment of foreign loans, thus also improving the income balance of the Hungarian economy over the longer term.

In parallel with an increase in households' savings, the reforms that aim at sustainable convergence also support the rising path of net lending via companies' declining net borrowing and the decrease in fiscal deficit. In the middle-income trap scenario, the borrowing of the state increases, which – in conjunction with the private sector's declining savings – results in rising net borrowing of the economy. At the same time, on the reform path the competitiveness reforms aiming to increase the efficiency of the state contribute to the improvement in the net lending of the general government, as they facilitate the reduction of public expenditures and the cost-efficient functioning of the state.

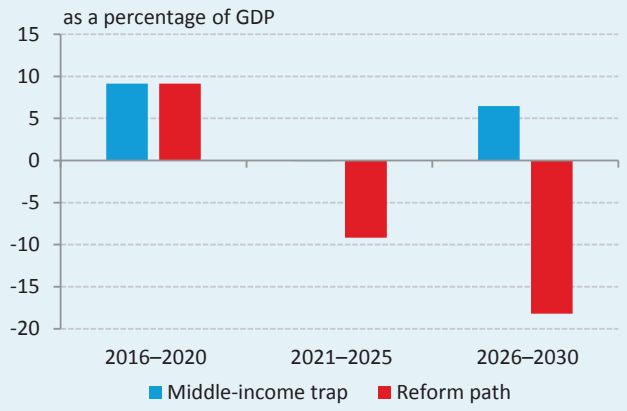
Although wage convergence means higher wage costs for the corporate sector, this effect is offset by the aforementioned competitiveness reforms that boost SME's productivity and thus their export opportunities, and also result in higher profitability and lower net borrowing as well as an overall improvement in net lending for the corporate sector as well.

3.7 Structure of liabilities and net external debt of the economy

On the reform path, as a result of an increase in the weight of internal financing due to the reforms, net external debt will decline in the coming years, and the economy is expected to become a net creditor of the rest of the world – which would be a transitory state only without reforms in the middle-income trap scenario. Concerted reform steps that support the competitiveness of exports are indispensable for lasting trade and current account surpluses. Without them there would be a current account deficit, and net external debt would embark on an upward path again. Examining this aspect from a sectoral approach, with household consumption growing, net borrowing is increasing steadily as a result of the low exports of the less competitive corporate sector and due to the less efficient public sector, entailing a recurring increase in net external debt.

However, the sustainable equilibrium that evolves with the reforms also contributes to a decline in the deficit on the income balance (interest balance) via a decrease in net external debt, which also results in an improvement in the current account balance and the net lending of the economy. However, the net lending position, i.e. negative net external debt, does not mean that the external liabilities of the economy disappear. It only means that the value of loans granted to the rest of the world exceeds the value of loans received from there. Against this background, sustainable convergence is supported by the fact that – instead of the previous debt-type liabilities – FDI funds which support investment and growth and – instead of external liabilities – domestic funds (e.g. from household savings) come to the fore (Chart 3-22).

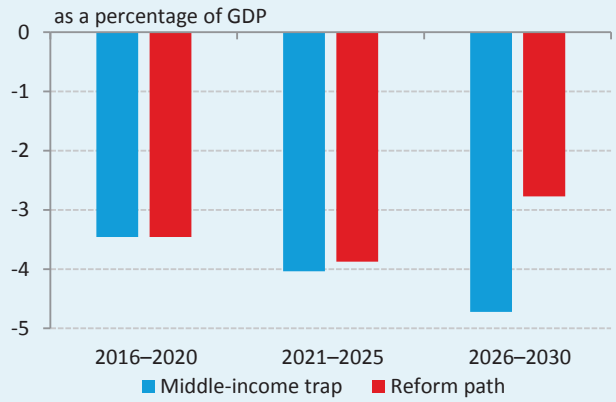
Chart 3-22: Net external debt (average of the period)



Source: MNB.

increase again, and secondly, GDP expansion in a less competitive economy would be slower, also adding to the degree of difference.

Chart 3-23: Difference between GNI and GDP



Source: MNB calculation.

3.8 Changes in GNI

In connection with growth, the most widely used macro-statistical indicator is the change in GDP (gross domestic product). However, this indicator only measures the total product produced on the territory of the country in question, without providing a complete picture of the position of income owners. The GNI (gross national income) indicator, however, measures the size of primary income the residents of the country have. This indicator is derived from the GDP figure by adding to it the primary incomes received from abroad and deducting from it the primary incomes flowing out.

In emerging economies, GNI is typically lower than GDP. The main underlying reason is the cost of foreign funds (foreign direct capital and external debt).[49] **Competitiveness reforms reduce the difference between GDP and GNI** (Chart 3-23). Firstly, the net lending of the country increases considerably, as a result of which the country's net external debt declines to nearly zero, then moves into negative territory, and thus the interest balance paid to abroad improves considerably. Secondly, Hungarian companies' investments abroad are also becoming stronger, and the related capital revenue 'comes home'. As a result of these factors, the primary income balance improves, leading to a decline in the gap between GDP and GNI. **If the competitiveness reforms are not implemented, the difference between the two indicators would increase:** firstly, with the current account balance becoming negative, the country's external indebtedness and thus the interest expenditure paid abroad, would

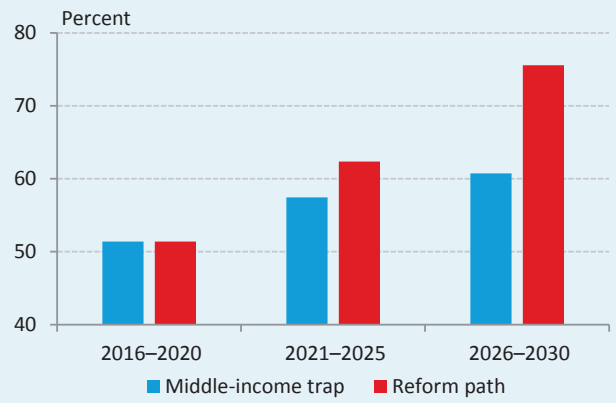
3.9 Trends in lending

The reform measures result in significant structural changes, not only in terms of the real economy but also from the aspect of lending to the private sector. As a result of the increasing productivity and the ensuing expansion in income, credit demand may permanently increase both in the corporate and household sectors. On the one hand, one underlying reason is that in parallel with the improvement in companies' productivity, their investment activity as well as the volume of loans used for investment projects also increases.

On the other hand, the expansion in real wages in a wide range of households may add to the increase in the overall credit volume and the number of borrowing households. All of this is not inevitably coupled with the excessive indebtedness of sectors: the private sector's loan-to-GDP ratio underwent significant adjustment following the crisis and is presently among the lowest in the EU and the CEE region. Hungarian banks currently have significant lending capacities, while the debt cap rules that entered into effect in recent years help to keep individual risk-taking under proper control.

[49] The income paid abroad after foreign direct investments and deducted from GDP during the calculation of GNI.

Chart 3-24: Long-term indebtedness of the private sector relative to the GDP (credit-to-GDP trend, average of 5 year periods)



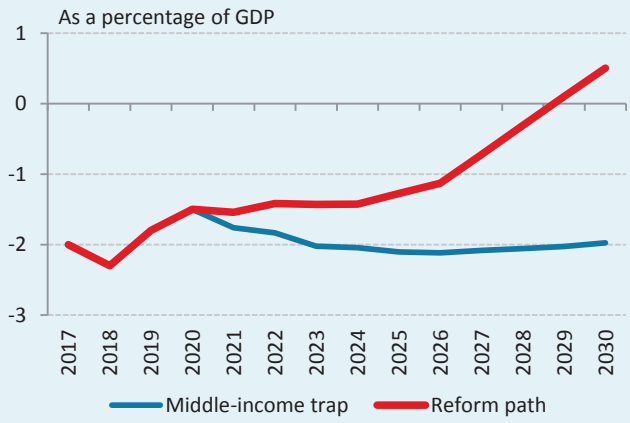
Source: MNB.

To quantify the effects, we followed the methodology described below. We included the projection until 2030 of real GDP calculated according to the macroeconomic assumptions in the trend equations of the structural credit gap,[50] and then from the resulting loan/GDP projection we derived the dynamics of credit expansion. With an annual average 12 percent growth rate of lending calculated on the reform path, by 2030 the private sector's equilibrium indebtedness as a proportion of GDP may rise to nearly 80 percent (Chart 3-24).

3.10 Changes in the budget and the government debt

In our projection, the three main factors that affect the fiscal path are (i) the rate and structure of economic growth, (ii) the changes in risk premia and (iii) government measures. Over this time span, demographic developments do not yet have a major impact on the balance.

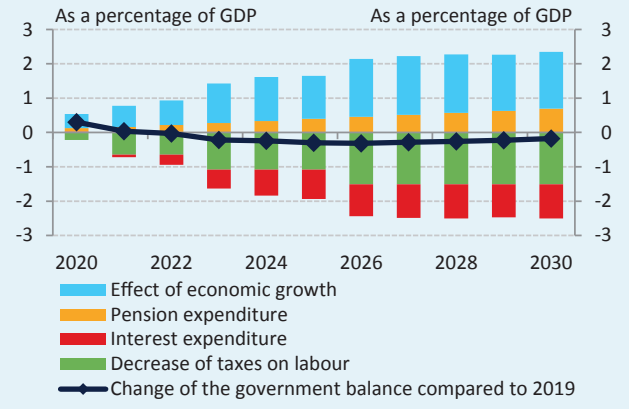
Chart 3-25: Fiscal balance as a percentage of GDP



Source: MNB calculation.

On the middle-income trap path, the fiscal deficit would not change significantly over the long run, but would remain around 2 percent of GDP (Chart 3-25). The budget deficit may initially decline to below 2 percent, but over the long run, with a slowdown in economic growth and a rise in risk premia, the improvement would come to an end. In this scenario, we do not take into account any further measures in addition to the trilateral wage agreement concluded in 2016, and thus the rate of the social contribution tax will gradually decline to 11.5 percent from the previous 27 percent. Over this time scale, pension expenditures as a proportion of GDP may decline as a result of the rising retirement age and due to inflation indexation (Chart 3-26).

Chart 3-26: Decomposition of the cumulative change in the fiscal balance in the case of no reforms



Source: MNB calculation.

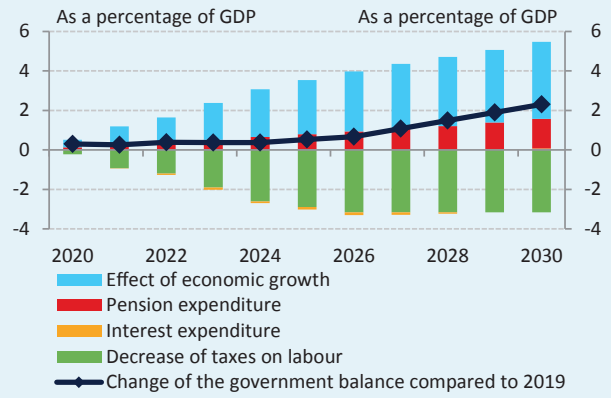
If the competitiveness reforms are implemented, it will make economic growth more dynamic, thus offsetting the tax cuts. Along with other competitiveness measures, we expect the realisation of further reductions of taxes on

[50] For more details see: Hosszú – Körmendi – Mérő (2015).

labour in addition to the trilateral wage agreement concluded in 2016, and thus the tax wedge may gradually decline to 36 percent. As a result of tax and other measures, economic growth may remain persistently high in parallel with dynamic wage increases. Rapid growth and the expansion in tax bases mean additional balance improving revenues for the budget, leading to a favourable spiral as a result of the decline in spreads due to improving prospects.

A balanced budget can be achieved on the reform path prior to 2030 (Chart 3-27). Initially, in view of the reduction of the taxes on labour, the balance will improve only slightly compared to the middle-income trap path. The short-term static fiscal impacts of the tax cuts will be partly offset by the favourable longer-term real economic spillover effects, generating additional tax revenues for the budget via the expanding wage bill and increased consumption. As a result of moderate spreads and declining debt, interest expenditures may remain persistently low.

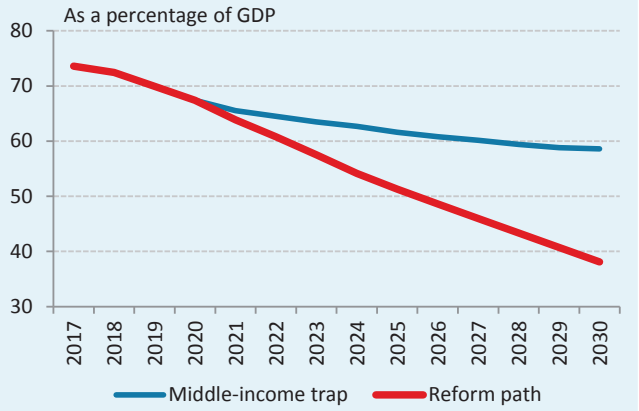
Chart 3-27: Decomposition of the cumulative change in the fiscal balance in the case of the reform path



Source: MNB calculation.

In terms of public debt, implementation of the reforms is necessary in order to achieve the 50 percent target set forth in the Fundamental Law. The middle-income trap path is characterised by declining growth due to lack of competitiveness reforms and by a stagnant fiscal deficit of 2 percent, as a result of which the debt ratio may stagnate around 60 percent following an initial decrease. However, the reforms may ensure the achievement of a persistently higher economic growth, which may allow a 50 percent debt ratio to be reached by the mid-2020s (Chart 3-28). Robust growth also supports the reduction of the debt-to-GDP ratio through the tax revenues and GDP growth.

Chart 3-28: Development of gross public debt



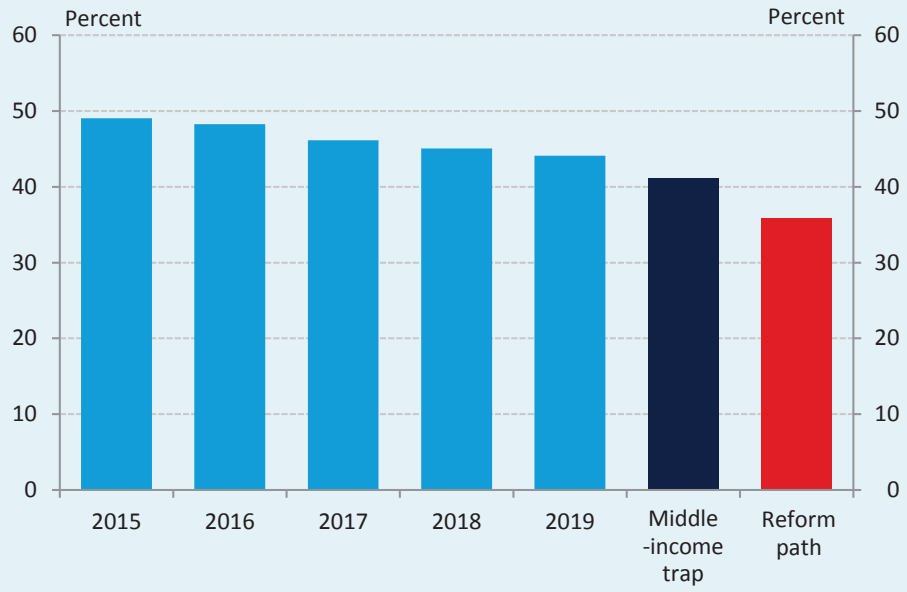
Source: MNB calculation.

Box 3-2: Assumptions concerning the tax measures in the reform path

For Hungary to implement a successful convergence, a further reduction of the taxes on labour is necessary. According to the convergence path outlined by the MNB, if the necessary competitiveness reforms are implemented, domestic net real earnings will double by 2030. Fiscal policy may also contribute to this significant growth with further major reductions of the tax and contribution burdens on wages. Pursuant to the tripartite wage agreement concluded in 2016, the rate of the social contribution tax will gradually decline to 11.5 percent from the earlier 27 percent (the current rate in 2018 is 19.5 percent), although even by the time it is fully implemented, the average tax wedge of childless employees earning the average wage would still remain above 41 percent. This level is still higher than the EU Member States' 2017 average of 40.5 percent.

An additional significant decline in the tax wedge may accelerate the rise in net wages, which, however, requires further tax and contribution reductions, primarily on the employee side. In the short run, the social contribution tax reduces employers' tax burdens, although its impact has a partial spillover into the rise in net earnings, i.e. the government also takes part in the increase in net real wages. Both on the middle-income trap path and on the reform path we assumed that the tax cuts included in the wage agreement will be implemented, and thus they will partly contribute to the increase in net earnings in the case of both paths. At the same time, the reform path contains further significant tax cuts for employees, which are immediately and completely reflected in net wages. As a result of tax reductions in addition to the trilateral wage agreement, a decline in the tax wedge to 36 percent is assumed in the reform path.

Chart 3-29: Average tax wedge in Hungary without reforms and in the case of their implementation



Source: MNB.

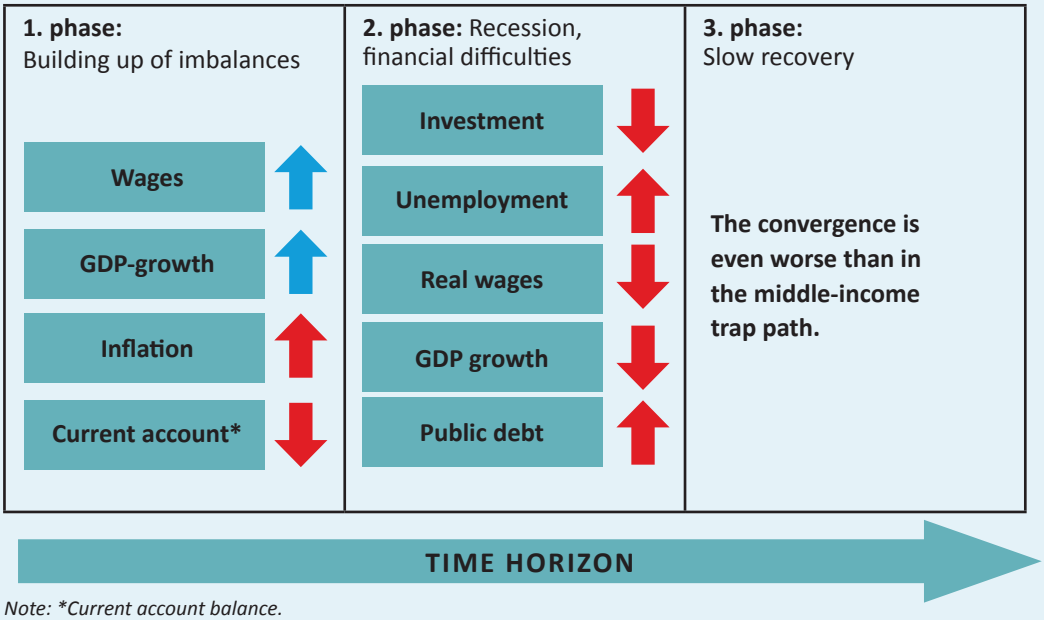
In the short run, tax cuts represent a burden on the fiscal balance, but are mitigated by favourable longer-term real economy developments. As a result of tax cuts, employees' labour supply increases (both in terms of employment, i.e. whether to work or not, and the number of working hours), raising the disposable income of households and thus their consumption. Additional tax and contribution revenues from increasing gross wages and higher consumption ultimately partly offset the negative budgetary impact of the tax cuts. According to Szoboszlai et al. (2018), around one third of a 1 percentage point reduction of labour taxes may be recovered in the short run, and after the slower macroeconomic spillover effects, approximately half of the tax cuts may be offset over a longer time scale. Over the long run, each 1 percentage point decrease in the taxes on labour may contribute to GDP growth by 0.3 percentage points.

Box 3-3: Only reforms implemented along an equilibrium path are real reforms

Two main macroeconomic paths were outlined in the current chapter of the Report. One path is based on the implementation of complete, comprehensive reforms and showed that over the next 12 years Hungary will reach 80–90 percent of the level of development of Austria from the current level of below 60 percent. By contrast, if the reforms are not implemented, Hungary will become stuck in the status of medium development, i.e. per capita GDP and wages would not come closer to Austria. **In this box, we examine an intermediate possibility as well, if reform measures were implemented in a one-sided manner.** In this case, measures popular for economic policy would be implemented, but no major, comprehensive reform measures would be taken. This path – in line with its main characteristic – is called the path of short-winded reforms.

Accordingly, on this path marked by imbalances, the starting point of our analysis is that economic policy implements only the popular measures. The simplest way to describe this is that strong wage increases occur without deep-reaching measures.[51] **However, without serious structural reforms, on this path wage increases diverge significantly from the improvement in productivity.** In the case of this unfavourable path, macroeconomic developments can be divided into three periods: 1) temporary growth in parallel with the evolution of imbalances, 2) a decline in growth as a result of a permanent imbalance, 3) slow recovery (Chart 3-30).

Chart 3-30: Macroeconomic developments of short-sighted reforms



*Note: *Current account balance.*
Source: prepared by the MNB.

In the first period, although the convergence continues as a result of the rise in consumption due to the initially high wage outflow, imbalances gradually build up over time. Wage increases that depart from productivity entail higher inflation. As seen in the mid-2000s, convergence can be maintained only for some years if macroeconomic imbalances evolve. More buoyant consumption raises imports as well, while – without an improvement in competitiveness – export growth does not increase. Accordingly, as a result of Hungary's worsening trade balance, the current account balance follows a negative trend, and deteriorate steadily. In addition, as a result of the wage increases the government accumulates a significant deficit.

Accordingly, unfavourable trends make the country more vulnerable in the second period. Risk spreads surge, and international capital inflows come to a halt. Financing difficulties make the management of public debt more difficult and restrain the investment activity of the private sector. Against the background of evolving macro imbalances, in reaction to the increasing uncertainty and to offset the higher costs, companies reduce wages and the

[51] E.g. a minimum wage increase and raising public sector wages, which thus also put the wages of those in the private sector under pressure.

level of employment, resulting in rising unemployment. Increasing inflation contributes to the decline in real wages, further reducing the level of consumption. On the whole, general aggregate demand falls significantly, and the level of GDP declines.

The fall in revenues due to the recession and the higher financing costs resulting from the surge in yields both point to a deteriorating fiscal balance. To control the increasing deficit and the rise in public debt in order to restore the equilibrium, the budget is forced to carry out a fiscal adjustment. This is how the third period is reached. **And although the current account deficit improves relatively quickly, because of the major fall in imports as a result of significantly declining consumption, complete macroeconomic equilibrium is restored only slowly.** Moreover, the level of total output produced may even be below the middle-income trap path.

On the whole, for the period under review, although the non-comprehensive, only temporary reform measures implemented in conjunction with imbalances are able to reach higher economic growth for a short time, in a couple of years they may result in a major economic downturn and thus in permanent damages to the economy, such as a reduction in the investment rate, the freezing of capital inflows, higher financing costs, a significant increase in public debt, a higher inflation path, an increase in the general uncertainty due to high fluctuations and major social welfare losses. **Accordingly, persistent and continuous convergence requires a comprehensive, broad-based turnaround in competitiveness.**

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4 Financial system

The reform path calls for a financial system that provides sustainable financing for economic growth built on innovation, knowledge and productivity expansion. In the chapter which discussed income traps, two phases were identified in companies' life cycle where access to finance continues to be a problem. One is the start-up phase when firms' assets are insufficient to serve as bank collateral. The survival of innovative, new businesses may be facilitated by an increase in angel investors' capital investments, and deepening market know-how is also an important objective. The entry of mature companies onto the open capital market would also mitigate the financing problems faced by medium-sized enterprises: huge growth potential can be identified on the capital market with respect to both market capitalisation and the number of listed firms. Smaller enterprises may launch bond issue programmes as an alternative method of obtaining external funds, and using households' savings may also become a popular and favourable form of investment among households in the future.

Achieving the credit path which supports the economic upswing presented in the third chapter may entail a substantial expansion in the banking system's outstanding loans (and balance sheet total) relative to GDP. Under the current rules, there is ample leeway for the further expansion of credit. Nonetheless, rapid credit growth occurs in equilibrium only if the real economy expands steadily and in a sustainable manner. The lending boom must affect a larger group of customers, in a sound structure and at the lowest possible cost. If lending rose dynamically without income growth, it would be unsustainable over the long run. The sustainability of the corporate sector's indebtedness may be ensured by access to credit for a broader range of SMEs on the one hand and investment lending which enhances productivity on the other. In this way, bank lending can improve Hungary's competitiveness by boosting efficiency and companies' value added. The guarantee system could also play a major role in increased lending to SMEs, so that even those firms could take out loans that are creditworthy but currently do not comply with most banks' risk appetite.

The subpillar of the Bank System Competitiveness Index (BSCI) developed in 2017 that captures digitalisation in banking shows shortcomings in the development of digital financial channels in an international comparison. Progress made in this respect may affect all participants in the economy. The level of development and spread of digital banking products also requires that banks' internal systems and processes be updated, which may entail a gradual decline in the currently high costs-to-assets ratio. Selling banking products via digital channels may also contribute to a supportive credit path, but technological progress requires an accommodative, rational regulatory environment as well.

Alternative sources of financing currently represent a small share of Hungary's financial system. On the capital market, both market capitalisation and the number of listed firms are below the average of the neighbouring countries. Besides listing, bond issues by non-financial corporations may also be expanded based on international comparisons. Over the long run, increasing the ownership share on the stock and bond market could also raise the value of households' savings. In the case of start-ups, shortcomings are identified in the knowledge about the market and the legal environment, and with respect to the acquisition of funds, the exposure of angel investors should converge towards the EU average.

KEY INDICATOR	LAST VALUE	TARGET FOR 2030	SOURCE
Loan volume, % of GDP	Household: 15% Mortgage: 8% Corporate: 17%	Household: 40% Mortgage: 30% Corporate: 30%	Information from banks
Balance sheet total of the banking system, % of GDP	95%	160%	Information from banks
Credit spread of retail products	Achieving the regional average		Information from banks
BSCI Banking digitalisation subpillar	Rank 25	First half of the ranking	Eurostat, WB
Electronic transactions within all transactions	Retail: 15% Corporate: 60%	Retail: 50% Corporate: 90%	
Processing time of refinancing	25–35 days	2–5 days	Information from banks
Cost of refinancing / average loan amount	4.1–4.7 %	1.5%	Banks' terms and conditions
Operating expenses / total assets	2.4	1.6	MNB, ECB
Share of loans disbursed via digital channels	Mortgage: 0% Consumer: 35%	Mortgage: 50% Consumer: 60–70%	Information from banks
Share of banks offering the option of opening an account online	12.5%	100%	Information from banks
Stock market capitalisation, % of GDP	22%	50–60%	BSE
Number of listed firms	41	150–200	BSE
Share of Hungarian stock owners	Retail: 7% Institutional: 17%	Retail: 11–16% Institutional: 22–27%	BSE
Increasing the volume of non-financial enterprises' bonds	HUF 500 bn	HUF 2.000–2.500 bn	BSE
Existing capital of angel investors on the market	Desired level is at least four times the current value		European Investment Fund

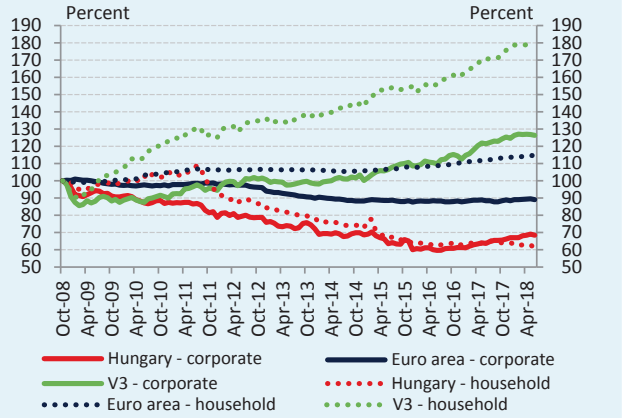
4.1 Facilitating credit convergence

4.1.1 THE DEVELOPMENT OF PRIVATE SECTOR CREDIT

Sustainable economic growth requires the support of the banking system through lending, **especially in the countries where financing is fundamentally bank-based**. European countries are typically characterised by this financial model, and Hungary is no exception. **The literature on the relationship between lending and economic growth identifies several channels, by which – in addition to improving capital allocation – lending contributes to economic growth** (Beck, 2012). These include increased willingness to invest, improved productivity and higher exports. Empirical evidence also shows that countries with more financial depth are usually also more advanced (King and Levine, 1993).

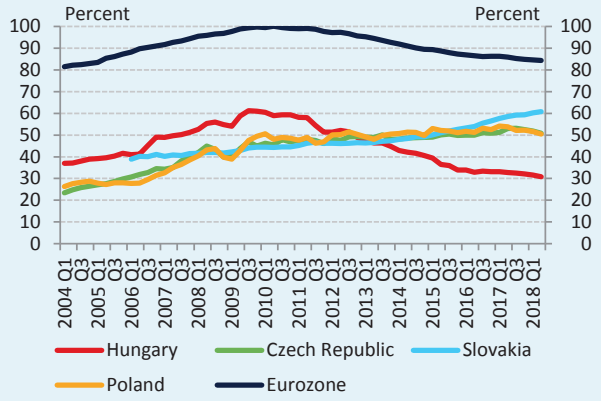
After the outbreak of the 2008 financial and economic crisis, corporate and household credit in Hungary contracted to an exceptional degree, even by international standards, and thus the banking system contributed negatively to real economic growth in this period. **As a result of the annual decline of roughly 5 percent, which lasted for almost 5 years, by early 2013 the corporate portfolio had shrunk to 72 percent of the pre-crisis level** (Chart 4-1). Furthermore, household credit contracted at a pace similar to corporate credit, falling to 78 percent of the pre-crisis level, which – in addition to government measures (early repayment, settlement) – was caused by an aversion to credit that arose among households mainly on account of the negative experiences of FX lending. **Based on the credit-to-GDP ratio, which best captures the depth of the financial system, following this protracted deleveraging Hungary lags behind in an international comparison, and the level of the ratio has also plummeted back to the initial value of the credit cycle that started in the early 2000s (Chart 4-2).**

Chart 4-1: Development of corporate and household loans in a European comparison



Note: October 2008 = 100%. Source: MNB, ECB.

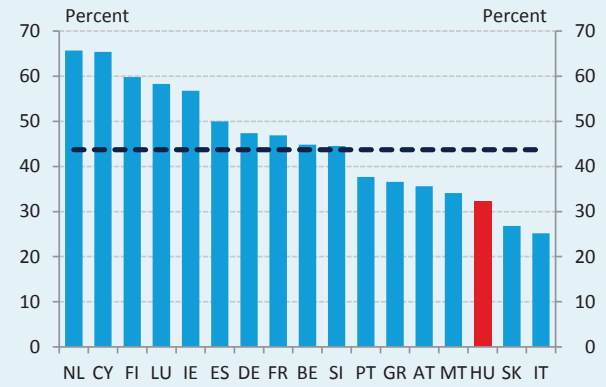
Chart 4-2: Private sector credit as a percentage of GDP in a European comparison



Source: ECB.

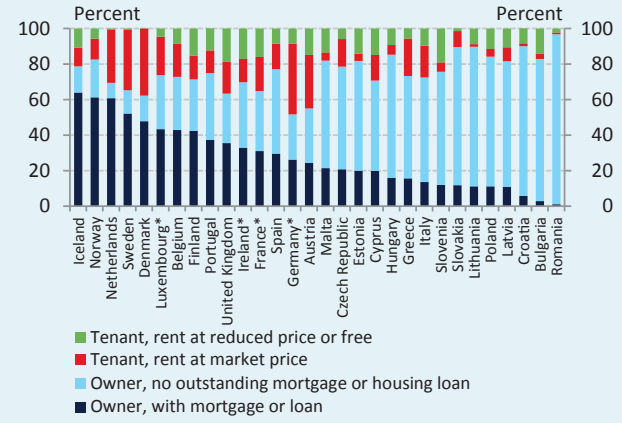
In addition to the exogenous effect of the crisis, there are several endogenous reasons why the expansion of credit prior to 2008 proved to be unsustainable and why it was followed by lengthy deleveraging. Firstly, household lending and the surge in credit occurred through the debt accumulation of a small group of households. **As a result, only a small fraction – merely one-third – of Hungarian households have loans, which is low by international standards** (Chart 4-3)**, and the proportion of those who live in properties for which they pay mortgage instalments is low in a European comparison** (Chart 4-4). Secondly, during the credit expansion, as short-term benefits were exploited, the prudent assessment and hedging of long-term risks was relegated to the background. Most households were indebted in foreign currency with variable (and modifiable) interest rates, which involved excessive interest rate and exchange rate risks. **Moreover, financial deepening was not followed by a sufficient degree of real economic convergence, and income growth fell short of the level necessary for credit growth.**

Chart 4-3: Financial Conditions Index (FCI) and annual real GDP growth



Note: The dashed line shows the euro-area average.
Source: Boldizsár, Anna – Kékesi, Zsuzsa – Kóczián, Balázs – Sisak, Balázs (2016): A magyar háztartások vagyoni helyzete a HFCS felmérés alapján (The wealth position of Hungarian households based on HFCS). Financial and Economic Review, 15/4, pp. 115–150.

Chart 4-4: Distribution based on housing status in an international comparison



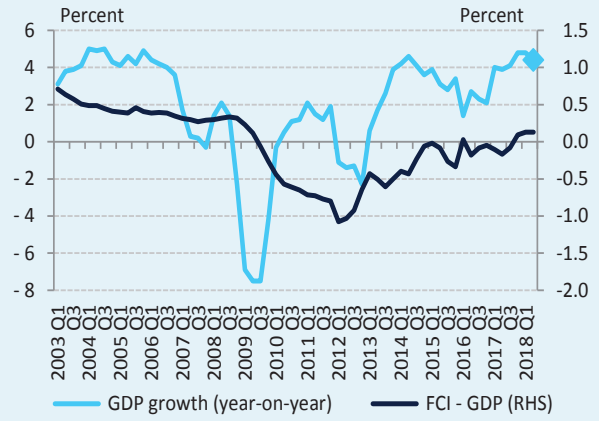
*Note: In the case of the countries marked with an *, the data are for 2016, otherwise for 2017. Source: Eurostat*

4.1.2 CURRENT LENDING DEVELOPMENTS

After the post-crisis contraction in private sector credit, a turnaround occurred in corporate lending in 2016 and then in the household segment in 2017 (Chart 4-4). **In parallel with the expansion of corporate lending as a whole, lending to SMEs is growing at double-digit rates based on transactions.** In the household sector, housing loans have contributed positively to the development of lending since early 2017, while the consumer loan segment has only boosted households' outstanding borrowing since mid-2018. **The latter is a result of the continued contraction in home equity loans extended mainly before the crisis and the dynamic expansion of new uncollateralised loans, mostly in the form of personal loans.**

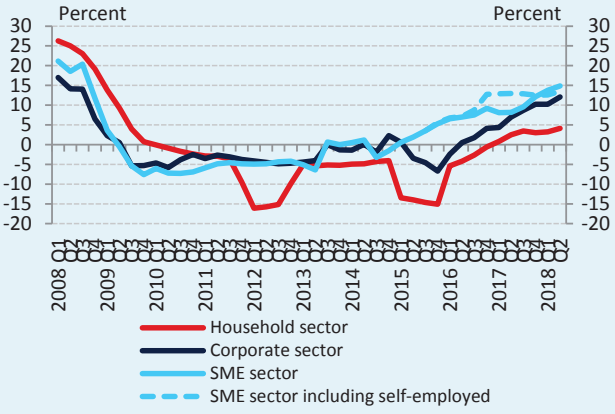
Owing to favourable lending developments, **the Financial Conditions Index**, which summarises supply conditions, **has reached the equilibrium level**; in other words, the banking system currently does not strengthen or weaken the real economic cycle through its lending activities (Chart 4-5).

Chart 4-5: Financial Conditions Index (FCI) and annual real GDP growth



Note: The FCI quantifies the banking system's contribution to the annual GDP growth rate via lending. The 2018 Q2 data for the annual real GDP growth rate is the HCSO's initial estimate adjusted for seasonal and calendar effects.

Chart 4-6: Annual growth rate of lending to households, the corporate sector as a whole and the SME sector



Note: Transaction-based data, prior to 2015 Q4, data for SMEs are estimated based on banking system data. Source: MNB.

In the new lending cycle, it is important that the expansion of lending should not only facilitate macroeconomic developments in terms of volume, but – from a qualitative perspective – it should also occur in an appropriate, sound structure.

Since the start of the new credit cycle, from 1 January 2015, debt cap rules have been in effect in the household segment. These prevent the accumulation of uncovered exchange rate risk that disappeared from households' balance sheet thanks to the FX loan conversion to HUF. **The rules also prevent excessive indebtedness by capping the loan-to-value ratio**

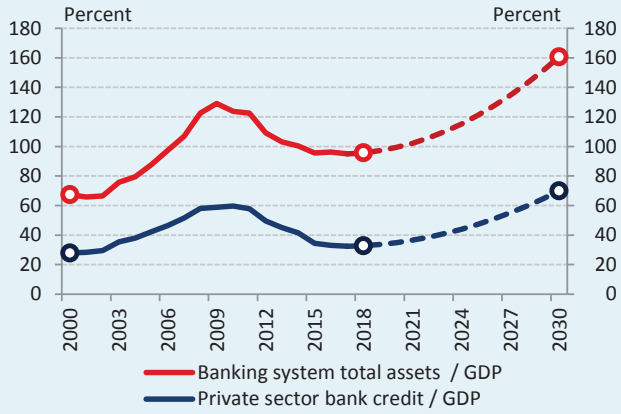
and the payment-to-income ratio. However, in the current low interest rate environment, debtors face a potential risk with longer-term loans that are typically disbursed for housing purposes if they take out variable-rate loans or loans with an interest rate fixed only for a short period. **In order to address this, the MNB introduced the Certified Consumer-Friendly Housing Loan product certification, which allows housing loans to be taken out in a financially conscious and comparable manner, at favourable conditions.** Moreover, the central bank also encourages indebtedness with longer-term, fixed-rate loans through the modified debt cap rules: with an unchanged loan-to-value ratio, which is not significantly constraining in the context of rising house prices, PTI limits differentiated by interest fixation period were introduced from 1 October 2018.

In a low interest rate environment, predictable repayment obligations are also central for the corporate sector over the long run. After the phase-out of the Funding for Growth Scheme, the share of fixed-rate loans dropped from 80 percent to 20 percent in the case of forint-denominated SME loans. **In 2019, the MNB will launch a new credit programme called FGS Fix to help manage the interest rate risk of the micro, small and medium-sized enterprise sector. The programme will provide fixed-rate funds at an interest rate of up to 2.5 percent to SMEs until the HUF 1,000 billion allocated for this purpose is exhausted.**

4.1.3 THE CONDITIONS OF CREDIT CONVERGENCE

The banking system's supportive role via lending is crucial to the success of real economic convergence. Real and financial convergence should be achieved at the same time, and real economic growth targets cannot be achieved without financial deepening. The sustainable real convergence that is desired entails a parallel expansion of the financial system, which is possible if the size of the banking system and the bank credit volume of the private sector grow relative to GDP. **On the convergence path, the balance sheet total relative to GDP may be as high as 160 percent by 2030, while the private sector's credit relative to GDP may double to 70 percent** (Chart 4-7). This can be achieved if corporate credit grows at an annual rate of 15 percent on average, and household credit – especially housing loans – expands at a rate of 18 percent. Of course, credit convergence can only be achieved in a sustainable manner if the fundamental real economic conditions are all met at the same time.

Chart 4-7: Indicators of the banking system's penetration in the context of real convergence



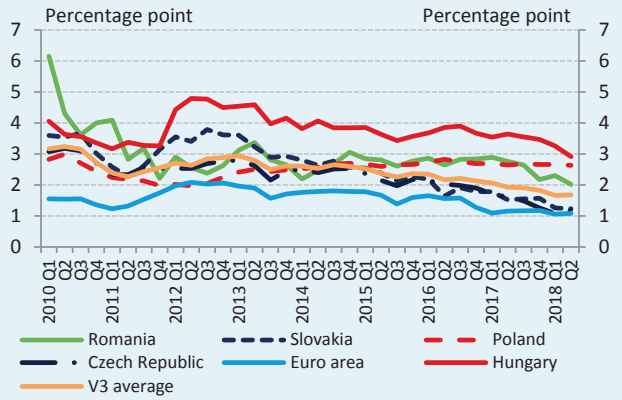
Source: MNB.

A rising level of banking system penetration will be able to support real convergence over the long run if it is realised in a sustainable structure. In the case of household credit, this principally means borrowing with interest rates fixed for the long term and taken out in forint, as a result of which the interest rates on loans and the exchange rate risk can be kept low. **The crisis and its aftermath considerably expanded central banks' room for manoeuvre, and therefore the regulatory authorities are able to efficiently reduce risks.**

In addition to a sound structure, deeper credit penetration also requires bank loans to be widely available, which assumes lower bank spreads. **In line with the MNB's efforts, spreads on Hungarian housing loans neared regional spread levels** (Chart 4-8)**, which must be maintained for credit convergence.**

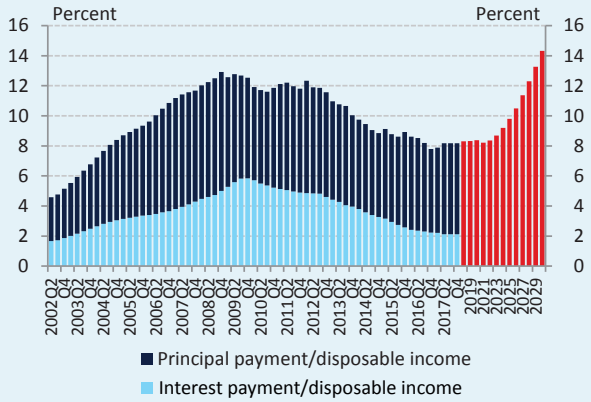
As pointed out in Chapter 1.2.6 (Financing trap), funding issues were identified mainly at the start of companies' life cycle (capital raising) and the mature phase (capital market). From the banks' perspective, the sustainability of the corporate sector's indebtedness may be ensured by access to credit for a broader range of SMEs on the one hand and investment lending to enhance productivity on the other. In this way, bank lending can improve Hungary's competitiveness by boosting efficiency and companies' value added. **The Hungarian SME sector mainly requires long-term, fixed-rate forint loans to achieve this. Currently, the share of such SME loans is low, even by international standards, and therefore a major portion of firms cannot enjoy the benefits of the current favourable interest rates over the long run.**

Chart 4-8: Interest rate spreads in an international comparison for housing loans provided in domestic currency



Note: APR-based, smoothed spread over the 3-month BUBOR in the case of variable-rate housing loans or for loans with a rate fixed for up to 1 year, while in the case of housing loans fixed for a period longer than 1 year, the smoothed spread over the relevant IRS. Source: MNB.

Chart 4-9: Households' debt service



Source: MNB.

Rapid credit growth occurs in equilibrium only **if the real economy expands steadily and substantially**. Lending, incomes and investment need to increase in tandem, as **all three are necessary conditions** of sustainable convergence, **but none are sufficient in themselves**. The lending boom must affect (1) **a larger group of customers**, (2) in a **sound structure** (3) at the **lowest** possible **cost**. If lending rose dynamically without income growth, it would be **unsustainable** over the long run. **The MNB stands ready to mitigate risks with its microprudential and macroprudential instruments.**

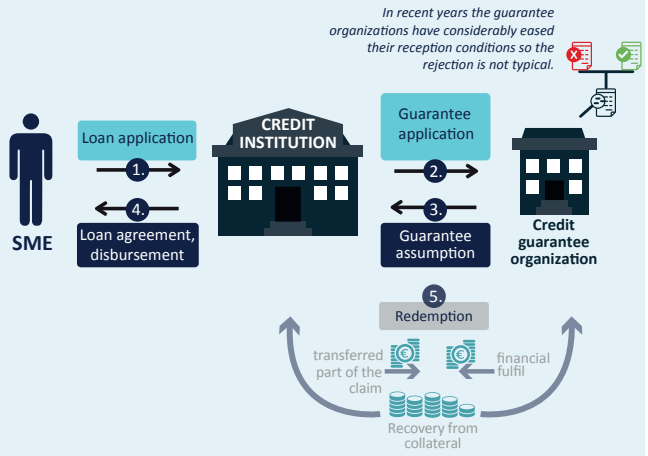
For the credit convergence path to be sustainable, borrowing needs to be broader based. On the convergence path, households' outstanding borrowing relative to GDP is estimated to be as high as 40 percent by 2030, with a roughly 30 percent contribution from housing loans. In the context of the current yield curve and income convergence on the macroeconomic path, the payment-to-income ratio would rise from 8 to 14 percent by the end of the time horizon (Chart 4-9). Although this would be slightly above the value before the 2008 crisis, it would not be exceptional in an international comparison (e.g. it is currently higher in Denmark, the Netherlands and Norway) and it would have a sounder structure. Furthermore, if wage convergence is achieved, households may have more leeway in spending their disposable income: therefore, the equilibrium debt service burden is assumed to be higher than prior to the crisis. It is important to note, however, with the assumed credit dynamics that households' debt service will be sustainable only if it is coupled with broader-based borrowing and with instalments that are predictable over the long run.

4.2 The role of an efficient guarantee system in corporate lending

Institutional guarantees play a major role in facilitating access to credit for SMEs, which form the backbone of the economy. Ideally, guarantee institutions enable the financing of viable customers/transactions that would not receive funds, or not in a sufficient amount, in the absence of a guarantee, by mitigating the credit risk of financial institutions.

Under the suretyship undertaken by the guarantee institution, it **assumes the debt obligation up to the extent of the guarantee if the customer defaults** in exchange for a fee paid by the debtor, thereby reducing the bank's credit risk. If the debtor defaults and the guarantee is claimed, the guarantee institution pays the bank the debt up to the amount of the guarantee. The amount received later from any other collateral securing the transaction is divided between the institution and the credit institution in proportion of their outstanding claims (Chart 4-10).

Chart 4-10: The process of guarantees



Source: MNB.

One important element of guarantee schemes is **risk sharing**, because this determines the amount of losses borne by the parties if the guarantee is honoured. There are currently two guarantee institutions in Hungary that **provide guarantees usually with a counter-guarantee from the state**. The amount of such is determined by the state in the Budget Act and is capped at **85 percent** of the guarantee, which must **not exceed 80 percent of the outstanding debt**. (In addition, they may also undertake a surety guarantee at their own risk, without the state's counter-guarantee, and with the EIF's counter-guarantee.) The Act includes three more stipulations that allow the state to influence the opportunities and room for manoeuvre of institutional guarantors: i) the maximum amount of guarantees that may be undertaken; ii) the maximum amount of the state's counter-guarantee that may be drawn down in the case of a claim; iii) the maximum amount of the guarantee fee subsidy that may be used in the given year. Although in recent years the budgetary appropriations did not present an effective constraint on the activities of guarantee institutions, it is crucial that these stipulations do not hinder the efficient functioning of the institutions in the future as well.

In recent years, the guarantee institutions have taken several measures to encourage the use of guarantees (lower prices, swifter approval procedures, electronic administration), and in parallel with these **the volume of guarantees has expanded considerably**. However, from the perspective of the effective distribution of state funds, it is crucial that the institutional guarantee should support the borrowing of customers that have **limited opportunities from a risk and/or collateral perspective but are nonetheless creditworthy**, thereby satisfying the **most important requirement of an efficient guarantee scheme: additionality**. Guarantee institutions fulfil their role/function appropriately if the institutional guarantees help those SMEs access financing that would not have received funds, or not the necessary amount, without a guarantee.

Nevertheless, experience shows that **currently a portion of the guaranteed portfolio cannot be considered additional**. One of the main reasons for that is that credit institutions also involve guarantees in transactions that would have been completed even without one, so actually a **"double securing"** is provided. In such cases, guarantees are mostly used to lower banks' capital requirements, which does not produce macroeconomic results in the absence of any value creation. The other reason is that banks use the guarantees to **relieve** certain customers **from providing their own collateral**. This entails a moral hazard, because customers do not risk their own assets. Accordingly, the current system of guarantees would be more efficient if the share of the additional portfolio was increased, which can be **achieved by facilitating the access to credit of the companies considered riskier from a lending perspective**.

The guarantee institutions have recently eased their acceptance requirements, but this in itself is not sufficient to achieve the desired objective. **Credit institutions** should also be **more open towards the riskier segment**. This can be facilitated by exploring the opportunities of being more risk-tolerant, and the options for introducing easing measures to incentivise credit institutions towards this goal should also be examined. It is also important to address the firms that fail to attract the attention of credit institutions because they believe, based on their own assessment or earlier experience, that they would not receive the necessary funding. In this regard, **marketing tools** should be considered that help **promote the use of bank loans with a guarantee** among the targeted players.

4.3 Enhancing digitalisation in banking

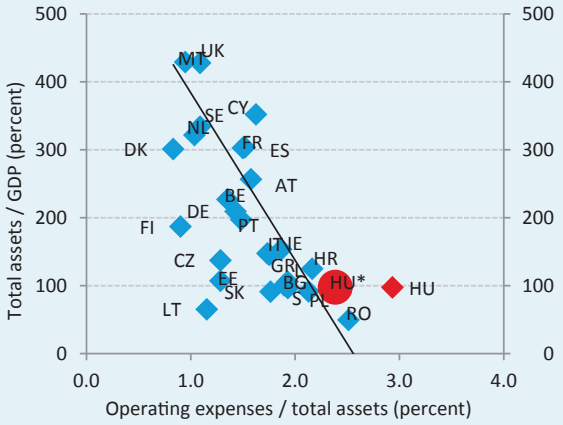
4.3.1 ASSESSMENT OF DIGITALISATION IN BANKING IN HUNGARY

In the banking system, just like in all sectors of the economy, it is useful to utilise financial and other resources as efficiently as possible. New technological innovations pave the way to realising operational tasks faster and at lower costs,

and the standard in service provision set by other sectors must be met to satisfy customers' evolving needs. In recent years, these developments typically meant the digitalisation of the remaining paper-based internal processes, the modernisation and standardisation of obsolete systems and, to a smaller extent, the introduction of services based on modern technologies, such as the Internet of Things, machine learning, artificial intelligence or cloud computing. **Nonetheless, the improved cost efficiency arising from digitalisation enables the implementation of further investments or the reduction of credit spreads.**

The Hungarian banking system lags behind in terms of digitalisation, which is also reflected in cost efficiency. In the years following the financial crisis, the high level of non-performing loans eroded bank profitability, and large-scale loan-loss provisioning reduced banks' capital buffer. This not only undermined the capital and income position of banks, it also tied down human resources in crisis management. As a result, the Hungarian banking system has fallen behind in developments and thus also digitalisation relative to other sectors. Consequently, it is a laggard not only among European countries, but in the narrower region as well. Partly on account of the lack of digitalisation, the operating expenses of the Hungarian banking system are high by international standards. **While the proportion of operating expenses to assets was 1.6 percent in the EU in 2017, the Hungarian banking system's corresponding value was 2.4 percent adjusted for the special taxes (Chart 4-11).** The goal should be to reduce the operating costs to the EU average.

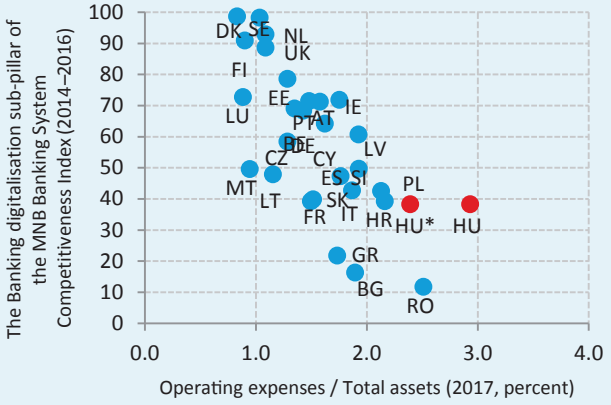
Chart 4-11: Banking system assets and operating costs in EU Member States



Note: In certain countries, operating costs may include some or all of the given countries' bank levy. Based on the 2017 consolidated IFRS bank data. HU refers to data without foreign affiliates, and the bank levy and the transaction tax, which are included among operating costs.*
Source: MNB, ECB.

One of the primary tasks of the banking system is to operate the financial infrastructure: therefore, it plays a role in the day-to-day functioning of the economy as a whole and also, indirectly, in the reduction of the shadow economy. Although cash use allows a wide range of payments to be settled, which may often provide a sense of security to the public, a greater spread of digital payments is important in order to tackle the underground economy. **The Banking digitalisation subpillar of the MNB's Banking System Competitiveness Index is good at capturing the utilisation of digital channels.** The subpillar integrates a total of four international indicators, three of which quantify the share of digital payment channels while the fourth one quantifies the proportion of Internet banking. **Hungary came in 25th place in the EU ranking of the composite index. If countries' values are compared to their banking systems' costs-to-assets ratio, there is a clear-cut relationship (Chart 4-12).**

Chart 4-12: Relationship between the operating costs-to-assets ratio and digitalisation

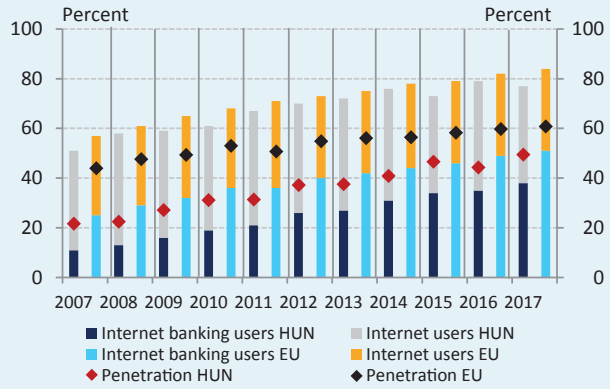


Note: The operating costs-to-assets ratio is based on consolidated data, HU is adjusted for unique effects (foreign subsidiaries, state levies). The indicators of the subpillar include the Share of people using Internet banking, the Share of people conducting or receiving digital payments, the Share of people conducting mobile payments and the Share of people conducting online payments.*
Source: MNB, ECB, CBD, Eurostat, WB.

Out of the four indicators, Hungary's banking system shows average performance from the perspective of the share of mobile payments, while it lags behind in terms of the other indicators. For example, it is ranked 21st in the share of people using Internet banking. **Exacerbating the situation is the fact that certain countries among the laggards are steadily and substantially below the EU and CEE average, but several CEE countries, especially the Baltic States, are around or above the thus lower average.** The situation does not improve much even when the share of Internet banking users is examined in the narrower group of Internet users. Hungary was 21st in this respect in 2017, and despite the gradual progress in recent years, the development could

have been faster in the light of Hungary's relatively low initial level (Chart 4-13). **The spread of digital channels captured by the subpillar can be mainly improved by enhancing the quality of services and deepening the infrastructure, and the modernisation of the systems built around the services may also boost cost efficiency.** Of course, the transition can be gradual because it is not necessary a benefit to customers if administration processes abruptly change. Therefore, besides the usual solutions, banks should engage in a sort of education about their services.

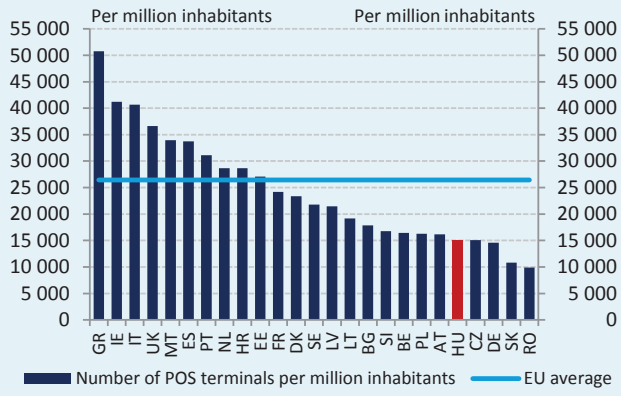
Chart 4-13: Internet banking penetration in Hungary and the European Union



Note: The penetration shows the share of internet banking users among internet users.
Source: Eurostat.

In order to reduce the use of cash, card payments should be made generally available. In this respect, the spread of POS terminals should be examined, in which Hungary also lags behind the EU average (Chart 4-14). It should be noted though, that the Visegrád countries usually perform poorly in this ranking, and Hungary has shown remarkable growth in terms of the number of terminals per one million residents and now comes close to the level of several advanced countries. Moreover, the increasingly popular contactless payment is generally available with the newly installed terminals, which may further promote mobile payments.

Chart 4-14: Number of POS terminals per one million residents in an international comparison

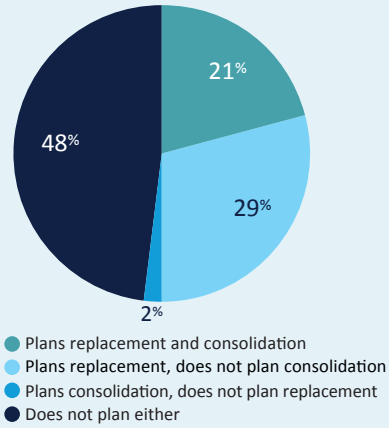


Note: Luxembourg was filtered out of the international ranking due to its exceptionally high value (281,920.881).
Source: ECB.

Currently, there are few innovative products integrated into banking operations. Most FinTech innovations appear in the field of payments, as roughly 80 percent of banks have introduced or plan to introduce mobile payment solutions or payment initiation services. As PSD2 enters into force, new avenues open up for third party payment service providers, which helps to facilitate the spread of account information services and personal finance management services. **Another key field is the digitalisation of traditional banking products and processes and steering them online, for example online personal loan applications and account opening.** But these are currently available at only a few banks, and there is still room to expand online services. All unsecured credit transactions should be made available online, and all banks should offer online account opening.

Utilisation of opportunities for cooperation is hindered at many institutions by the complexity and obsolescence of the core systems (Chart 4-15). The complexity of banks' IT systems is reflected in the fact that depending on the number of services available, several core systems may be used at the same time. Besides the account management system, many banks employ a collateral management system, a CRM system, a securities settlement system and a separate data warehouse. Standardisation of the systems is a complicated task, and therefore many banks do not even plan to attempt it. **The core systems can also be considered outdated, and their development is hampered by the fact that several of them include a system component that is no longer supported by the manufacturer.** Connecting FinTech solutions to the main systems is often possible only by introducing a middle layer, which may compound the complexity of the systems, and continuing to operate obsolete systems may entail supervisory and systemic risks.

Chart 4-15: Plans to change and standardise banks' core systems



Source: MNB, based on banks' responses.

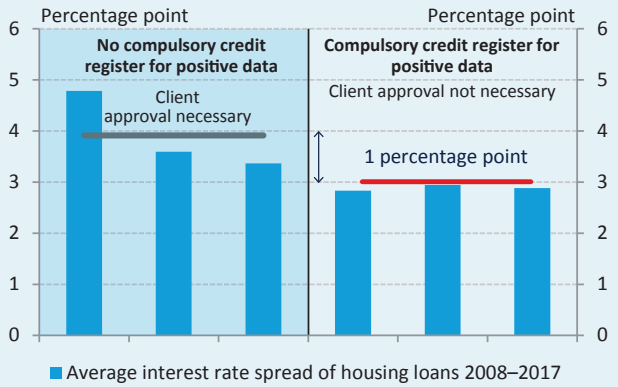
4.3.2 OPPORTUNITIES TO IMPROVE EFFICIENCY IN LENDING PROCESSES

The spread of digitalisation could also help boost the share of refinancing by potentially cutting customers' costs and the time they spend on it. Still, it must be borne in mind that on the customer side, **personal advice and contact** may still be important in the case of highly complex and sophisticated financial products (e.g. mortgages). Therefore, in such cases, the automated and digitalised administration could mainly play a role in the preparation and follow-up phases. However, in the case of simpler products (e.g. consumer and personal loans) the goal is to achieve full digitalisation.

The current practice of providing proof of income from the employer is convoluted and opens the door to misconduct. In the current practice of credit applications, customers need to spend much time on acquiring proof of income from their employers, while banks must commit resources to checking the information provided. The creation of a central database from which online income certificates based on employers' or payers' reporting could be queried would make lending faster, simpler and more reliable, and it would pave the way for the use of digitalisation solutions.

In the current model, positive credit history information in the Central Credit Register is shared with the consent of the borrower, which does not provide fully efficient support to credit assessment processes. Expanding the requirement to share positive information as well as negative information would help the full satisfaction of the debt cap rules, support the spread of digitalised administration, promote the reduction of the administrative costs related to borrowing and could help to **cut interest rate spreads by eliminating the competitive disadvantage of lenders which do not have previous contact to customers** (Chart 4-16). Furthermore, rationalisation of the processes may also foster growth in lending via digital channels and thus facilitate expansion in a sound structure.

Chart 4-16: Average interest rate spread of housing loans (2008–2017) by access to the credit information system



Note: In the case of Romania, the data are available from 2009 Q3.
Source: MNB, national central banks.

In Hungary, the proportion of refinancing is very low due to the long processing times, the high costs and the lack of financial awareness. Refinancing takes 30 working days on average (if the customer cooperates), while its costs may be around HUF 400,000 in the case of a principal sum of HUF 10 million. The main cost item in refinancing is the prepayment fee, which is capped at less than 1 percent in Hungary's regional peers, while it is **1.5 percent in Hungary, and even 2 percent for mortgage bond covered constructions**. Other major cost items include valuation and the amount due to the notary public. Moreover, the lack of information collected by customers and their lack of financial awareness also hampers growth in refinancing. **Although in the case of the increasingly popular Certified Consumer-Friendly Housing Loans these hurdles appear in a less pronounced manner, there seems to be more room for improvement with respect to the share of refinancing** (Chart 4-17).

Chart 4-17: Refinancing a general loan and a Certified Consumer-Friendly Housing Loan (CCHL)

	Average residential mortgage loan	CFHL
Property valuation	10–15 days	10–15 days
Assessmenet of creditworthiness	15–20 days	10–15 days
Total process	30–40 days	25–35 days
Prepayment fee	1,5–2%	1%
Total cost	~350–400 thd HUF	~270 thd HUF

Source: MNB collection, based on bank's conditions.

Information asymmetry and the lack of appropriate central databases hinders the digitalisation of lending processes. More efficient, rationalised lending processes may foster the expansion of credit at a faster pace than today but still in a sound structure, which would be necessary for sustainable convergence.

4.3.3 FINANCING CONSTRAINTS AND THE REGULATORY ENVIRONMENT IN VIEW OF THE CHALLENGES OF DIGITALISATION

The small size of the FinTech market in Hungary scarcely supports the generation of new ideas. In recent years, several venture capital funds have invested in FinTech firms. **Incubation, i.e. tending to companies, is performed by Hungarian companies with a 3- to 6-member expert base, and a capital injection of between HUF 20 million and HUF 500 million.** The composition of the team in FinTech initiatives is important to the decision-makers in venture capital companies, but there are few candidates with a sales potential, i.e. the IT, financial and sales skills rarely go hand in hand in the thinking of new start-ups, which makes it difficult for them to cooperate with banks as well. The lack of legal and regulatory knowledge is a general problem among start-ups. What is more, the lack of past data and experience also hinders access to bank funds.

The absence of regulation taking into account innovative technologies also constrains the full-blown digitalisation of the financial sector. Regulatory authorities play a decisive role in supporting the spread of innovations that are important to financial intermediation. However, the current set-up of the regulatory framework fails to appropriately integrate the solutions that promote financial innovations based on digitalisation. The stipulations inhibiting innovation should be explored broadly, and an appropriately flexible legal basis should be created for the operational framework. However, in overhauling the system, the regulatory authority should also strive to create a level playing field for banking and FinTech players.

Regulation is not prepared to integrate the latest technological solutions. Several pieces of legislation require signing on paper and the availability of a paper-based document, and the rules on written records are also not straightforward in market practice. Therefore, biometric identification and contracting cannot spread at an appropriate pace. The integration of newly implemented innovative technologies actively being used in other sectors is also not ensured in all cases.

The current customer identification rules required when using financial services hamper switching between banks easily and the spread of electronic services. In accordance with the relevant legislations, service providers are responsible for identifying new customers and verifying the identity of previously identified customers when conducting transactions linked to remote customers. Compliance with the strict requirements entails considerable costs to the service providers, especially in the former case. It also significantly hampers efficiency that the range of authorised remote identification techniques and technologies is limited, and therefore not much progress is occurring in utilising the electronic opportunities inherent in modern personal identification documents. This hinders the appropriately wide use of digital solutions and thus the realisation of the potential rise in cost-efficiency.

The credit application process of appropriately identified customers still involves much paperwork and time-consuming administration. Although many banks offer the opportunity of an online pre-assessment, the whole process has been fully digitalised at only one or two credit institutions. Promoting online applications not only reduces the use of branches but is also expedient because currently the online platform of several financial enterprises may be a fast and convenient alternative for customers compared to banks' more complicated credit application processes. This could significantly widen the range of banking or other financial services available online.

The current legal framework does not adequately support the large-scale adoption of innovative solutions. The market entry of the players offering new services is often made very difficult by the regulatory requirements related to administration, reporting, data management and the IT infrastructure. In the case of specific solutions, the high

costs and the inflexible regulatory environment may pull back innovative initiatives even in the case of incumbents. Moreover, especially for new market entrants, the broader access to existing information sources is often fraught with difficulties, which may hinder the introduction of innovations to the market.

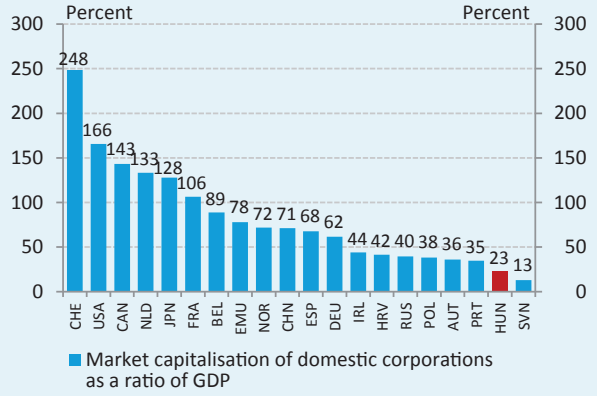
4.4 Widening the capital market

4.4.1 CURRENT STATE OF THE HUNGARIAN STOCK EXCHANGE

A mature capital market and stock exchange are one of the pillars of a competitive, innovative economy. A well-functioning stock exchange helps equity and bond financing, which is critical especially for companies that are excluded from bank lending and during a slowdown in lending. **A healthy balance between bank loans and the capital market reduces firms' dependence on bank lending (which is very typical in Hungary nowadays, apart from a few large corporations), and it makes financial intermediation more efficient, businesses more competitive and economic growth more sustainable.** Due to the uncertainties surrounding the European Union funds available after 2020, it is even more important now that – in addition to bank loans – the capital market should also be widely available for financing. The stock exchange requires companies to operate transparently and efficiently, which also contributes to the reduction of the shadow economy. **Furthermore, the development of listed firms with their headquarters in Hungary enables regional expansion through stock market funding.**

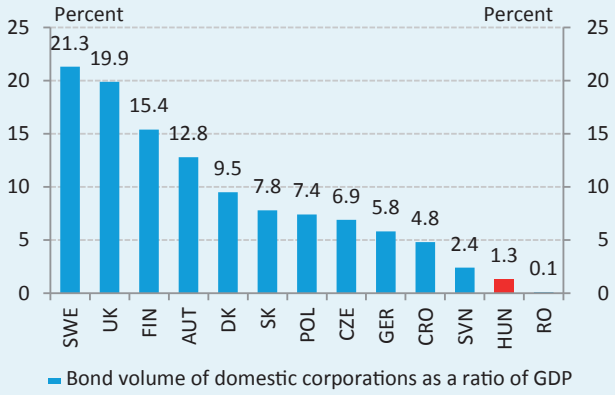
The Hungarian equity and bond market's economic role is marginal in an international comparison, which is mostly reflected in the number of listed companies, their market capitalisation and the low level of Hungarian businesses' bonds relative to GDP. **The market capitalisation of the Budapest Stock Exchange is less than one quarter of the gross domestic product** (Chart 4-18)**, and over 80 percent of the total market capitalisation is derived from the shares of three large enterprises.** In addition, Hungarian companies issue listed credit instruments only rarely, and the **total volume of bonds is hardly over HUF 500 billion or 1 percent of GDP** (Chart 4-19).

Chart 4-18: Hungarian listed companies'market capitalisation in an international comparison, % of GDP, at end-2017



Source: World Bank.

Chart 4-19: Bonds issued by Hungarian non-financial corporations in an international comparison, % of GDP, at end-2017



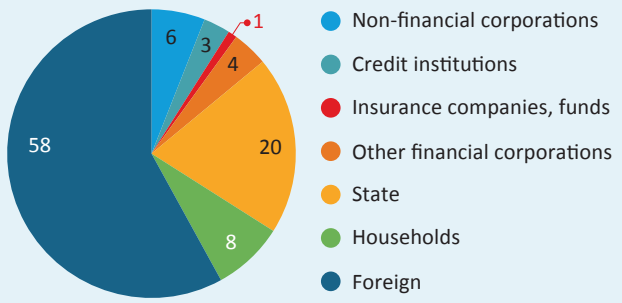
Source: Eurostat.

The marginal role played by the capital market in the Hungarian economy is due to both supply- and demand-side frictions. **On the supply side, there are several factors behind companies' low willingness to enter the market.** Firms' fault can be recognized in their wariness of publicity and transparent functioning and the lack of professional knowledge necessary for appearing on the capital market. In addition, due to the lack of economic incentives for listing and the difficulties in the laws related to the issue process, the competitiveness of capital market financing is lower in comparison with that of bank lending.

On the demand side, the greatest problem is the low willingness to invest by Hungarian institutional investors and the public. **Merely 13 percent of the shares issued by non-financial corporations are owned by Hungarian institutional investors and households (Chart 4-20)**, and their proportion

should be increased to achieve a stable stock exchange based on internal financing.

Chart 4-20: Distribution of ownership of the shares issued by Hungarian non-financial corporations at the end of 2017



Source: MNB.

The main reason behind the subdued interest in the Hungarian equity market is not the lack of capital, but a general distrust in the capital market and its institutions and the lack of incentives supporting equity investments. Moreover, the public's financial awareness should be enhanced and self-care should improve so that capital market deepening does not become constrained on the demand side.

4.4.2 SPECIFYING THE OBJECTIVES NECESSARY FOR THE 2030 MACROECONOMIC PATH

Having been launched in 2016, the strategy of developing the stock exchange, which is now in Hungarian hands, is around the halfway mark. However, the domestic supply and demand side should be stimulated more to further deepen the capital market, and the state may play a major role in this. The supply side must strengthen considerably until 2030, on both the equity and the bond market. **In parallel with real economic convergence, stock market capitalisation should rise from its current 22–23 percent level to 50–60 percent of GDP.** Equivalent in value to this goal and also important in order to avoid excessive concentration is to **raise** the number of listed firms to **around 150–200**. This could be mainly achieved by the listing of the medium-sized enterprises prepared for this and state-owned enterprises. Utilisation of the capital market should also increase in terms of loan-type funds, **and in connection with this the bond portfolio of non-financial enterprises should reach HUF 2,000–2,500 billion**. To this end, households' equity holdings should be expanded to 11–16 percent as seen in the countries with more mature capital markets, **while Hungarian institutional investors' share should increase to 22–27 percent relative to stock market capitalisation**.

A sound financing structure means that the external financing of businesses does not depend too much on either bank financing or capital market financing. **Currently, almost 90 percent of Hungarian companies' financing comes from banks, which indicates a one-sided financing structure.** The banking system's operation is procyclical, and therefore a mature capital market is needed that provides an alternative to companies for acquiring funds during a slowdown in lending.

4.5 Capital raising by start-ups

4.5.1 CAPITAL RAISING PROBLEMS FACED BY START-UPS

Small and medium-sized enterprises (SMEs) are key in sustainable convergence. From the perspective of SME financing or their access to external funds, young companies should be differentiated from mature businesses. **Young firms are small**, and a large proportion of them cease their operation soon. Providing bank financing to start-ups entails huge risks to credit institutions because the former has no meaningful economic past, both their bankruptcy rate and the number of failed firms are high, which is exacerbated by their limited ability to provide collateral. **Due to the high funding risks, start-ups are usually excluded from the market for bank loans.**

One option for acquiring funds instead of bank loans is to raise capital at institutions specialising in this. Among new companies, the capital-raising opportunities of innovative businesses (with high growth potential) are adequate, but the issues of start-ups engaged in traditional activities related to the acquisition of funds can be attributed to both supply-side and demand-side factors. Entrepreneurs are usually overly optimistic regarding the projected earnings potential of their ideas which they seek to implement, while investors focus on the risks of implementation. **The access to financing** necessary for growth **may be hampered** by demand-side constraints such as the lack of capacities or competencies related to acquiring the funds, which is most readily observable in the case of administrative tasks and the preparation of business and financial plans. Another constraint is that obtaining the funds may take a long time, on account of the complex,

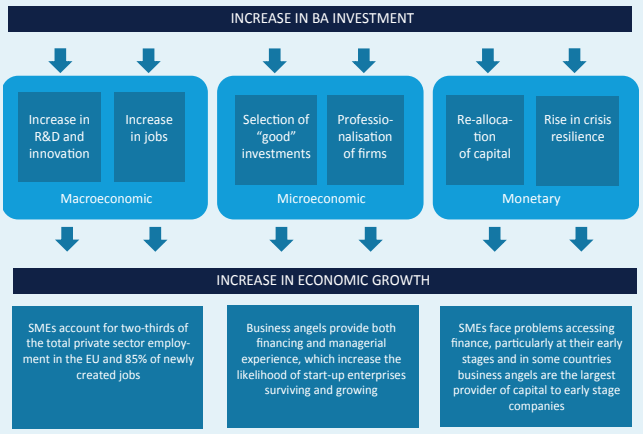
multi-stage processes. Last but not least, raising capital is frustrated by **owners' fear of losing ownership control over the company**.

One factor constraining direct investments in start-ups from the supply side is that **investors** have enough capital, but their investment decisions are **too risk-averse**. Entrepreneurs that once failed find it difficult to obtain funds necessary to launch a new business. Providing a **"second chance"** would help the economic and social integration of failed entrepreneurs and provide them with a fresh start. Surveys show that "restarting" enterprises are much more successful, viable and survive longer than the average new company, and they also grow faster and employ more workers. According to investors' experience, SME business plans are often not credible, there are only a **few good business ideas** that are worthy of venture capital investments. **New businesses are weaker** than necessary in their financial, digital, foreign language and sales **competencies**; therefore, they entail higher risk, which limits their ability to obtain funds or completely prevents them from doing so.

4.5.2 THE SIGNIFICANCE OF BUSINESS ANGELS

Angel investors are individuals, rather than institutional investors or venture capital companies, who make venture capital-based investments in new companies with high growth potential, usually in start-ups. **Business angels** typically make decisions on their investments on a subjective basis. **Besides the capital investment, they also provide intellectual capital, such as financial and management expertise, and strategy to contribute to the development of the firm**, from the beginning of the investment to its end. Business angels usually make medium- or long-term investments in start-ups. Angel investors' funds foster economic growth and competitiveness through various channels (Chart 4-21).

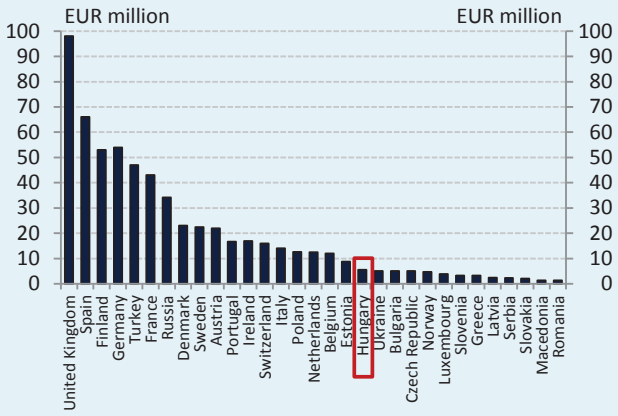
Chart 4-21: The significance of business angels



Source: European Investment Fund.

Providing funds to early-stage companies is extremely important, and **angel investors** play a key role in this, although **their investments are still relatively small**. Approximately 10 percent of the angel investments appear in official statistics. **Based on the currently available data, angel investments should be roughly quadrupled (Chart 4-22).**

Chart 4-22: Visible angel investments in 2017



Source: European Investment Fund.

4.5.3 FURTHER EDUCATION OF INVESTORS

Making capital investments in start-ups and young firms involves high risks. When they launch, start-ups usually have one idea that is in many cases not marketable in its planned form, and, as such, it is difficult for investors to evaluate. **If investors find a marketable idea and finance a start-up through capital investment, they run quite a high risk and it may easily lead to all their invested money being lost.** The risk of the investment is heigh-

tened by the fact that firms do not always have meaningful economic results, a realistic business plan, someone who can credibly implement the idea, and there is a huge disparity between how the entrepreneur and the investor assess the value of the company. **The education of investors would help them assess the risks inherent in a given business idea or company more accurately**, differentiate between new companies in this regard, and mitigate their investment risk by stipulating certain conditions. This would greatly enhance the protection and confidence of investors, which could increase their willingness to invest, and thus over the longer term it would also not let a few negative experiences prevent other promising business ideas from being realised.

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5 Human capital

One of the most important factors influencing economic growth, convergence and competitiveness is human capital, which affects the performance of the national economy through both its quantity and quality. Over the long term, the available workforce is fundamentally determined by demographic developments, while the productivity of human capital is affected by the qualifications, health condition and attitude to work of the employed. In the case of human capital, at present major reserves can be identified in terms of both quantity and quality, which may contribute to successful convergence by raising corporate capacities and productivity.

Similarly to underlying demographic trends in Europe, developments in Hungary are also characterised by a steady decline in and the ageing of the population. Without intervention, these developments may increasingly restrain labour supply through the decline in the working-age population, exerting an unfavourable effect on economic growth and the state budget. By 2030, the number of working-age people may decline by nearly 600,000 in Hungary. A favourable demographic turnaround can be achieved by raising the fertility rate, but this only has an effect over a horizon of several decades. The post-2010 economic policy aimed at improving demographic developments by supporting childbearing, which contributed to the fact that the total fertility rate in Hungary rose from its historical low of 1.23 in 2011 to 1.53 by 2016. However, in spite of the rising fertility rate, the necessary demographic turnaround has not yet taken place in Hungary, as the figure of 2.1 needed for social reproduction has still not been reached. If the reform path assuming a further gradual increase in the fertility rate materialises, the population decline observed in the past decades may already stop by 2030, and over the longer run favourable demographic developments may contribute significantly to economic growth, when the generations with a higher number of people born by then enter the working age. In the reform scenario, in 2030 the total number of inhabitants and the number of working-age people may be 325,000 and 150,000 higher, respectively, compared to the scenario of the middle-income trap (where the total population and number of working-age people may decline by roughly 375,000 and 583,000, respectively, between 2018 and 2030).

In the past years, the expansion of employment was one of the main driving factors behind economic growth, with a major contribution from the reform measures to stimulate labour market activity after 2010. Looking ahead, one key to successful convergence with Austria is to achieve and sustain full employment, for which an increase in employment is essential, even while the population is declining. Based on our forecast for the reform path, there will be a major rise of 6 percentage points in the employment rate between 2017 and 2030, and thus the number of employed will increase even in parallel with the decline in the active-age population. The unemployment rate will be stable at around 4 percent. Within the general rise in the number of employed, the number of employed in the private sector is expected to increase by 250,000 by 2030. The return of the inactive and those living abroad may increase total employment by 175,000 people by 2030. In addition, we assume that a significant amount of workforce will return to the private sector from public administration and public work schemes.

The health status of the population has a significant effect on the quantity and quality of the labour force available in the economy, and in addition to the labour market it can contribute to economic growth by numerous other channels as well. The impact of health status on economic development has been corroborated by empirical analyses. The dissatisfactory health condition of the Hungarian population contains major efficiency, productivity and growth reserves. The greatest contribution to the sustainability of the health care system and to increasing the healthy life years would be if the population's health awareness rose in the future, and if there was much more emphasis on prevention in the health system than at present. In Hungary, many people suffer from illnesses that could be avoided with a healthier lifestyle (e.g. high blood pressure and diabetes). One of the main problems of the Hungarian health care system is that private expenditures on health are not spent in institutionalised forms, i.e. through health funds or private health insurance. It would be expedient to reduce the ratio of households' direct (out-of-pocket) health care expenditures to below the average of the countries in the region.

A well-trained workforce, i.e. human capital of adequate quality, is indispensable to increase the productivity of the economy and thus to implement sustainable convergence. The earnings level and employment rate of employees with higher levels of education exceed the corresponding data of those with a lower level of education. Consequently, it is expedient to increase the share of tertiary graduates, especially in the field of sciences. The main challenge for the education system is to prepare the youth for a future status of the labour market that is increasingly difficult to predict because of the accelerating

development. It would also be progressive if the attitude that it is possible to meet the challenges of the modern era only with the help of continuous (self-)development would spread in Hungarian society. In the future, in addition to providing basic encyclopaedic knowledge, the education system should primarily focus on the acquisition of adequate basic skills (including the English language and IT skills), and students should be vested with the need and ability to engage in continuous learning. At the whole economy level, expenditures on (public) education are basically recovered only over the long term; the achievement of short-term results requires further strengthening of the adult education and the system of corporate training.

KEY INDICATOR	LATEST VALUE	TARGET VALUE FOR 2030	SOURCE
Total fertility rate should reach the minimum level needed for social reproduction	1.5 (2016)	2.1	Eurostat
Crèche should be available for all Hungarian children between 2 and 3 years of age	40,000 (2016)	around 100,000	HCSO
Number of employees should increase in the private sector	3,350,000 (2017)	3,600,000	HCSO
Return of some of the Hungarians working abroad	At least 100,000		HCSO, United Nations
Ratio of households' out-of-pocket expenditures within total health care expenditures should decline to below the average level of the Visegrád countries	29% (2015)	19%	Eurostat
Healthy life expectancy should be the highest among the V4 countries	60 years (2016)	64 years	Eurostat
PISA scores should exceed the EU average in every subject	475 points (2015)	489 points	OECD
Rate of early school leavers should be lower than the V3 average	12.5% (2017)	7%	Eurostat
Share of tertiary graduates should exceed the EU average in the 25–34 age group	30% (2017)	39%	Eurostat
Share of science tertiary graduates should exceed the V3 average in the 20–29 age group	13 / 1000 inhabitants (2016)	18 / 1000 inhabitants	Eurostat
Ratio of participants in lifelong learning should reach the EU average	6% (2017)	11%	Eurostat

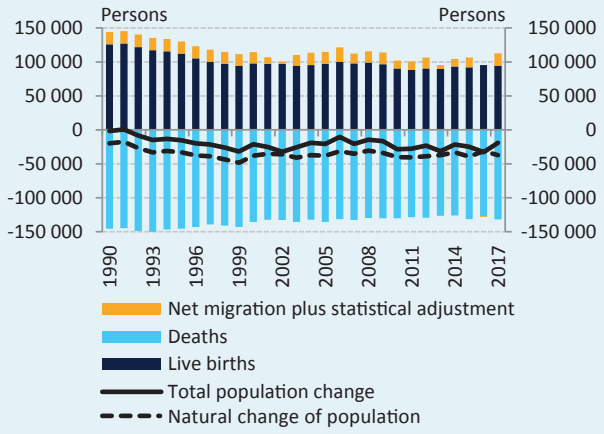
5.1 Demographic developments

5.1.1 CHANGES IN DEMOGRAPHIC DEVELOPMENTS

Demographic developments in Hungary are characterised by an ageing society and a declining population. According to available population forecasts, similarly to international trends, these unfavourable demographic trends may continue in Hungary in the coming decades.[52]

A decline in Hungary's population has been observed since the early 1980s. Although the annual mortality rate decreased as a result of the gradual rise in life expectancy, the birth rate fell to an even greater degree over the past two decades (Chart 5-1). While 125,000 children were born in 1990, the annual average number of births was 91,000 between 2010 and 2017. Considering that the number of births is unable to offset the population decline attributable to mortality, in recent years Hungary's population decreased by an annual average of 38,000 people as a result of the natural population decline.

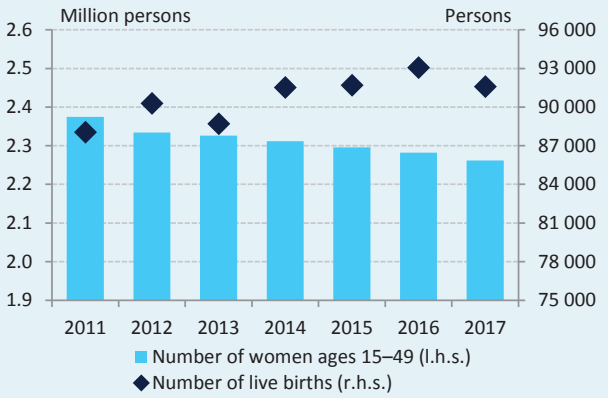
Chart 5-1: Decomposition of changes in the Hungarian population, 1990–2017



Source: Eurostat.

The declining trend of live births came to a halt in recent years, and on the whole, the number of live births increased after 2011. The 88,000 births in 2011 was a historical low in Hungary. In 2017, 91,577 children were born in Hungary, exceeding the value for 2011 by 3,500 children, i.e. by 4 percent.[53] Changes in the number of births are determined by the number and fertility of childbearing-age women. Between 2011 and 2017, the number of births increased despite the fact that the number of women aged 15–49 declined by more than 5 percent, i.e. by 112,000 in total (Chart 5-2). This means that **fewer and fewer potential mothers are having more children, i.e. the fertility rate is rising.**

Chart 5-2: Number of childbearing-age women and number of live births in Hungary, 2011–2017

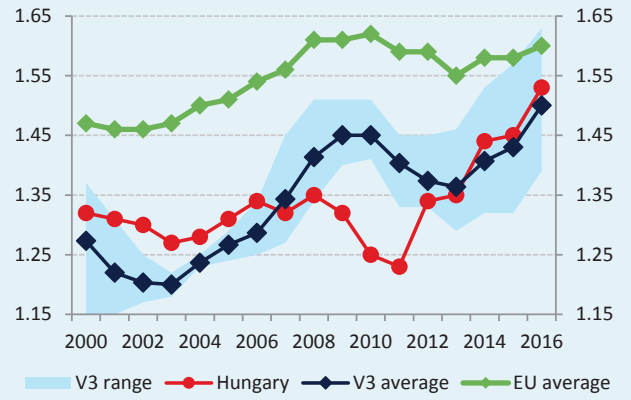


Note: The number of live births shows the number of children born in Hungary.
Source: HCSO.

The total fertility rate[54] started to increase in recent years, rising from 1.23 in 2011 to 1.53[55] by 2016, which is the highest value since 1996. The total fertility rate is a hypothetical indicator that shows the completed fertility of a generation. Based on the 2016 fertility rate, one hundred women would give birth to 153 children during their lives at this level of fertility. In recent years, Hungary has caught up with the fertility rate of the Visegrád countries, but the figure for Hungary is still below the average value of 1.6 for the countries of the European Union (Chart 5-3). At present, none of the EU countries reach the level of 2.1 needed for social reproduction.

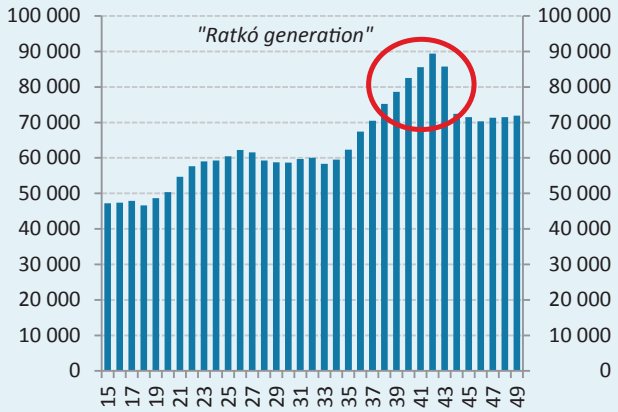
[52] For example, HCSO Hungarian Demographic Research Institute (DRI) (2015), European Commission (2018)
[53] The statistics concerning live births are different in the databases of the HCSO and Eurostat. The HCSO data are for the live births in Hungary, while those of Eurostat contain the live births from mothers living in Hungary, according to the 'usual residence' definition used since 2013 (HCSO, 2018a).
[54] The total fertility rate 'is the average number of those children born alive that could be given birth to by a woman during her life if her fertile years elapsed in conformity with the age specific fertility rates of the given year' (HCSO, 2018b).
[55] Based on Eurostat data.

Chart 5-3: Total fertility rate in the Visegrád countries and the European Union, 2000–2016



Note: The V3 values show the data for the Czech Republic, Poland and Slovakia.
Source: Eurostat.

Chart 5-4: Number of childbearing-age (15–49-year-old) women by age years



Source: HCSO

Despite the improving fertility rate, the necessary demographic turnaround has not yet taken place in Hungary. Simple reproduction of the population requires achieving and sustaining a fertility rate of 2.1, which ensures that the number of female children equals the headcount of the generation of mothers (HCSO DRI, 2018).[56] However, the fertility rate of 2.1 is only able to stabilise the population over a period of several decades, when all the childbearing-age women go through the childbearing age at the higher fertility level.

In the coming period, the decline in the number of childbearing-age women will become an increasingly effective constraint to increase the number of live births. This is because the majority of the large generations born between 1974 and 1979 (the so-called Ratkó grandchildren) have already reached the age of 40, and will soon leave childbearing age (Chart 5-4). Therefore, the number of births may decline in the coming years, even if the fertility rate rises. The number of 49-year-old women leaving the group of childbearing-age women is around 70,000 in 2018, and may even be between 80,000–90,000 in certain years in the coming period. At the same time, the number of 15-year-olds who enter the group is 47,000 only.

5.1.2 DEMOGRAPHIC DEVELOPMENTS USING DIFFERENT ASSUMPTIONS

A demographic turnaround mainly requires a further increase in the total fertility rate. If the reform path materialises, the fertility rate may gradually rise from the current value of around 1.5 to 2.1 by 2030 based on the demographic targets of the 180-point proposal drafted by the Magyar Nemzeti Bank.[57] In the following, we present how the Hungarian population and its age composition may change if the reforms are implemented and in the middle-income trap.

Changes in population are jointly determined by three factors: the fertility rate, life expectancy and the balance of net migration. Over the short run, developments in the reform path and the scenario of the middle-income trap will evolve based on the same assumptions until 2020, as according to our assumption the effects of demographic measures will appear only after this 2-year period.

- In the case of the *fertility rate* the increase observed in the past years is assumed to continue until 2020, until reaching the value of 1.68. In the scenario of the middle-income trap, the rise in the fertility rate is expected to come to a halt and remain at an unchanged level between 2021 and 2030, while in the reform scenario the total fertility rate gradually approaches and in 2030 reaches the value of 2.1 needed for reproduction.

[56] This value slightly exceeds two children per one woman, as the frequency of births of male children among live births is higher, and on the basis of mortality rates not all infants eventually reach childbearing age.
[57] Magyar Nemzeti Bank (2018): 180 steps for the sustainable convergence of the Hungarian economy. Working paper, July 2018.

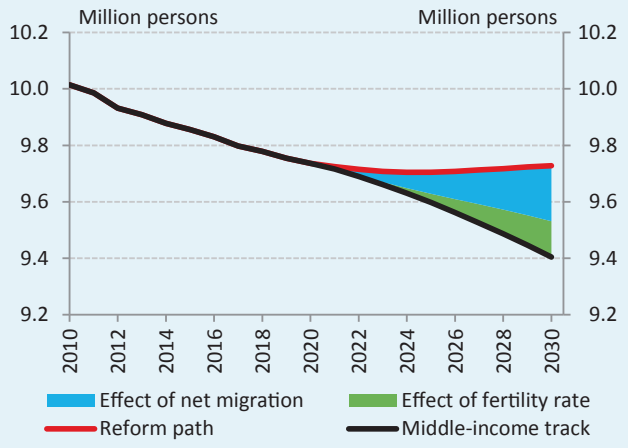
- In the case of *life expectancy*, in the scenario of the middle-income trap we assume that the values assumed in the European Commission's 2018 population projections will be reached. Accordingly, by 2030, women's average life expectancy at birth may increase from 79 years in 2017 to 82.3 years, while that of men may rise from 72.4 years in 2017 to 76 years. **On the reform path, we assume that the life expectancy of the Hungarian population will reach the level of the Czech Republic, which has the highest indicator among the Visegrád countries.** This means that – compared to the value assumed in the baseline scenario – life expectancy may increase by almost an additional 2 years in the case of both women and men by 2030.

- The *balance of net migration* **may considerably contribute to the increase in the population increase via the return of Hungarians working abroad.** Returning Hungarians who work abroad and their family members may increase the number of people aged 15–74 by some 170,000 between 2018 and 2030, although of this group we expect 100,000 people to appear in the labour market as employees by 2030. **Compared to that, in the scenario of the middle-income trap the labour force that leaves the country due to the lack of wage convergence reduces the population number.** The difference between the two scenarios amounts to an annual average of 18,000 people between 2021 and 2030, exerting a significant effect on the changes in Hungary's population.

The decline in population observed in the past decades may come to an end if reforms are implemented. Hungary's population amounted to 9.78 million people in January 2018. On the reform path, the population may decline at a decreasing pace until 2025. Then, starting from 2026, a moderate increase is expected, and thus the Hungarian population may amount to 9.72 million people in 2030. In the scenario of the middle-income trap, the decline in the population may continue, reducing the figure by almost 400,000 to 9.4 million people between 2018 and 2030. With the assumptions of reform path, in the short run primarily the return of those Hungarians who currently work abroad is able to stabilise the population, as the rise in the fertility rate can only increase the population over a longer period (Chart 5-5).

The number of young people may increase considerably in the reform scenario by 2030. On the reform path, the number of children aged 0–14 may increase by 151,000 between 2018 and 2030 due to the rise in the fertility rate. On the reform path, the share of those aged 0–14 within the population may increase from 14.5 percent in 2018 to 16.2 percent in 2030. The additional number of young people, which is attributable to the higher fertility rate, does not add to the number of working-age people until 2030, but it does so over a horizon of several decades.

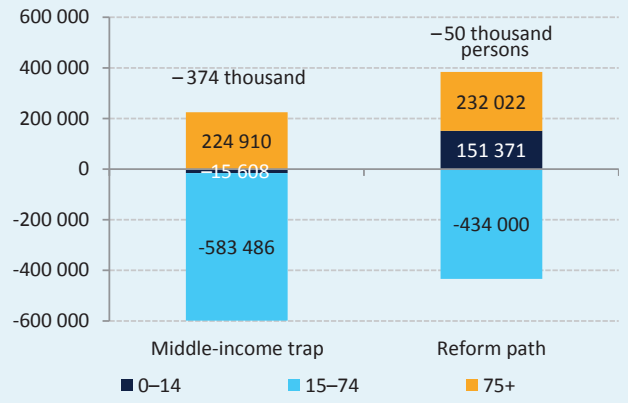
Chart 5-5: Estimated changes in the Hungarian population until 2030



Source: Eurostat, MNB calculation.

Population ageing may continue along both paths over the medium term. In the scenario of the middle-income trap, the number of those older than 75 years may grow by 225,000 between 2018 and 2030. A slightly larger increase of 232,000 people is expected on the reform path as a result of higher life expectancy. Within the population, the share of old-age people may increase from 8 percent in 2018 to 10.8 percent in 2030 in the scenario of the middle-income trap and may amount to 10.5 percent in 2030 on the reform path.

Chart 5-6: Estimated change in the Hungarian population between 2018 and 2030

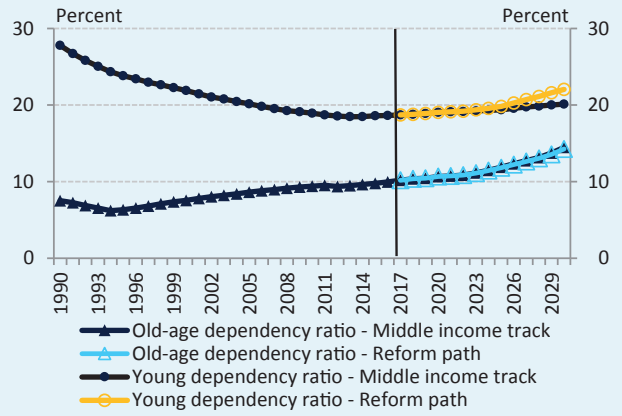


Source: MNB calculation.

Developments in the old-age dependency ratio may nearly be identical along the two paths until 2030, while young-age

dependency ratio may be 2 percentage points higher in the case of the reform path. The old-age dependency ratio is the ratio of 75-year-old and older people to the working-age population (15–74 years).[58] The old-age dependency ratio may increase from 10 percent in 2018 to 14.5 percent in 2030 in the middle-income trap scenario, and may amount to 14.3 percent in 2030 in the reform scenario (Chart 5-7). This means that while in 2018 there are 10 elderly people per 100 working-age individuals, there will already be approximately 15 in 2030.

Chart 5-7: Changes in dependency ratios between 1990 and 2030

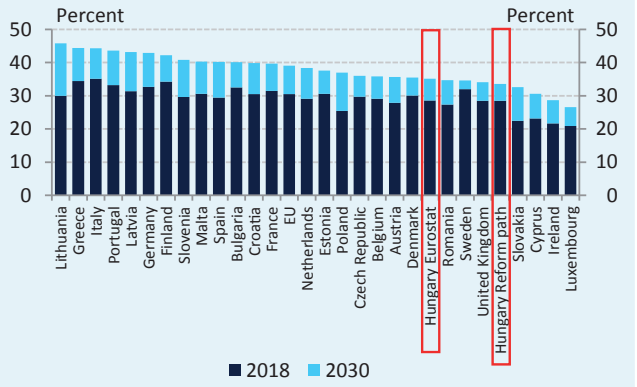


Note: In the case of the above indicators, 15–74-year-old people are considered working-age population. The chart shows actual data between 1990 and 2017, and contains our estimates for the period between 2018 and 2030.
Sources: Eurostat, MNB calculation.

The young-age dependency ratio may rise from 18.8 percent in 2018 to 20 percent in the middle-income trap scenario, and it may be 22 percent on the reform path if the fertility rate increases as assumed. A higher fertility rate gradually results in a higher number of live births, thus increasing the share of young generations within the population. Education and health care systems should be prepared for the additional number of people appearing therein due to the higher number of live births, which may require capacity expansion as well as an increase in the workforce available in these sectors. On the whole, until 2030, a major rise in the total dependency ratio is expected in the reform scenario, and this rise will be the joint result of the higher number of young people due to the higher fertility rate as well as of the larger number of people in the older generations due to the higher life expectancy.

In its population projections, the European Commission (2018) considers those aged between 15 and 64 years as working-age population. In Hungary, if the reform path materialises, the ratio of the population aged 65 and older to those aged between 15 and 64 years (*old-age dependency ratio*) may rise from 28.5 percent in 2017 to 33.6 percent by 2030, which is more favourable than the around 40 percent average value calculated by the European Commission for the EU countries, and is also lower than the 36 percent ratio estimated for Austria (Chart 5-8). If the reform path materialises, the old-age dependency ratio will increase to a lesser extent compared to the middle-income trap scenario, as a significant proportion of the Hungarian citizens returning from abroad may be working-age people. Nevertheless, the reversal of current demographic developments (rising fertility rate) may restrain the increase in the old-age dependency ratio only over a period of several decades, as the children born in the near future will only appear on the labour market after several decades.

Chart 5-8: Old-age dependency ratio in the countries of the European Union in 2017 and 2030 (share of the population older than 65 years to those aged 15–64)



Note: The above indicator considers the population aged 15–64 years as working-age population.
Sources: EC (2018), Eurostat, MNB calculation.

5.1.3 MACROECONOMIC EFFECTS OF DEMOGRAPHIC DEVELOPMENTS

Demographic trends affect macroeconomic developments through various channels. The share of working-age population has a direct impact on the size of labour supply, but may also indirectly affect the level of investment.

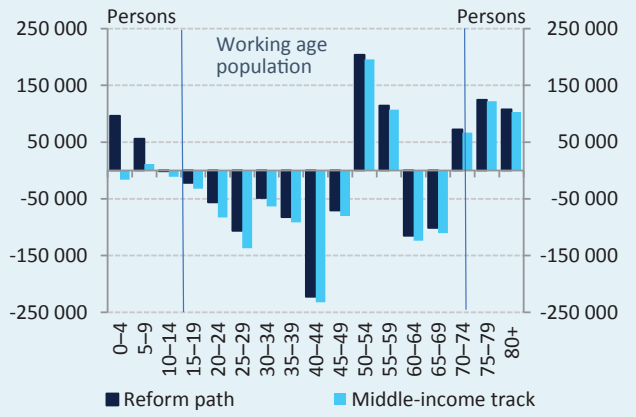
Looking ahead, demographic developments may constitute an increasingly strong labour supply constraint. The working-age population is expected to decline in both scenarios (Chart 5-6). In the middle-income trap scenario, the number of those aged 15–74 may decrease from 7.57 million

[58] In the case of a different definition of the working-age population (aged 15–64), the old-age dependency ratio can also be examined as the ratio of the 65-year-old and older people to the population aged 15–64.

in 2018 by a total 583,000 between 2018 and 2030. **On the reform path, the number of working-age people may decline to a lesser extent, by a total 434,000 by 2030.** The smaller decline in the number of working-age people compared to the scenario of the middle-income trap is attributable to the high number of workers returning to Hungary.

Numerical changes in the individual age groups of the working-age population until 2030 will be primarily determined by past demographic trends. The significant drop in the number of people aged 40–44 and the increase in the number of people aged 50–54 will be caused by the Ratkó grandchildren entering these age groups between 2018 and 2030. The decline in the number of potential employees in their sixties is a result of the ageing of the Ratkó children, which contributes significantly to the decrease in the total number of working-age people over the projection horizon (Chart 5-9).

Chart 5-9: Changes in the age groups of the Hungarian population between 2018 and 2030



Source: MNB calculation.

Within the population, the share of those aged 15–74 years may decline from 77.4 percent in 2018 to 73.4 percent by 2030 if the reform path materialises, while in the middle-income trap scenario their proportion may be slightly higher, at 74.3 percent. The underlying reason is that in the latter case the working-age population declines to a greater extent between 2018 and 2030 than the population as a whole, mainly due to the increase in the older population. In the reform scenario, however, the decline in the number of working-age people will result in a gradual decrease in their share within the population, as the latter will practically stagnate between 2018 and 2030, in parallel with a rise in the number of children and elderly.

The composition of society by age groups can also affect the levels of key macroeconomic variables and ultimately the gross domestic product as well. However, as demographic developments – by their very nature – only exert their effects slowly over a horizon of several decades, they may influence the changes in macroeconomic variables only to a small extent over the time frame under review, which extends to 2030. Over the short run, achieving a demographic turnaround may have an unfavourable effect primarily on the labour market. The underlying reason for this is that there is a significant difference between the reform path and the scenario without reforms in terms of our assumptions for the total fertility rate, due to which the annual average number of live births is some 14,000 higher in the reform scenario. **As a result, the labour supply of mothers who are raising small children may temporarily decline, the effect of which may be reduced by the capacity increases in crèches assumed in the reform path.** Based on the demographic target included in the 180 points, a **crèche may be available for all infants aged between 2 and 3 years by 2030**, and thus mothers with small children will have the opportunity to return to the labour market earlier.

In past decades – in parallel with a gradual deterioration in the demographic prospects of the developed world – **many empirical studies attempting to quantify the impact of demographic developments on macro variables were published**. One of the most comprehensive estimates of this type was prepared by Aksoy et al. (2018). For the estimate they took into account the – demographic and macroeconomic – data of 21 OECD member states between 1970 and 2014, and quantified the effect of the proportion within the society of three age groups (0–19, 20–59 and 60+) for six macroeconomic variables (real GDP growth, investment rate, savings rate, number of hours worked, short-term real interest rate, inflation). In the estimation, the authors also took into consideration the interactions between the macroeconomic variables.

According to their findings, **over the long run, the share of children (0–19 years old) and working-age people (20–59 years of age) within the population has a positive impact on the rate of economic growth** through the higher willingness to invest and save. In particular, a rise in the share of working-age people has a positive effect on macroeconomic variables: of course, this is primarily manifested in the number of hours worked, but the higher savings rate also has a stimulating effect on investment.

Using the results of Aksoy et al., **it is possible to estimate how much more favourable the changes in macroeconomic variables would be in the case of the demographic assumptions used in the reform path, as compared to the scenario**

without reforms. In line with our preliminary expectations, our findings show that with the demographic trends assumed in the reform path, **in 2030 the prospects for long-term real GDP growth will only be marginally higher than in the scenario without reforms**. This result is in line with the fact that demographic developments only exert their effects slowly, over a period of several decades.

Box 5-1: Demographic changes and macroeconomic effects until 2060

The effect of the favourable demographic developments that take place if the demographic turnaround is achieved will strengthen over the long term. Achievement of the fertility rate of 2.1 assumed in the reform scenario alone is unable to stabilise the population, as all childbearing-age women have to go through childbearing age at the higher fertility rate for the impact of the rise in the fertility rate to be reflected in the number of births and in the number of inhabitants as well. Over a time horizon of several decades, the generation with the higher number of children also enters childbearing age and upon reaching working age they enter the labour market. As a result, compared to the current values, in 2060 the number of those aged 0–14 may be some 330,000 higher, and the decline in the number of 15–74-year-old working-age people compared to the present level may be much smaller in the reform path than in the scenario without reforms. **If the reform path materialises, the Hungarian population may be 9.9 million people in 2060, exceeding the current figure by roughly 140,000.**

Over the long run, the ageing of the society may be more moderate if the reform path materialises. Without reforms, the old-age dependency ratio may be 27 percent in 2060, while in the reform path this indicator may amount to 23 percent in 2060, provided that those aged 15–74 are considered as working-age population. Examining the indicators compared to the 15–64-year-old population, it can be seen that without reforms the old-age dependency ratio may be 56 percent in 2060, but may amount to a much lower level of 47.5 percent in 2060 if the assumptions of the reform path materialise. The rise in the fertility rate and its remaining at the figure of 2.1 is able to decelerate the ageing of the society over a longer period of time.

Over the longer term, the economic impact of the demographic turnaround assumed in the reform scenario may be much stronger than the effects presented above. One possible explanation for this is that the children born because of the increased fertility rate become economically active later, in 20–30 years, and this is when they can also directly contribute to macroeconomic growth. This is corroborated by our calculations as well: if favourable demographic developments take place, by 2060 the long-term potential GDP growth rate will be some 0.75 percentage point higher than without a demographic turnaround. In addition, if the gradually rising growth potential was reflected in the actual growth figures as well, real GDP in 2060 could be some 11.9 percent higher than if a demographic turnaround failed to take place.

Nevertheless, as with all long-range estimates, the above calculations also involve significant uncertainty. This is so because these calculations are only valid if – in terms of the functioning of the macroeconomy – Hungary does not deviate significantly from the countries examined in the estimate of the above study, and if in the coming decades the pattern of macroeconomic developments remains similar to that of the 1970–2014 period used for the estimate. Due to the fact that the estimates are for several decades, the validity of the latter assumption in particular can be questioned. Therefore, the values we have calculated can only be considered approximate.

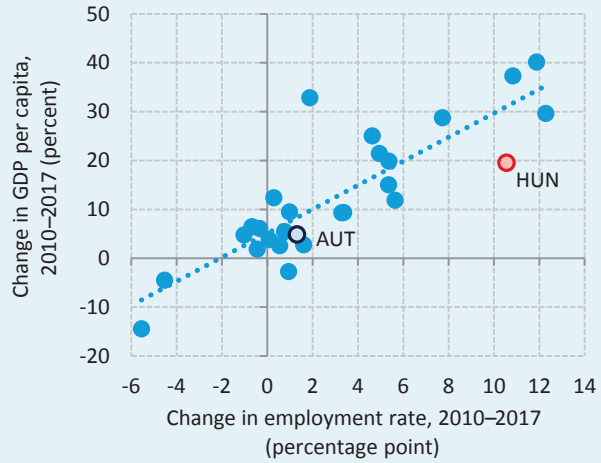
5.2 Labour market

5.2.1 INTRODUCTION

In addition to physical capital and total factor productivity, **human capital is one of the most important determinants of economic growth, convergence and competitiveness**. With its quantitative and qualitative characteristics, human capital affects economic growth via two channels. Firstly, via the size of the workforce available in whole-economy production and measured with the activity, employment and unemployment rates. Secondly, human capital affects growth via the productivity of employees, determined by the level of education and health status.

The contribution of the accumulation of human capital to economic growth is positive. Examining the European Union between 2010 and 2017, a positive correlation is seen between the rise in the employment rate and the change in GDP per capita (Chart 5-10). In Hungary, the employment rate – in the 15–74 age group – increased by more than 10 percentage points, and in parallel with that, the GDP per capita expanded by nearly 20 percent in the period under review.

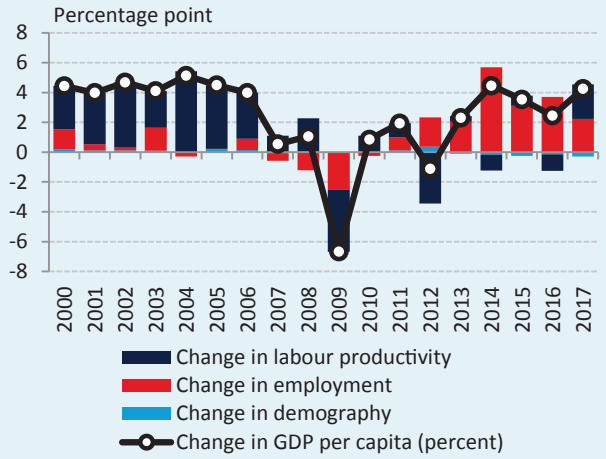
Chart 5-10: Changes in employment rate and GDP per capita in the countries of the European Union between 2010 and 2017



Sources: Eurostat, WDI.

In past years, the expansion in employment contributed the most to the increase in GDP per capita in Hungary (Chart 5-11). Since 2010, as a result of tax reforms and expenditure-side fiscal reform measures aimed to expand employment, the rise in the employment rate has contributed to the increase in GDP per capita by almost 20 percentage points, while the contribution of the changes in demography and labour productivity has been slightly negative. The former clearly illustrates that demographic developments (declining and ageing population) represent an increasingly effective constraint to employment expansion and economic growth. On the other hand, the low contribution of the latter to growth is attributable to the composition effect of the dynamic expansion in employment after 2010.

Chart 5-11: Labour market decomposition of the annual change in Hungarian GDP per capita



Source: Eurostat.

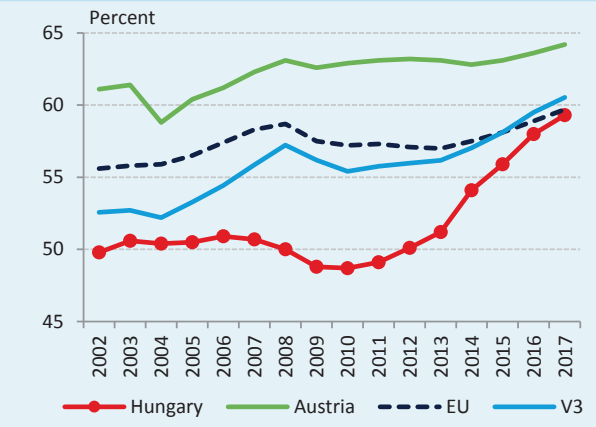
5.2.2 . DEVELOPMENTS IN THE HUNGARIAN LABOUR MARKET IN RECENT DECADES

The political transformation and the subsequent period had a significant impact on the developments observed in the domestic labour market in recent decades. As a result of the transformation crisis of the 1990s, the Hungarian labour market was at a competitive disadvantage, which could not be completely overcome even to this day. Approximately 1.3 million jobs disappeared between 1990 and 1995. Economic policy attempted to moderate mass unemployment by facilitating retirement into inactivity, as a result of which the economically active population declined by nearly 700,000 between 1990 and 1995 (Palotai–Virág, 2016).

In the last third of the 1990s, employment expanded, but this trend came to a halt in the first half of the 2000s. Employment expansion in the late 1990s was supported by favourable demographic developments (Ratkó grandchildren entering the labour market) as well as a general improvement in economic activity, as a result of which Hungary came close to the Visegrád region. However, the rise in employment came to a halt in the early 2000s, while the activity rate – in spite of the favourable economic conditions – was still well below the average of the EU and Hungary's competitors in the region: Hungary's activity and employment rates were among the lowest in the EU ranking (Chart 5-12). The low employment was partly attributable to the high level of taxes on labour, the disproportionately generous transfer system and the rising

labour cost, which pushed companies towards more capital intensive production (Kátay–Wolf, 2008).

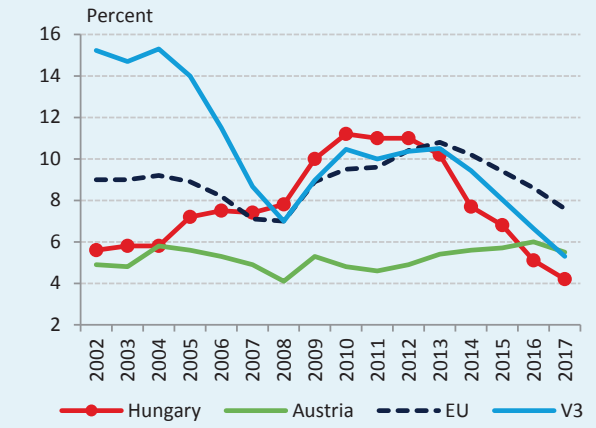
Chart 5-12: Employment rate in the 15–74 age group in a European Union comparison



Source: Eurostat.

The global crisis that erupted in 2008 further exacerbated the situation on the labour market. As a result of the crisis, in parallel with falling demand, companies' labour demand also decreased considerably, leading to a sharp drop in the number of employed. The employment rate declined to its low in 2010 and was the lowest in the European Union in 2008–2010. In parallel with this, the unemployment rate reached its historical high in 2010, exceeding the averages of the EU and of Hungary's competitors in the region (Chart 5-13).

Chart 5-13: Unemployment rate in the 15–74 age group in a European Union comparison

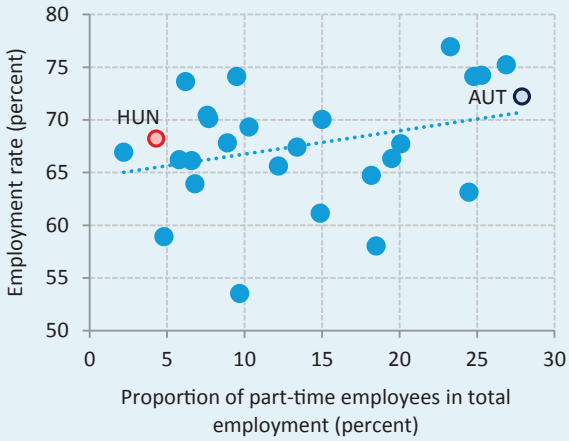


Source: Eurostat.

Starting from 2010, thanks to the measures intended to help the labour market recover from the crisis, employment started to expand, and economic growth also returned in parallel with that. Increasing the number of employed and reducing unemployment became priorities after 2010, supported by various government measures. The main relevant means were the reduction of taxes on labour and the shift towards taxes on consumption (Matolcsy–Palotai, 2018). The rise in labour demand was supported by the introduction of the flat rate personal income tax, the reduction of the tax wedge, the introduction of the Job Protection Action Plan and the expansion of public work programmes. In addition to the rationalisation of welfare transfers – for example abolishing the possibilities of early retirement and tightening the conditions for becoming eligible for disability pension, and reducing the period and amount of unemployment benefits – and gradual increasing the retirement age, the introduction and continuous expansion of the family tax base allowance also supported the supply side of the labour market.

Between 2010 and 2017, the number of employed people increased by nearly 700,000, significantly contributing to the economic growth observed in recent years. In terms of labour market indicators, Hungary's ranking improved considerably in the European Union. The employment rate in Hungary rose by more than 10 percentage points between 2010 and 2017, and at present it is around the average of the region, although it is still below that of Austria. One of the reasons for the lower domestic employment rate is that atypical forms of employment are less widespread (Chart 5-14). At the same time, the unemployment rate in Hungary is more favourable than in Austria, while Hungary's activity rate still falls short of that of Austria and the EU average.

Chart 5-14: Ratio of part-time employees and the employment rate in the European Union in 2017



Source: Eurostat.

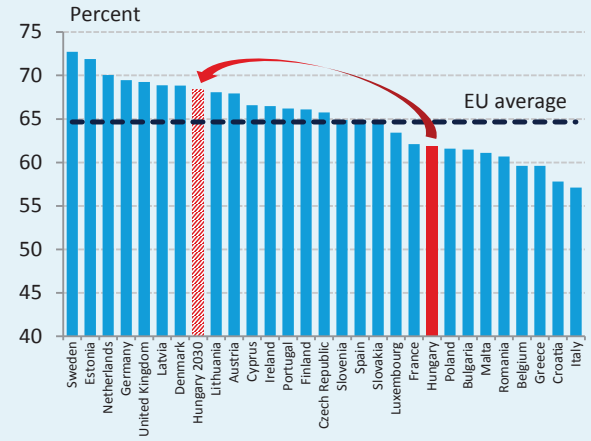
5.2.3 DEVELOPMENTS IN THE LABOUR MARKET UNTIL 2030

Further improvement of the quantitative conditions on the domestic labour market is indispensable for the Hungarian economy to converge with Austria. Looking ahead, achieving and sustaining full employment is crucial to successful convergence. However, in addition to increasing the quantity of labour available in the national economy, the structural challenges must also be addressed.

According to our forecast for the reform path, there will be a major, 6 percentage point rise in the employment rate between 2017 and 2030. In parallel with this, the activity rate in Hungary will also rise significantly, increasing from the present 62 percent to 68 percent and thus advancing to the upper third of the current EU ranking (Chart 5-15). At the same time, the unemployment rate will be stable around 4 percent, maintaining the state of full employment.

On the path of middle income trap, however, both demographic and labour market developments would be less favourable, and would become constraints for production capacities. In this scenario, the employment rate is stagnant, while following an initial decline the unemployment rate rises to above 6 percent, as a result of which the activity rate increases to a lesser extent compared to the reform path. Accordingly, for 2030 there are significant differences between the labour market data of the reform path and the middle income trap scenario.

Chart 5-15: Activity rate of the population in the 15–74 age group in the countries of the European Union in 2017 and in the reform scenario in Hungary in 2030

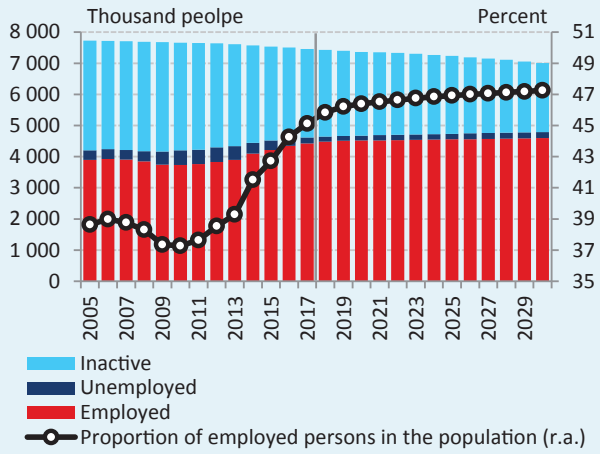


Sources: Eurostat, MNB.

One of the main challenges for the Hungarian economy is to maintain the number of employed at a high level while the society is ageing. Looking ahead, the demographic constraints on the labour market are rising: according to Eurostat's forecast – without further measures – the number of working-age people in Hungary will decline by nearly half a million by 2030, and by 1.4 million by 2060. Over the short run, the number of working-age inhabitants cannot be influenced through demographic developments, because the increase in the fertility rate can only add to the number of working-age population over a period of decades (apart from those returning from working abroad). In order to sustain the number of employed people necessary for convergence, the employment rate must be raised within the active-age group, and thus an increase in the number of employed can also be achieved.

Economic convergence is possible if full employment is maintained even if the number of working-age population is declining (Chart 5-16). On the reform path, the number of employed may increase by 175,000 people between 2017 and 2030, and thus their ratio within the whole population rises steadily by 2 percentage points. In addition, the number of unemployed may be stable at a low level, while the number of inactive may decline until 2030. Growth in the number of employed is an important objective for ensuring permanent convergence as well as for ensuring an adequate standard of living for the increasing number of the elderly.

Chart 5-16: Changes in the population in the 15–74 age group according to economic activity on the reform path until 2030



Sources: HCSO, MNB.

On the reform path, within the general rise in the number of employed, the number of people employed in the private sector is expected to increase significantly. From 2017 to 2030 the headcount in the sector will increase from 3,350,000 to 3,600,000 people, and thus **the number of people working in the private sector will increase by 250,000.** The expansion in employment in the private sector in the reform scenario is partly attributable to additional change in headcount and partly to structural changes. **In terms of the change in headcount, we expect 175,000 people to enter into employment**, including the re-entry of 75,000 inactive and 100,000 Hungarians returning from abroad. **In addition, we assume that as part of the structural change 75,000 people will transfer from the public sector to the private sector**, including 15,000 people from public administration and 60,000 from public work programmes.

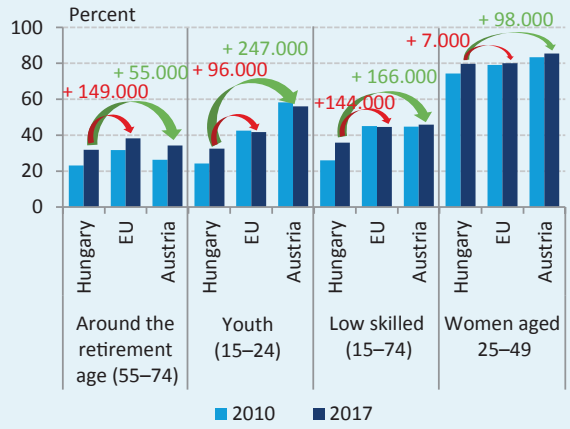
The most significant possible source of employment expansion in the private sector is the group of those who are inactive at present. In 2017, the number of inactive people among those aged 15–74 was 2.8 million, and 1.1

million among those aged 25–64, who are considered the most active. Although a major decline was observed in the number of the inactive due to employment-expanding measures in past years, this group still contains significant labour reserves. In analysing the number of the inactive, it is also expedient to examine the groups that are generally considered more vulnerable in the labour market and are the least employed.

Of the more vulnerable groups, significant labour reserves can be identified primarily in the case of those around retirement age as well as among the young people and those with low education. In spite of the rise observed in recent years, the activity rate of these groups falls short of the indicators in Austria and the European Union (Chart 5-17).

Comparing the activity levels of these groups to Austria, the largest difference is seen in the activity of young people. In the case of the young, the involvement of 250,000 people would be necessary to reach the indicator of Austria. The corresponding figures for those around retirement age and low skilled persons are 55,000 and almost 170,000 people, respectively. Compared to Austria, 100,000 active women aged 25–49 years are missing, although Hungary has caught up with the EU average. Compared to the EU averages, the greatest shortfall is seen for those around retirement age and the low skilled. Looking ahead, the gradual rise in the retirement age to 65 years by 2022 contributes to the increase in the activity of those around retirement age. As a result, 300,000 people will not retire in 2022, increasing the number of employed by around 100,000 people.

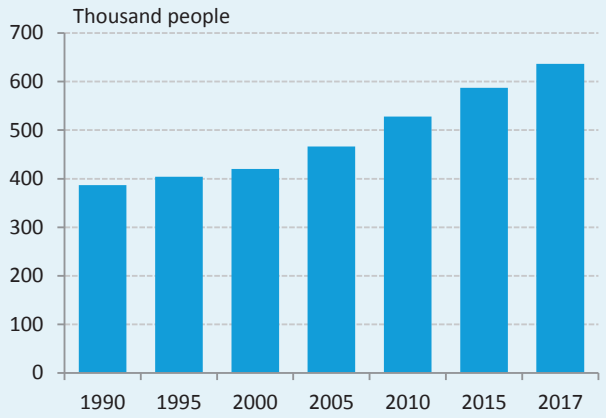
Chart 5-17: Changes in the activity rate in certain social groups



Note: The red and green numbers indicate the additional activity needed to reach the rates of the EU and Austria, respectively, in 2017.
Source: Eurostat.

The number of Hungarians returning from abroad also plays a significant role in the expansion in employment. At present, hundreds of thousands of Hungarian citizens live abroad, and many of them are of working age (Chart 5-18). According to some estimates, the number of Hungarians habitually living abroad was around 260,000–350,000 (HCSO, 2018 and HCSO, 2015), while other calculations estimate the number of Hungarians living abroad at around 500,000–600,000. At the same time, in the case of the neighbouring countries the ratio of citizens living abroad is higher (UN data[59]). Most expatriates belong to younger age groups, and the ratio of graduates is much higher among them compared to the total population (HCSO, 2014). Accordingly, based on their age composition and qualifications, expatriates represent a major growth potential for the Hungarian economy. According to estimates, emigration results in lower potential growth and productivity, and also worsens competitiveness (Atoyan et. al., 2016). **Our projection assumes the return of a total 100,000 employees currently living abroad.**

Chart 5-18: Evolution of the number of Hungarians living abroad, but born in Hungary



Source: United Nations.

In our reform scenario, inflows from public administration and public work programmes also contribute to the expansion of employment in the private sector and the improvement in productivity. This structural change is a regrouping between the two sectors, which does not increase total employment, but **has a favourable impact on growth in terms of labour productivity**. This is because, according to our calculations, the labour productivity of the public sector is substantially lower than that of the private sector. Within the public sector, the productivity of administration, defence and the compulsory social insurance sector was 30 percent lower than the per employee output of the private sector in 2016. The compo-

[59] Sources of data: http://www.un.org/en/development/desa/population/migration/data/estimates2/estimates17.shtml and https://jakubmarian.com/emigration-in-europe-destination-countries-and-percentages-of-emigrants/

sition effect also played a role in this, and comparability is limited by the fact that added value is difficult to measure in public administration. According to our estimate, currently 300,000 people work in public administration in a narrow sense, while 140,000–150,000 people participate in public work programmes.

Summary

On the whole, private sector employment is expected to expand by 250,000 people on the reform path until 2030. A part of the expansion, the return of the inactive (75,000) and those living abroad (100,000) boost total employment by 175,000 people. In addition, we assume that 75,000 people will return to the private sector from public administration (15,000) and public work schemes (60,000). On the path of the middle-income trap, as a result of less favourable labour market developments, compared to the reform path the number of employed may be 410,000 lower by 2030 (Table 5-1).

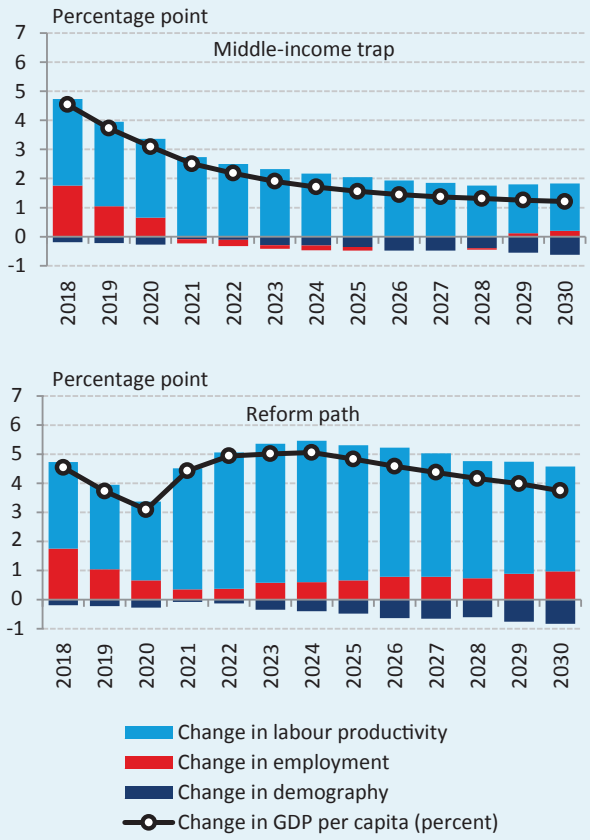
Table 5-1: Summary table of the number of those who become private sector employees from the groups that have labour reserves

Group with reserves (thousand people)	2017	Change between 2017 and 2030 on the reform path	Difference between the two paths in 2030
Inactive (15–74)	2 847	75	310
Living abroad	500–600	100	100
Difference in employment		**175**	**410**
Employed in public administration	~ 300	15	15
Public employed	165	60	60
Change in employment of private sector		**250**	**485**

Sources: United Nations, Eurostat, HCSO, MNB.

If the reforms are implemented, the change in employment will contribute considerably to the increase in GDP per capita. Until 2030, the rise in the employment rate will contribute by more than 10 percentage points to the growth in GDP per capita, whereas without reforms only it will only contribute 3 percentage points (Chart 5-19). In addition, in the reform scenario the large rise in labour productivity boosts GDP per capita to the greatest extent, with a contribution from employees returning from the public sector to the private sector. This latter rearrangement alone would raise the volume of GDP in 2017 by 0.6 percent.

Chart 5-19: Labour market decomposition of the annual change of GDP per capita in the middle-income scenario and the reform scenario

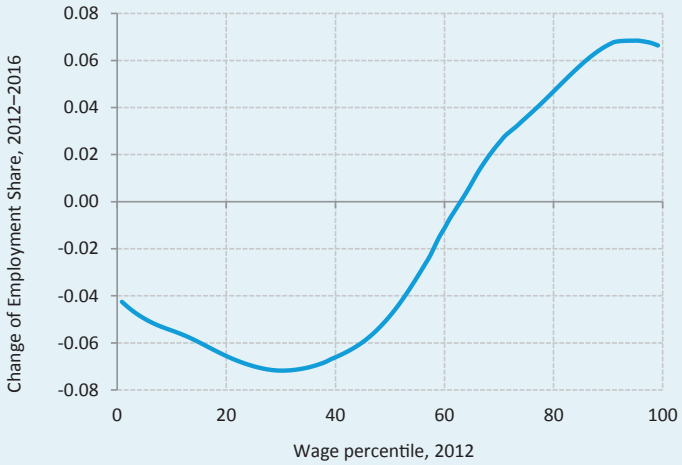


Sources: Eurostat, MNB.

Box 5-2: Polarisation of the labour market

Polarisation continued on the labour market: the ratio of jobs providing high incomes increased to the detriment of less well remunerated occupations between 2012 and 2016 (Chart 5-20). At the same time, the ratio of jobs with the lowest income increased slightly compared to ones with medium-high wages. Accordingly, employment increased the most in the 6 years under review in jobs where above-average wages were initially offered as well. Striving for higher wages is natural on the part of employees, but it seems that the structure of labour demand has also changed in line with that. (This type of comparison does not examine how the wage level changed in individual jobs. It only examines the change in number of those employed in jobs characterised by the given initial wage.)

Chart 5-20: Changes in the ratios of occupations within total employment depending on the initial wages, 2012–2016



Note: The chart shows the change in the share of occupations in total employment in Hungary between 2012 and 2016, as a function of where the average median wage of the occupation fell within the 2012 wage distribution. Occupations are defined at the level of 3-digit HSCO (Hungarian Standard Classification of Occupations) codes. Log wages are used. The chart was prepared using locally weighted regression.
Source: MNB calculation.

The jobs that provide the highest incomes are usually filled by highly qualified experts (engineers, corporate executives, lawyers). Medium wages are very often paid to skilled workers in factories and office workers, while the lowest wages are mostly paid in the services sector (cleaners, hairdressers). Highly qualified employees perform complex tasks requiring cognitive abilities, while workers with secondary education very often attend to recurring, well-defined routine tasks, such as corporate accounting or the assembly of machinery. The least qualified mostly provide services that require communication (hairdressers, beauticians) or where work has to be done in a constantly changing environment (drivers, cleaners).

The most probable explanation for the polarisation of employment is that **the new information and communication technologies (ICT) are increasingly able to substitute the workers who perform routine tasks and are in the middle of the wage distribution**. As the price of new technologies declines, it is worth replacing people with machines, and thus the ratio of these jobs is decreasing in the labour market. By contrast, corporate demand for positions requiring high qualifications is growing, because the availability of data, the expansion in computing capacity and cheap means of communication increase productivity. Demand for low-qualified labour that provides services is also growing because, on the whole, high-qualified employees' earnings are increasing, and they spend a part of that on the market of services.

An alternative reason for the polarisation of the labour market may also be the intensive trade with developing countries. The inflow of cheap products of the manufacturing industry makes domestic production superfluous, which also primarily jeopardises the jobs of skilled workers in factories. However, this division also occurred in the markets of many developing countries, which is explained by the appearance of ICT. Moreover, foreign trade would also not be able to reach this high level without advanced information and communication technologies; consequently, polarisation is mainly attributable to ICT.

The polarisation of the labour market entails an increase in labour productivity, as the ratio of highly qualified and productive labourers rises. Workers performing routine tasks often change occupations when companies replace them with ICT, and therefore the total number of employees does not necessarily decline, but primarily the composition of the workforce changes.

Box 5-3: Changing employees, changing workplaces

Skills related to changing within and between jobs as well as the ability to adapt and learn are expected to become more valuable in the future. According to The Future of Jobs Report 2018 of the World Economic Forum, at present the three most important skills expected of employees are analytical thinking and innovation, complex problem-solving skills and critical thinking and analysis. In addition, the significance of active learning and the skills that allow it, as well as importance of creativity, originality and initiative is increasing. Digitalisation and robotisation play the strongest role in the fact that manual skills, persistence, precision and memory skills will lose some of their importance as the above are gaining ground. Not only are the expectations of employees changing, but – at least at the same pace – also those of employers. Those who are able to perform complex and high-standard or extremely creative work have high expectations towards their workplace as well.

With the entry of Generation Z onto the labour market, employees' attitude to work and their expectations are also changing gradually. The members of Generation Z are digital natives (since the mid-1990s, already born in the age of digitalisation). They usually spend more time in education than the previous generations, and they are described as inventive and strongly practical. Special characteristic features of Generation Z include freedom, innovation, speed, integration and high spirits. As a result of these characteristics, one of this generation's main attitudes to work is 'zapping', so job hopping is natural for them (Ferincz – Szabó, 2012). The tight labour market typical of the majority of developed countries and Hungary as well help the members of Generation Z to change jobs easily. With the appearance of Generation Z on the labour market the quality of the working environment becomes more important in retaining the workforce. In addition, the need to treat the occupational impacts (e.g. techno stress, burning out) originating from information overload is increasing. In Hungary, this purpose is served by the National Occupational Safety and Health Policy 2016–2022 (2016).

5.3 The role of health status

5.3.1 IMPACT OF HEALTH STATUS ON THE ECONOMY

Health status is an area where the interests of individuals, families, economic agents and the society as a whole coincide: everyone would like to live as long as possible and as healthily as possible. According to Hungary's Fundamental Law, 'everyone shall have the right to physical and mental health', which Hungary facilitates, inter alia, 'by organising healthcare provision, by supporting sports and regular physical exercise'.[60]

The health status of the population has a significant impact on both the quantity and quality of labour available in the economy. Similarly to the knowledge obtained during education, health status is part of the human capital stock that decisively determines the extent of economic growth. Health status has a major impact on labour market participation as well (and thus on the amount of workforce) and on productivity. Therefore, improving the health status of the population, i.e. providing them the possibility of a longer, healthily spent and active life, contributes to economic growth.[61]

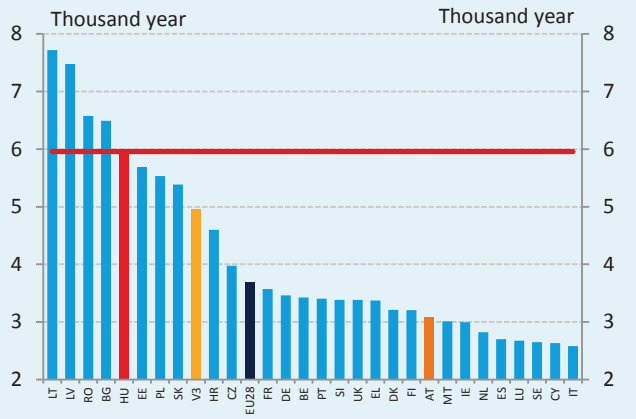
Depending on the degree of the deterioration in health condition, an individual's labour market participation may become limited at different levels. As a result of an illness or accident that involves more minor symptoms, the individual is only missing from the labour market for a shorter period of

[60] The Fundamental Law of Hungary (2011)
[61] European Commission (2013)

time. The magnitude of such temporary absences is estimated to be around 3–6 percent of the working time at economy level. Diseases with more severe symptoms may lead to job loss or even to permanent inactivity. According to certain estimates, 10 percent of those who had been employed before lost their previous jobs mainly due to health reasons.[62] As a result, in 2017, 4 percent of the working-age (15–74-year-old) population, i.e. 11.3 percent of the inactive population, was inactive due to health reasons in the European Union.[63]

Death occurring at working age also significantly reduces the labour force. One of the most important indicators of premature mortality is the number of potential years of life lost, which shows the number of life years lost due to death prior to a conventionally expected lifetime (70 years in this case) in a country,[64] i.e. in a given year, how many years more would those who died before reaching the age of 70 have lived in total until 70 years of age (e.g. in the case of an individual who died at the age of 56, this value is 14 years). This indicator is calculated for 100,000 inhabitants who are younger than 70, standardised for the age and gender distribution of the European standard population.[65] In 2015, on average, the countries of the European Union lost 3,692 potential life years per 100,000 inhabitants due to premature mortality, while Hungary lost nearly 6,000 years (Chart 5-21).

Chart 5-21: Potential years of life lost in the EU countries, 2015



Note: The cumulative lost years occurring to death prior to the age of 70 per 100,000 inhabitants.
Source: Eurostat (2018).

Dissatisfactory health condition also has a significant impact on the quality of the workforce, since individuals struggling with health problems cannot completely pay attention to their work, which reduces their productivity. Nearly one quarter of the European population suffers from some kind of chronic illness, which limits them in their everyday activity.[66] In the Central European region, on the basis of years lived with disability, back and neck pains (accounting for 15.6 percent of all injuries) represented the largest health burden.[67] Cardiovascular diseases, which are responsible for most of the mortality in the region, cause serious productivity losses already in the lives of patients (up to about 0.5 hour of lost working time a day), while for example those suffering from depression reported some 70 minutes lost per day.[68] Already these few examples reveal that the health status of the Hungarian population significantly impairs productivity and thus the growth prospects of the economy.

In addition to the labour market, the health condition of the population can contribute to economic growth through various other channels. Higher life expectancy increases the years in retirement, resulting in higher capital accumulation, i.e. a higher savings rate in order to ensure old-age consumption. In addition, higher life expectancy increases the period of utilisation of the investment in education, making private and public expenditures in this field more remunerative.[69] It is also worth mentioning that **health care is a fundamentally human capital and knowledge intensive sector, where employees' added value is higher than the whole-economy average. Accordingly, it can be one of the most remunerative fields of R&D&I activities.**

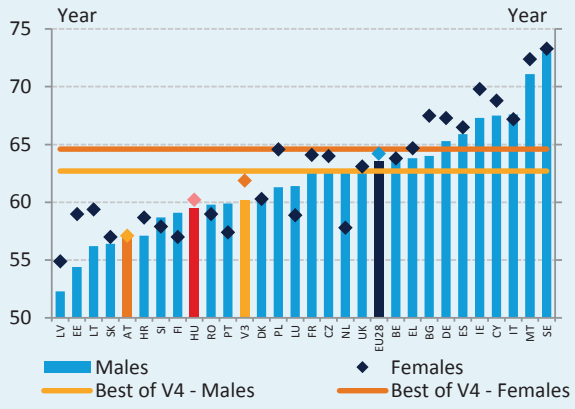
The impact of the health status on economic development is corroborated by empirical analyses as well. Bloom et al. (2004)[70] and Aghion et al. (2009)[71] came to the conclusion that **the level of life expectancy at the beginning of the period and its rate of increase also have a significant positive effect on the growth rate of GDP per capita.** At the same time, it is important to note that the impact of the development of the health care system is not the same in the case of developing and developed countries, as the size of the impact is affected by a number of other factors as well (e.g. level of education, degree of constraint).

[62] EUROFOUND (2010)
[63] Eurostat (2018)
[64] National Healthcare Services Center (2018)
[65] Eurostat (2018)
[66] European Commission (2011)
[67] WHO (2018)
[68] European Commission (2011)
[69] Magyar Nemzeti Bank (2015)
[70] Bloom et al. (2004)
[71] Aghion et al. (2009)

5.3.2 IMPROVING THE HEALTH STATUS OF THE HUNGARIAN POPULATION

Similarly to the countries of the region, the health condition of the Hungarian population falls short of Western European standards. Despite the falling trend, the loss of life years due to premature mortality is still high in Hungary, and within the Union the standardised death rate of malignant neoplasms is the highest here.[72] 45 percent of the active-age population reported limitations related to high blood pressure, 19 percent are obese, 14 percent diabetic and 14 percent suffer from some degree of depression.[73] These chronic illnesses reduce the productivity of labour, and their treatment is a serious burden for the care system (e.g. control examinations, regularly taken medicines).

Chart 5-22: Healthy life expectancy at birth, 2016



Source: Eurostat (2018).

The most efficient way of improving health status is changing lifestyle and not the changing of an element of the health care system. Actually, the health care system encounters the affected members of the population only when they already need medical treatment. The health care system can only provide symptomatic treatment to patients suffering from high blood pressure or diabetes; these illnesses cannot be cured, only prevented. If the health awareness of the population was successfully strengthened, and the number of those living a healthy life were increased significantly, that could greatly contribute to the improvement in the health condition of the population.

One major contribution to the sustainability of the health care system and to boosting healthy life expectancy would be if there was much more emphasis on prevention in the health care system than at present. The prevention system should cover the prevention of illnesses (primary prevention), the detection and treatment of existing illnesses as early as possible (secondary prevention) and the prevention of further deterioration of conditions in the case of patients with already developed diseases (tertiary prevention). The most important means for this is to set up a system of regular check-ups and screening; it would be expedient to store the results of such in a common database (National Health Database) for as efficient use of the data as possible. **In relation to strengthening the prevention system, the target we propose to be set is to reach a higher healthy life expectancy in Hungary than in the other Visegrád countries** (Chart 5-22), which also contributes to the increase in life expectancy at birth through the reduction of premature mortality.

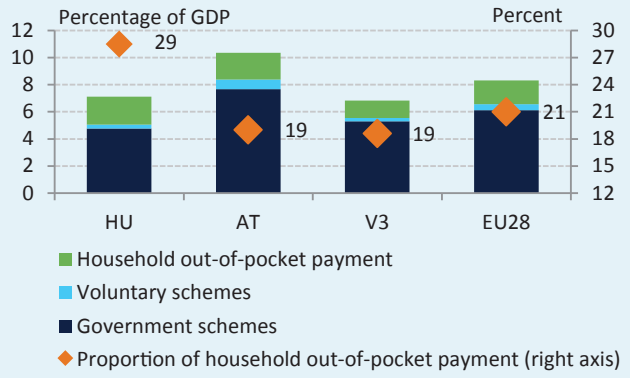
One of the main problems of the Hungarian health care system is that private expenditures on health are not spent in institutionalised forms, i.e. through health funds or private health insurance. The ratio of households' direct (out-of-pocket) contributions to total expenditures was 28.9 percent in 2015, which is much higher than in Austria (19.0 percent) or the average of the other Visegrád countries (18.6 percent) (Chart 5-23). By contrast, **expenditures through institutionalised channels amounted to only 4.2 percent of the domestic expenditures**,[74] which is not sufficient for the development of a privately-owned health provision system of adequate quality and coverage.

It would be expedient to reduce the ratio of households' out-of-pocket health care expenditures to below the average of the countries in the region. For this to occur, it is not absolutely necessary to increase public expenditures, as the efficiency of the use of private funds could be significantly improved if households' out-of-pocket expenditures were successfully channelled into the health funds that have an already existing domestic service system (with 1 million members and annual revenue of HUF 50 billion) or into the dynamically expanding private insurance business.[75] These institutions would be able to force the institutions of the provision system to become transparent, to enforce the separation of the public and private provision systems, the reduction of the hidden economy in the sector, the increase in economies of scale as well as compliance with the quality criteria that are important because of the safety of the provision. In addition, health funds and health insurers are able to agree on lower prices for patients, and the active use

[72] Magyar Nemzeti Bank (2017b)
[73] Eurostat (2018)
[74] Eurostat (2018)
[75] Magyar Nemzeti Bank (2018)

of these institutions would allow better financial planning of the health care services, and thus in the case of illnesses or accidents individuals and their families would not be exposed to major financial shocks.

Chart 5-23: Health care expenditures as a percentage of GDP, by financing scheme, 2015



Source: Eurostat (2018).

The Hungarian health care system struggles with various challenges, and the solution to these requires more than just increasing expenditures. The level of health care expenditures as a percentage of GDP exceeds the average of the countries in the region, but is below the average of the European Union and especially that of Austria (Chart 5-23). **Within the expenditures, the share of public expenditures is below average in Hungary, but at the same time an increase in public expenditures alone cannot solve the problems of the sector, which is mostly attributable to the fact that the available funds are not spent in an efficient manner.** Individual parts of the health care system attempt to be cost-effective separately, which does not result in the most efficient solutions at the system level. The financing system would be efficient if health policy focused on long-term, systemic cost effectiveness. The high level of pharmaceutical expenditure or the low level of bed utilisation represent efficiency reserves in the Hungarian health care system, the careful regrouping of which (for example, for preventive and primary care purposes) could free up internal sources of financing and also improve the health condition of the population.

5.3.3 POTENTIAL GROWTH IMPACT OF IMPROVING HEALTH STATUS

A health care system provides adequate support for economic development if it provides the healthy workforce needed by the labour market, uses the available resources in the most efficient manner possible, and is able to cope with the increasing pressure caused by the ageing society. The best approach for that is if it strives to prevent the development of diseases and diagnose them as early as possible. In addition, it should ensure the necessary provisions with a quality that is in line with the level of development of the given country.

If the health condition of the Hungarian population reached the targeted highest level among the Visegrád countries, that would – according to our estimate – increase the quantity of the available workforce by 1 percent (Table 5-2). The MNB's proposals primarily aim at the improvement of the health condition of the population, as it strongly affects the quantity and quality of the available workforce. In our estimation of the quantity of the workforce that can be potentially obtained, we took into account the achievement of three objectives. Firstly, we assumed that the **level of premature mortality will be successfully reduced by 20 percent in Hungary, to thus reach the average of the Visegrád countries in this respect.** Secondly, **the health care system would also contribute to the reintegration of the inactive into the labour market**, which is discussed in detail in the chapter on the labour market, **by sending some 10,000 people back to work (of the 75,000 people who return as indicated in the target, this many are inactive due to health reasons in proportion).** Unfortunately, no internationally comparable data are available on working days lost due to illness. Therefore, our calculations were based on the assumption that the total number of working days lost due to illness will decline again to the historical low in Hungary, i.e. to the level observed in 2013. If these three objectives were achieved, 8.8 million working days would be gained, which is 0.9 percent of the working days worked.[76]

[76] HCSO (2018)

Table 5-2: Estimated reduction of lost workforce

	Base	Change	Result
Number of days worked	943.4	+ 8.8	952.2
Losses due to deaths among people aged 15–64 (for that year)	3.8	- 0.8	3.0
Losses due to permanent inactivity caused by illness	96.3	- 2.4	94.0
Losses due to temporary illness (sick pay, sick leave)	31.3	- 5.6	25.7
Total losses	131.5	- 8.8	122.7
Total losses as a percentage of number of days worked	13.9%	0.9%	13.0%

Source: HCSO.

The calculations regarding the quantity and quality of workforce show that the dissatisfactory health condition of the Hungarian population contains significant reserves in terms of efficiency, productivity and growth. Nevertheless, its exploitation is a long-term process, whose results – even in the best case – can facilitate economic convergence in the medium term only.

5.4 Qualification of the labour force

5.4.1 IMPACT OF LABOUR FORCE QUALIFICATIONS ON THE ECONOMY

Qualification of the labour force is one of the most important determinants of the human capital stock, and thus is a significant factor in the long-term growth potential. There is positive correlation between human capital and GDP per capita: countries with more qualified human capital achieve higher GDP growth, while more developed countries spend more resources on improving the quality of their human capital as well. The degree of qualification of the human capital present in an economy is significantly influenced by the expansion and quality of its education system, although the role of knowledge and experience obtained during working cannot be neglected either.[77] Nevertheless, we must be aware that the effects of developing the education system are able to support economic growth mostly over the long term.

Examining the impact of the education system on growth has been a focus of economic literature for a long time. The process started in the 1960s with the adjustment of the production function with education, and gathered new impetus in the 1980s with the examination of the direction of the cause and effect relationship. In the 1990s, the new growth models already assumed the endogeneity of human capital, while they started to involve other non-financial benefits of education as well in the analyses (e.g. better health status, lower crime rate, reduction of environmental pollution). Starting from the 2000s, the emphasis of the analyses shifted from educational attainment and from the costs to the qualitative and efficiency factors of education.[78] In addition to the continuously developing macroeconomic models, since the 1970s the calculation of the (private and public) rates of return related to education has also been under review.[79]

Based on the 2007 study by Hanushek and Wössmann, education contributes to growth through three channels.[80] It raises the productivity and economic innovation potential of the workforce, while also promoting the acquisition of the knowledge necessary to understand and apply new technologies. Oketch et al. (2014) expressly examined the impact of higher education on economic growth by synthesising previous literature, and identified five well distinguishable channels: earnings, productivity, technology transfer, skills and institutions.[81]

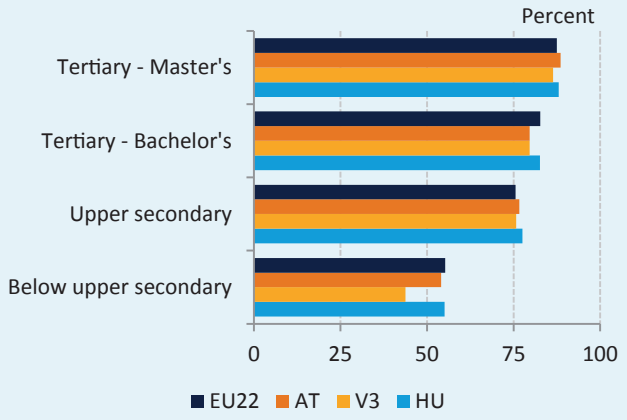
Supplying the economy with a well-trained workforce is indispensable for boosting the productivity of the economy and thus for pursuing sustainable convergence. One of the most important means of breaking out from the middle-income growth trap is education. The engine of innovation is human knowledge, the provision of which requires an extensive, good-quality system of education and training. The quality of the education system has a significant impact on developments in countries' future growth potential and competitiveness (educational

[77] Magyar Nemzeti Bank (2015)
[78] Oketch et al. (2014)
[79] In this field, particularly the work of James Heckman needs to be mentioned. He examines the efficiency of investments into the individual levels of education, and during his research he found that the earlier period of life the form of education where the investment is done, the greater the future returns of the investment will be.
[80] Hanushek – Wössmann (2007), Magyar Nemzeti Bank (2015)
[81] Oketch et al. (2014)

attainment and its effectiveness appear as positive components in the competitiveness indices as well). The OECD's 2010 analysis detected a positive correlation between improving the skills of students and economic growth,[82] while in their 2014 study Baumann and Winzar came to the conclusion that educational results have a 54 percent influence on competitiveness.[83]

The quality of labour supply is easiest to present with the educational level of the population. Highly qualified employees are more productive, their contribution to innovation is greater, and they adapt technological innovations more easily. More educated employees are generally characterised by higher labour market activity and employment rates (Chart 5-24).[84] In the coming decades, the transformation of the labour market will be significantly affected by automation and robotisation, as a result of which the demand for labour with low- and especially non-specialised secondary-level education is expected to decline,[85] further increasing the labour market advantage of those with higher (even general) qualifications.[86]

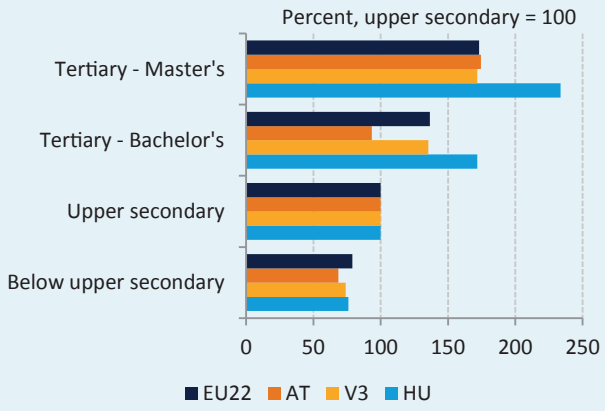
Chart 5-24: Employment rates by educational attainment (2017)



Source: OECD (2018a).

The earnings of employees with higher qualifications usually exceed the average earnings of those with a lower educational level, which is attributable to the higher productivity and low availability of those with higher qualifications.[87] The average salary of tertiary education graduates in the European Union is higher than those with upper or lower secondary level. (Chart 5-25.). At the same time, it is worth drawing attention to the fact that among graduates there are significant differences between the average wages of those with a bachelor's degree and those with a master's degree. Negative correlation can be detected between the wage advantage of graduates vis-à-vis those with secondary education and the ratio of those with tertiary education: where there are fewer graduates, the wage premium of further study is higher. In addition, the wage advantage of obtaining a tertiary degree can also be increased if the average wage level reachable with secondary education is low, or if there is oversupply of such labour in the labour market of the given country.[88]

Chart 5-25: Relative earnings of workers, by educational attainment (2016)



Source: OECD (2018a).

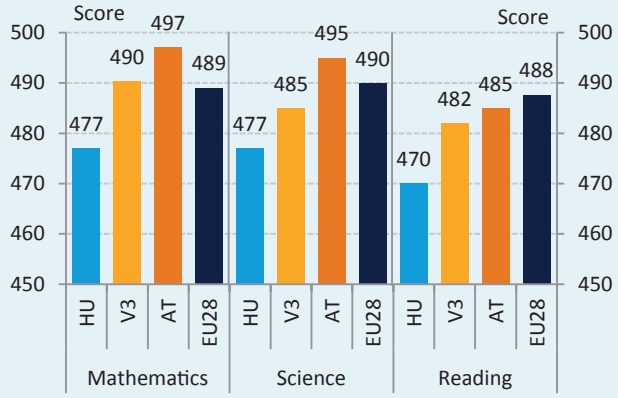
5.4.2 QUALIFICATION OF THE HUNGARIAN LABOUR FORCE

International surveys measuring the effectiveness of the education system show that although Hungarian students learn the subjects as expected of them, in the case of examples taken from real life they are unable to use what they learnt to an adequate degree (Chart 5-26). Hungarian students' performance was better in the TIMSS and PIRLS tests, which focus on checking the learnt curriculum, than in the PISA tests, which measure the practical application of the curriculum. In the case of the latter, a serious problem in Hungary is the high ratio of underperforming students: 18.5 percent of Hungarian students did not reach the minimum expected level in any of the three surveys

[82] OECD (2010)
[83] Baumann–Winzar (2014)
[84] Magyar Nemzeti Bank (2015)
[85] For more details see the box entitled 'The polarisation of the labour market'.
[86] Magyar Nemzeti Bank (2017a)
[87] Magyar Nemzeti Bank (2015)
[88] Magyar Nemzeti Bank (2015)

(mathematics, sciences, reading), while the corresponding ratio was only 13.9 percent on average in the EU countries in the latest test.[89]

Chart 5-26: Results of PISA tests (2015)

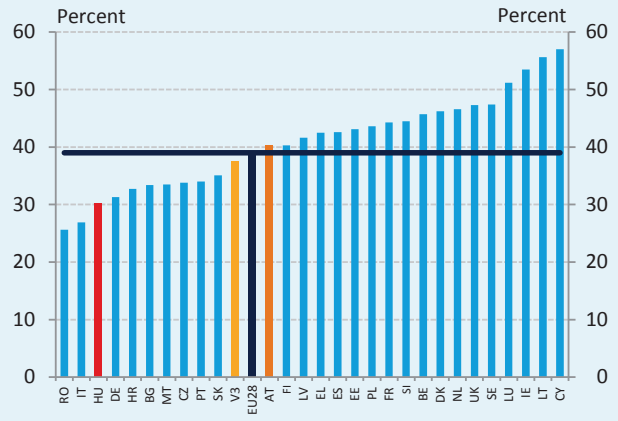


Source: OECD (2016).

The main challenge for the education system is to prepare the youth for a future state of the labour market that is increasingly difficult to predict because of the accelerating development. Students who started elementary school in 2018 will finish their secondary school studies in 2030 at the earliest and their tertiary studies in 2033, before entering the labour market. At the current pace of development, it is almost unimaginable what knowledge and skills they will need in their labour market career, for which the education system is supposed to prepare them.[90] At the same time, in the increasingly globalising world it seems clear that **digital knowledge and foreign languages (mainly the English language) will also be among the basic skills expected by the labour market**. At present, Hungary's performance in these fields is not very good (within the Union Hungary's ranking is the fourth worst in terms of speaking foreign languages);[91] therefore, the efficiency of the education system and students' basic skills need to be significantly improved, in order to reduce the country's lag in the future.

The ratio of graduates increased significantly in Hungary since the millennium, but remains below the level of Western Europe. In Hungary, 30 percent of the 25–34 age group had high-level qualification, while this ratio in Austria is 40 percent (Chart 5-27). In European comparison, the ratio of those who finished maximum elementary school only is not high in Hungary (17 percent), but the average in the other Visegrád countries is half of that (8 percent).[92] In a regional comparison, the high ratio of early school leaving (12.5 percent of Hungarian students leave the education system without qualification, while the average in the Visegrád region is 7 percent)[93] represents a significant competitive disadvantage for Hungary. Despite the extensive early childhood education, this is partly the consequence of the fact that the Hungarian education system is still not able to efficiently reduce the differences stemming from students' social and economic backgrounds.

Chart 5-27: Tertiary educational attainment, age group 25–34 (2017)



Source: Eurostat (2018).

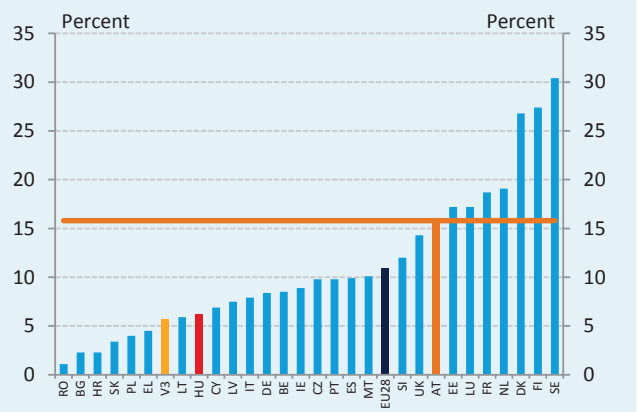
The development of Hungarian tertiary education and improvement of its international competitiveness are indispensable for sustainable convergence. At present, none of the Hungarian higher education institutions are among the leading universities of the world, which makes it difficult to keep the most talented students in Hungary. Nevertheless, the international assessment of Hungarian higher education cannot be considered to be poor. According to OECD data, in 2015 more than twice as many foreign students studied in Hungary (22,000) than Hungarian students abroad (11,000).[94] However, to increase the ratio of tertiary graduates in Hungarian society, it is necessary to raise the domestic expenditures on higher education as well as to develop the institutions. In addition, it would be worthwhile to increase the number of graduates in the areas of sciences (science, math, computing, engineering, manufacturing, construction) in Hungary, as it also falls behind the countries of the region in this indicator, which may mean a

[89] Magyar Nemzeti Bank (2017b)
[90] Magyar Nemzeti Bank (2017b)
[91] Eurostat (2018)
[92] OECD (2018b)
[93] Eurostat (2018)
[94] OECD (2018b)

competitive disadvantage in the area of investment with high added value, containing R&D&I activities as well.

It would also be progressive if the attitude that it is possible to meet the challenges of the modern era only with the help of continuous (self-)development would spread in the Hungarian society. A contribution to this would be if the Hungarian education system primarily outfitted students with the need and ability to continuously learn. It is also worth supporting participation in lifelong learning because – as opposed to other elements of the education system – it is able to contribute to economic growth already in the short run as well. **New qualifications obtained within the framework of adult education as well as the knowledge obtained during corporate courses and trainings can all expand individual employees' knowledge, skills, adaptation to challenges and productivity** (Chart 5-28).

Chart 5-28: Participation in lifelong learning (2017)



Note: Ratio of participants in education or trainings in the previous 4 weeks in the 25–64 age group.
Source: Eurostat (2018).

5.4.3 POTENTIAL GROWTH IMPACT OF IMPROVING THE LEVEL OF QUALIFICATION

Improving the qualification of employees can have a significant positive impact on economic growth over the long run. In its analysis prepared in 2010, the OECD verified that improving the quality of education (i.e. in this case the results of the PISA survey) has a significant impact on growth.[95] In their 2014 study, also examining the OECD countries, Madaras and Varga found that a one percentage point increase in the public education expenditures-to-GDP ratio, *ceteris paribus*, increases the results achieved in the PISA tests by nearly 11 points.[96] Based on the literature on the results of education and GDP growth, it is worth investing in education as it increases the economy's growth potential. It is worth noting, however, that at the economy level, expenditures on (public) education pay off only over the long term; the achievement of short-term results requires further strengthening of adult education and the system of training.

In Hungary, the public and private rates of return on participation in higher education are high in an international comparison. A widely applied method in examining the economic usefulness of education is the calculation of rates of return, which examines the return on education as an investment instead of examining the impact on economic growth. In its publication entitled Education at a Glance,[97] the OECD regularly publishes its calculations for countries, where it takes into account the costs related to education and the income lost during the time of instruction as well as the higher wage level linked to the higher level of education (together with the relevant tax and contribution effects) and the lower unemployment. According to the latest calculations, in Hungary in the case of both sexes (the difference is caused by the different levels of wages and employment by sexes) the private and public rates of return on participation in higher education are significantly higher than the EU or regional averages (Table 5-3). This means that both the individuals participating in education and society would significantly benefit from increasing the ratio of graduates.

[95] OECD (2010)
[96] Madaras – Varga (2014)
[97] OECD (2018a)

Table 5-3: Costs and benefits for attaining tertiary education (2015)

		Private	
		Net financial returns	Internal rate of return
HU	Males	339 300	20.4%
	Females	156 900	13.6%
V3	Males	275 333	13.4%
	Females	167 500	13.2%
AT	Males	309 700	10.0%
	Females	166 900	8.6%
EU22	Males	242 500	9.7%
	Females	177 700	13.2%
		Public	
		Net financial returns	Internal rate of return
HU	Males	173 500	15.0%
	Females	76 500	9.2%
V3	Males	93 667	8.5%
	Females	50 833	6.9%
AT	Males	224 500	7.9%
	Females	97 500	5.7%
EU22	Males	156 200	9.7%
	Females	84 700	8.6%

Note: compared to attaining upper secondary education. The net return is expressed in equivalent USD based on the PPPs used for the GDP calculation. Future costs and benefits are discounted by 2 percent.
Source: OECD (2018a).

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6 Strategy for the development of Hungarian enterprises

In the interests of convergence, it is essential to switch over from an extensive growth path to an intensive growth path. Therefore, one of the key elements of the reform path presented in Chapter 3 is the improvement of productivity. In a market economy, the corporate sector is expected to generate productivity growth. This chapter examines how the Hungarian corporate sector can achieve annual average productivity growth of around 4.0 percent on the reform path. If the objectives indicated in this chapter are reached, the labour productivity of small and medium-sized enterprises will double, with an annual average increase of nearly 6 percent in their per capita output. The productivity of large corporations will rise by more than 40 percent by 2030, corresponding to annual average growth of 3 percent. In addition, the objectives described in this chapter contribute to increasing the capital–labour ratio, boosting the investment rate of companies, narrowing the gap between GDP and GNI, and maintaining the current account surplus. Moreover, they support the rise in the employment rate.

Due to their weight in employment and value added, small and medium-sized enterprises constitute the most important target group for the development of enterprises. In the case of this group, the most important task at present is to ensure the more efficient use of capital and labour via the mobilisation of growth reserves. Firstly, the structure of the Hungarian small and medium-sized enterprises sector is extremely fragmented, and thus the domestic SME sector does not sufficiently utilise the advantages stemming from economies of scale. According to our calculations, if a more concentrated SME structure came into being, the productivity of the SME sector would be more than 20 percent higher. Secondly, Hungarian SMEs also use the already available advanced technologies to a lesser extent. Therefore, the stronger penetration of available technologies alone would also significantly stimulate the performance of Hungarian small and medium-sized enterprises.

One long-term objective is to create an entrepreneurial ecosystem that significantly contributes to the revival of the economy and the increase in its flexibility. This means the most important task is to achieve growth in companies' research and development expenditures, both in terms of quantity and efficiency. As far as innovation is concerned, it can be established that Hungarian small and medium-sized enterprises are considered low innovators in a European comparison. In Hungary, only 1 out of 5 SMEs is engaged in innovation, while the corresponding figure for more developed European countries may even be twice as high. This lag is attributable to various factors, the most important of which are the shortcomings in entrepreneurial culture and the lack of willingness to cooperate between companies and higher education institutions. In addition, a number of studies have verified that entering foreign markets and joining international production chains are important innovation incentives for SMEs. Participation in foreign trade entails higher corporate employment, labour productivity and total factor productivity, and exporting and importing enterprises are more competitive both in the external and domestic markets. Based on our estimate, around 10,000 new exporting companies would allow for a major increase in productivity.

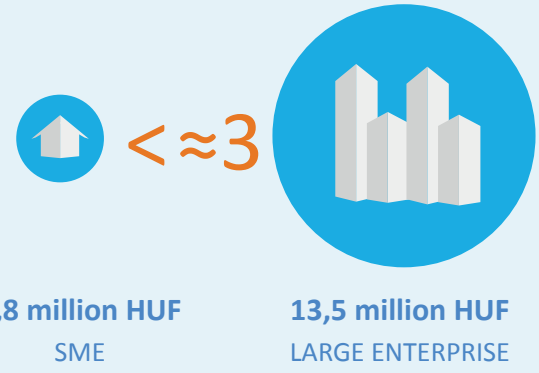
Considering that Hungary's integration into global value chains and its economic openness are remarkable in a European comparison as well, the macroeconomic benefits of the foreign-owned companies that are already active in or that will come to Hungary in the future as well as the relevant spillover effects should be maximised. Empirical data show that if the main sectors of the economy produce with high import use, an economy with low internal value added creating ability will come into being. Therefore, it would be expedient to support the knowledge-intensive services sectors, which may simultaneously increase the ratio of domestic orders in the national economy as a whole, and within that in manufacturing production as well, stimulating value-creating ability and productivity. In addition, instead of the earlier sectoral focus, modern development policy should strive to support technologies that fit into global developments. Finally, we analysed Hungarian companies' opportunities abroad and came to the conclusion that in Hungary's broader region there is room for Hungarian investment or in certain cases even for the outsourcing of partial tasks.

KEY INDICATOR	LATEST VALUE	TARGET VALUE FOR 2030	SOURCE
Ratio of small and medium-sized enterprises	small: 7.6%; medium-sized: 1.4% (2015)	small: 15.6%; medium-sized: 2.9%	NTCA corporate tax database (control: HCSO)
TOP 30 in the GEI ranking	50 (2018)	30	GEI publications
TOP 50 in the GCI business sophistication index	60 (2017)	50	GCI publications
Wage difference between company categories	33.7% (2017)	23.6%	HCSO Institutional labour statistics
Participants in training as a percentage of employees (SMEs)	12.5% (2015)	27.4%	Eurostat
SME investment rate	13.2% (2015)	15.2%	NTCA corporate tax database
Dissemination of advanced technological solutions among SMEs	average 60% improvement in partial indicators		Eurostat (European ICT usage survey)
Ratio of gazelles (gazelles as a proportion of all active companies measured by sales revenue)	1.6% (2015)	4.3%	Eurostat corporate demographic data
Increasing the ratio of SMEs engaged in product or process innovation	20.8% (2014)	30.3%	Eurostat CIS
Ratio of SMEs engaged in organisational or marketing innovation	18.6% (2014)	27.1%	Eurostat CIS
Productivity of the SME sector (HUF million/person)	4.8 (2015)	9.6	Eurostat
Increasing the R&D headcount (as a percentage of all employed persons)	0.82% (2016)	1.35%	HCSO
R&D expenditures of the business sector as a percentage of GDP	0.9% (2016)	1.3%	HCSO
R&D expenditures as a percentage of GDP	1.2% (2016)	1.9%	HCSO
Impact factor (Hirsch number [H-index])	390 (2017)	555	SCImagoJr
Number of registered new patents	37 (2015)	53	WIPO
Number of exporting SMEs	32,162 (2014)	42,000	NTCA corporate tax database
Services trade within foreign trade as a whole	20.1% (2017)	28.4%	HCSO
Ratio of input of imports in production	65.2% (2010)	60%	HCSO use tables
Share of market services within GDP	49% (2016)	55%	HCSO national accounts
Increasing the domestic value added in exports	53% (2014)	79%	OECD TiVa

Introduction

One of the most important conditions for sustainable convergence is to increase corporate productivity. **In the reform scenario, on the whole, we assume annual productivity growth of 4.0 percent on average, which is considerably higher than the previously recorded figures** (the rate was 1.8 percent between 2000 and 2017). The domestic corporate sector is characterised by significant heterogeneity; the main differences between large corporations and SMEs are observed in productivity, capital intensity and wages. Development policy must be formulated with an eye to this heterogeneity.

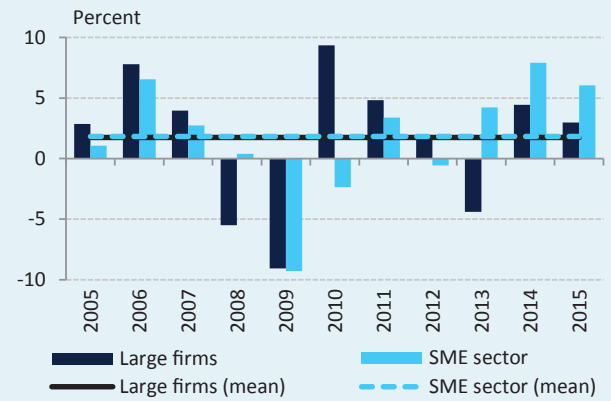
Chart 6-1: Per capita difference in productivity between SMEs and large corporations



Source: MNB.

Average annual growth of 3.0 percent in the large corporation sector and 6.0 percent growth in the SME sector is needed for the Hungarian economy to reach the productivity growth rates presented in the reform path (Chart 6-1). The magnitude and complexity of the challenge is underscored by the fact that in recent years average productivity growth in the corporate sector was lower than the above figures in both company groups.

Chart 6-2: Changes in labour productivity (2005–2015, percent)



Source: MNB, based on NTCA.

Due to their weight in employment and value added, small and medium-sized enterprises are the most important target group for the development of enterprises. In this group, **at present mobilising the demonstrable growth reserves in the SME sector represents the greatest potential**. Additionally, **an entrepreneurial ecosystem should be created** that significantly contributes to the revival of the economy and the increase in its flexibility.

In addition to the SME sector, it must also be taken into account that the world has changed significantly in the past three decades, along with the fact that nowadays **global value chains** fundamentally determine the productivity of a country. Considering that Hungary's integration into global value chains and its economic openness are remarkable in a European comparison as well, **the macroeconomic benefits of foreign-owned companies** that are already active in or will come to Hungary in the future as well as the relevant spillover effects **should be maximised**. In addition, in the case of Hungarian medium-sized and large companies the direct investment opportunities arising in the region should also be utilised in a more intensive manner.

In the following, we provide an overview of the most important challenges and tasks related to the development of Hungarian enterprises. First, the challenges affecting the SME sector are discussed, followed by an analysis of the structure of the economy and its ability to create value.

6.1 Development strategy of small and medium-sized enterprises

The SME sector is crucially important on the convergence path. Firstly, this is explained by the weight of SMEs: the SME sector accounts for 71 percent of corporate employment, 47 percent of value added and 20 percent of exports. In addition, the SME sector is mostly Hungarian-owned and is much more embedded in the Hungarian **economy than the foreign-owned large corporations, which often operate in isolation.**[98] Consequently, the SME sector is an important player in the Hungarian economy.

Secondly, significant productivity reserves can be identified in the SME sector. According to our calculations, this productivity gap partly stems from the structure of the sector, and

[98] Concerning island-like operation and low multiplicative characteristics see Subchapter 4 on the structure and value-creating ability of the economy.

on the other hand the reason for the lag is that Hungarian small and medium-sized enterprises do not apply the solutions and methods that are easily available at present.[99]

Thirdly, in the digital age the world is changing more rapidly than at the times of previous industrial revolutions. **In this accelerating and gradually networking world, low-productivity, isolated companies will not be able to survive.**

In respect of development policy, the SME sector should follow two directions that run in parallel with one another but different in terms of time horizons. **Firstly, by promoting the application of recent technologies and with the consolidation of the corporate sector, it is necessary to free up the productivity reserves** that are easy to mobilise in the Hungarian SME sector. **Secondly, putting the SME sector on an intensive growth path based on revival, innovation and corporate flexibility can be considered a longer-term challenge.** This is what we call a corporate ecosystem.

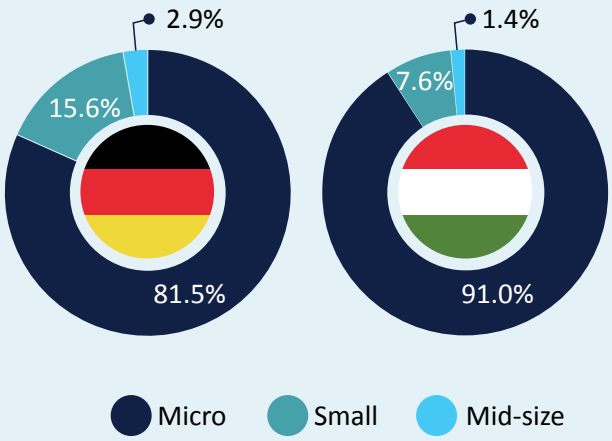
6.2 Productivity reserves

For the SME sector, productivity reserves are those elements that are relatively easily available for enterprises or can be freed up by positively changing the corporate structure. Intervention results in the largest and fastest returns in these areas.

6.2.1 BETTER UTILISATION OF ECONOMIES OF SCALE

The structure of the Hungarian SME sector is extremely fragmented, and the ratio of micro enterprises significantly exceeds the weight observed in developed economies (Chart 6-3).

Chart 6-3: Shares of companies operating in the Hungarian and German SME sectors by size categories in 2015 (percent)

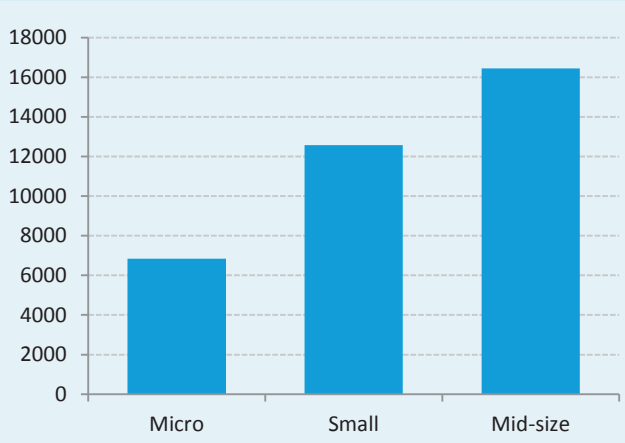


Sources: OECD, MNB calculation.

Moreover, taking an average micro enterprise as a basis, according to NTCA data for 2015, the value added per employee in an average small enterprise and an average medium-sized company is 1.84-fold and 2.27-fold, respectively.

Of course, it is also important to examine the reason why larger companies' per capita value added, i.e. labour productivity, is higher. Usually, two underlying factors are identified. Firstly, there may be differences in capital intensity (i.e. the amount of capital per employee) across companies of various sizes. **Larger companies are typically more capital intensive, as shown in Chart 6-4.**

Chart 6-4: Capital stock per employee (2015, HUF thousand)



Source: MNB calculation based on NTCA data.

[99] See Part 3.1.2 on the adaptation of advanced technologies.

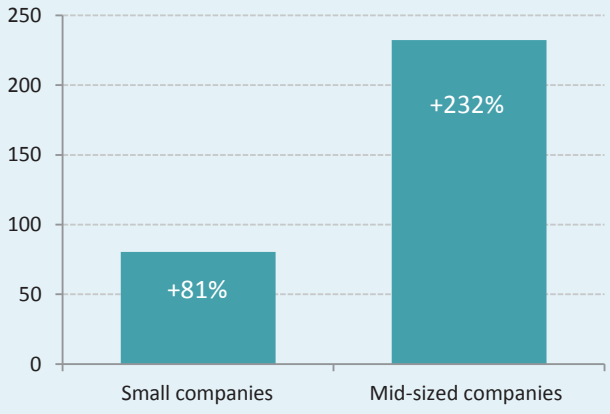
However, the difference in productivity that is not explained by the difference in capital intensity is more interesting for us. This is the so-called total factor productivity (TFP), i.e. the part of the volatility of economic output that cannot be explained with factors of production (namely, with changes in labour utilisation and capital utilisation). TFP can be considered as a general productivity indicator that shows how efficiently a given economy, sector or company, or even organisational unit, is able to transform inputs (i.e. capital and labour) into output, i.e. GDP. The value of TFP may be determined by various things: the sector in which the company operates, the year when the observation is carried out, and the size of the company also has a significant impact.

Box 6-1: How to measure economies of scale at the company level?

There are various ways to estimate total factor productivity. **The basis of the estimates is the corporate production function, in which the capital and labour used in production are the inputs.** Capital typically means the goods participating in production (tangible and intangible assets), while the amount of labour used can be approximated with the workforce participating in production. The non-observed side of the production equation is total factor productivity itself, which can be estimated with a regression method. Due to its simplicity, the aforementioned method may seem obvious, but in order to have reliable results it is worth addressing some statistical and economic problems. Firstly, there is an endogeneity problem between the quantity of the factors of production used up and productivity shocks. Secondly, observations eliminated from the sample due to bankruptcy (companies) result in selection bias. In order to manage the problems, Olley and Pakes (1996) came up with a new method, identifying productivity shocks with corporate investment. Although this method allows for the treatment of most of the deficiencies in the estimation, unfortunately, in the case of many companies the value of investment in the given period is zero. Consequently, observations are lost. This was remedied by Levinsohn and Petrin (2003) by using energy or material cost in lieu of investment, thus developing the method of Olley and Pakes. In our analysis, company-level productivity is estimated using the Levinsohn–Petrin method with the data of domestic enterprises that use double-entry bookkeeping. Then, TFP is estimated at the company level between 2004 and 2015 with the help of a panel regression model. Various corporate characteristics (age of the company, sector and year fixed effects) as well as a size dummy variable are taken into account. The size dummy can basically be considered the productivity surplus of the size leaps, as in the case of TFP the effect of capital deepening has already been excluded from the examination, and in addition we also controlled for corporate characteristics.

According to our calculations, only due to economies of scale, an average small enterprise is 80 percent more productive than an average micro enterprise, while an average medium-sized company is 230 percent more productive than an average micro enterprise. Therefore, through the economies of scale, the distribution of the capital of the SME sector across micro, small and medium-sized enterprises significantly affects the performance of the SME sector as a whole and thus of the macroeconomy as well. **In the current fragmented structure, the Hungarian SME sector does not utilise the competitive and productivity advantages stemming from economies of scale.**

Chart 6-5: Impact of size in total factor productivity compared to micro enterprises



Sources: NTCA database, MNB calculation.

Therefore, extremely significant economic potential can be identified in the consolidation of the SME sector in Hungary. For the identification of this potential, we created a model, in which we quantified the productivity increase originating

from the consolidation of domestic micro enterprises. In the model, we quantified the productivity effect of a hypothetical transformation, where the structure of the SME sector would be similar to the structure of the SMEs in Germany, which are considered to be one of the most productive SME sectors in the world. The boundary conditions of the calculation are as follows:

1. We fixed the capital–labour ratio of average micro, small and medium-sized enterprises in line with Chart 6-4.

2. We fixed the advantages of economies of scale in the cases of micro, small and medium-sized enterprises in line with Chart 6-5.

3. Corporate consolidation can redistribute only the current workforce; involving additional labour is not possible. The sector can obtain the necessary amount of capital through borrowing or capital increase. At the same time, in our estimate we took into account only the surplus of the productivity returns of consolidation stemming from economies of scale. Productivity returns originating from capital intensity are disregarded here.

4. The structure of the German SME sector was considered the reference value in line with Chart 6-3.

Based on our calculations, if the consolidation of the SME sector resulted in the structure of the German SME sector, the productivity of the SME sector would be 20 percent higher. This would tangibly reduce the shortfall of the SME sector compared to large corporations, but by no means would it be sufficient alone to bridge the productivity gap between SMEs and large corporations.

It is important to note that in this **calculation only static effects were taken into account**, i.e. we did not examine the effects that may arise as a result of the fact that small and medium-sized enterprises also grow faster than micro enterprises. With a dynamic approach, growth may be even higher, and thus consolidation of the domestic SME sector may provide major medium-term growth reserves.

6.2.2 ADOPTION OF ADVANCED TECHNOLOGIES

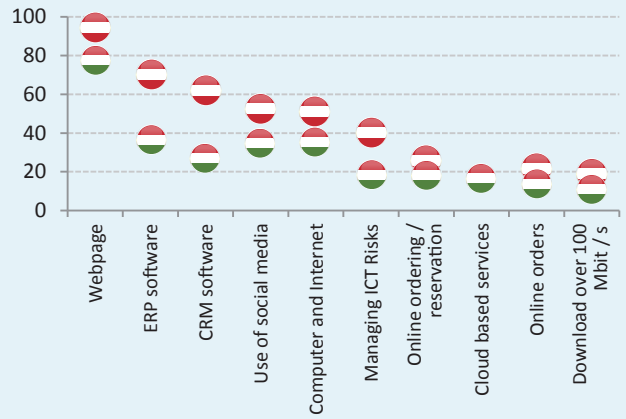
In a study prepared for the OECD, Andrews et al. highlighted that **although new technologies are spreading fast across countries, they are spreading much more slowly across companies within the country than before (Chart 6-6)** (Andrews et al. 2018). This happens despite the cheap availability of landline Internet and smartphones for almost all enterprises. It does not matter if the Internet (general purpose technology)[100] is available if the digital applications that require a more receptive environment (big data, CRM, ERP systems) are hardly spreading. **Therefore, it is worth providing policy support to the diffusion and adoption of technologies**, for example by supporting the knowledge transfer of leading technological enterprises.

In international comparisons, the position of the Hungarian SME sector is particularly poor in the application of advanced infocommunication technologies (Chart 6-6). 1 out of 5 SMEs does not have a website, and only every third SME uses social media platforms. This is the situation, in spite of the fact that technological solutions have now reached the level that the creation of a website or social networking site does not require any special IT knowledge. The ratio of employees using computers is also very low, while about half of the companies using infocommunication systems are not prepared to adequately manage IT risks. With this, we wish to make it clear that with a change of attitude and the application of currently existing solutions alone **it would be possible to raise productivity without any additional innovation carried out by companies.** Of course, it could increase productivity only for some time; arriving at the next intensive growth period already requires further skills. In addition, further government measures are needed to extend the intellectual horizon and improve financial awareness in order to make this group more receptive to innovation.

It is important to note that **merely supporting the introduction of various production organisation and digital devices is not equivalent to freeing up productivity reserves.** 'Soft' factors, such as adequate receptiveness on the part of companies, can be considered given in certain segments, but not in others. The openness of entrepreneurs is fundamentally affected by the quality of **the corporate ecosystem** as well. Therefore, it is important to discuss this subject matter not only from the aspect of innovative enterprises.

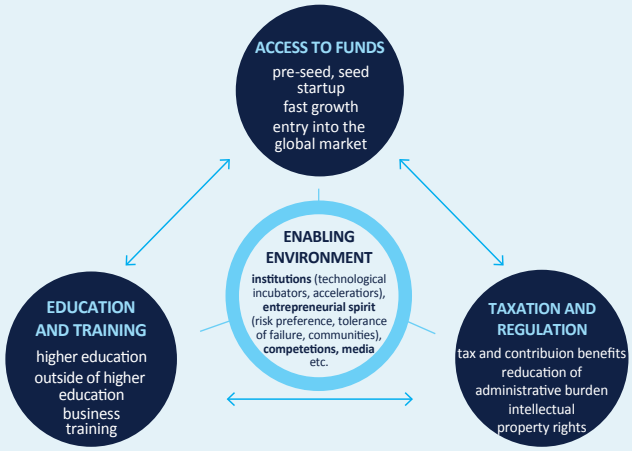
[100] For more details on general purpose technologies, see Chapter 5 of the Growth Report 2017.

Chart 6-6: Ratio of medium-sized enterprises using advanced technology (2015)



Note: Companies with more than 10 employees.
Source: Eurostat.

Chart 6-7: Elements of the corporate ecosystem



Source: Runway Budapest 2.0.2.0.

6.3 Corporate ecosystem

Modern enterprise development approaches go beyond the analysis of a company's internal processes, and – contrary to the macro attitude – they place a strong emphasis not only on quantitative (e.g. capital stock), but on qualitative factors (cooperation channels, quality of the institutional system) as well. The basis of the idea is that in modern economies not only size effects prevail, but **nowadays it is the speed of adjustment that really matters**. Companies that are able to rapidly adapt make the economy productive. **Quick adjustment, however, is not only an individual corporate feature**, but just as a biological community is constituted by many species together with mutual interdependencies, the same is true for companies and their environment as well. This is denoted by the term 'corporate ecosystem'. **In addition to companies, elements of the ecosystem include education and training, access to resources, taxation and regulation, as well as a supportive environment.** The combination of these factors determines how flexible a company can be vis-à-vis the challenges of the changing world (Chart 6-7).

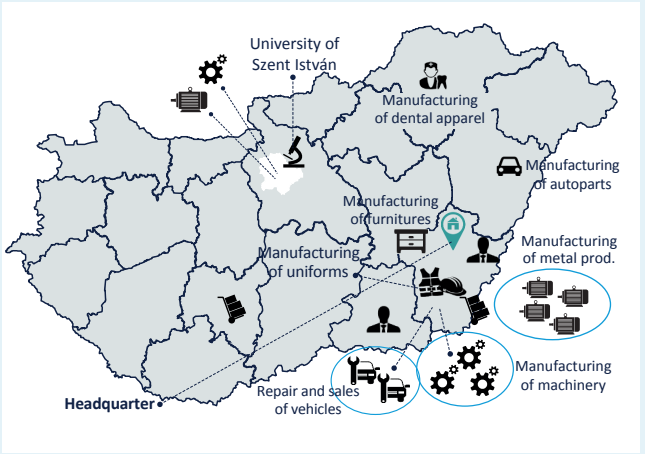
The functioning of the ecosystem is influenced by the quality and quantity of informal and formal channels. **Significant correlation is identified between business sophistication and productivity.** Corporate cooperation channels played a key role in the development of the most successful ecosystems, such as Tel Aviv, Beijing, Stockholm or the Silicon Valley. Such ecosystems are characterised by the following economic elements (Moon, 2017):

1. **universities** bring up talents,
2. **mentor networks** are available,
3. adequate **infrastructure** evolves,
4. **financing** ecosystem is available,
5. **start-up culture**,
6. **frameworks** of institutional and policy support,
7. **solid economic bases**.

Clusters, which are essentially **forms of cooperation that cover various activities, can be considered such corporate ecosystems. Clusters are in fact extensive ecosystems across sectors and geographically** (Chart 6-8).[101] In our opinion, clusters should be given a much greater role in the economic development system, as it is a standard practice in a number of developed countries (see e.g. Canada Innovation Superclusters Initiative). Supporting clusters may also facilitate the creation of specialised economies of scale advantages.

[101] It is important to note here that, of course, clusters also have a sectoral focus, but their activities simultaneously cover various sectors, with several companies that operate independently of one another. Among the clusters classified as the best, the number of IT, health industry and vehicle industry clusters is the highest.

Chart 6-8: Activities of the members of a metal industry cluster in Hungary (2018)



Sources: Klaszter, Céginfo, MNB.

The Hungarian **innovative corporate ecosystem, which is mainly located in Budapest, may strive for a regional leading role.** Although in recent years the number of the various forms of corporate cooperation, such as **incubators and clusters**, has been increasing, the 'critical mass' perceivable at the whole-economy level has not developed yet. In order for this to occur, the policy must work towards building an ecosystem based on cooperation, in consultation with those concerned. Work of this nature has already performed in Hungary with the participation of professional organisations, ministries and financing institutions, and thus the previous good examples may facilitate further development.[102] In 2017, as a progressive element, the Government introduced a **corporate tax allowance for business angels**. This was a major step in the stabilisation of the seed phase, which is the most difficult phase of financing (for information on the financing difficulties of companies by life cycle, see Chapter 4 on the financial system). Including this element in the tax law is also a milestone in Hungary because with this change start-up firms, which had been interpreted in different ways, became legally defined as well, and with the participation of the Hungarian Intellectual Property Office it became theoretically possible that investment supported by taxes is received by truly innovative enterprises.[103] Supporting the operation of incubators also contributes to the evolution of the ecosystem.[104]

The corporate ecosystem features a number of elements that are discussed in other chapters of the Growth Report (human capital, financing). This subchapter focuses on research and development, innovation and the expansion of foreign trade activity.

6.3.1 RESEARCH, DEVELOPMENT AND INNOVATION

In modern economic policy practice, it is often a planning problem that **the dividing lines between R&D and innovation become blurry**. As a result, incorrect conclusions are often drawn, hindering adequate state support for this area.

Both R&D and innovation can be carried out by state-owned or private companies, which can be either profit-oriented or not; the important differences are in the activity itself. In the earlier classical supply approach of **research and development**, research precedes innovation. This phase, which can be basically divided into three periods (basic research, applied research and experimental development),[105] **is driven by researchers' curiosity**. By contrast, innovation basically refers to a market process. It is important to clarify this because – in contrast to research and development – innovation is not done for its own right, but for the achievement of the organisation's objectives related to market/human demand. **One of the most important means leading to innovation is research and development**, basically characterised by the use of scientific methods. **At the same time, innovation may also be a new way of packaging, work organisation technique or the transformation of a product due to entering a new market.**

In the past, R&D and innovation were typically considered linear processes, but in the modern approach an iterative relationship based on mutual feedback can be discovered. In past years, there were numerous examples of market (human) needs inspiring research and development, mainly in the field of life sciences. Therefore, it is also important to see that **no order of priority can be set up between R&D and innovation, as they are indispensable complements of one another.**[106]

[102] Budapest HUB project. For more detailed information see the publication 'Runway 2.0.2.0 Startup Credo', available here: http://nih.gov.hu/download.php?docID=26009. In terms of clusters, the cluster accreditation system should also be mentioned. For more details, see http://klaszterfejlesztes.hu/content.php?cid=cont_4ffdb63e693227.48747265

[103] For more details, see Government Decree 331/2017 (XI. 9.).

[104] As a result of EU co-financing, 11 incubators received funding amounting to at least half a billion forints to stimulate the development of start-ups, of which 8 are working at locations outside Budapest. For more details see https://nkfih.gov.hu/hivatalrol/hivatal-hirei/harom-kozep

[105] Act CXXXIV of 2004 on Research and Development

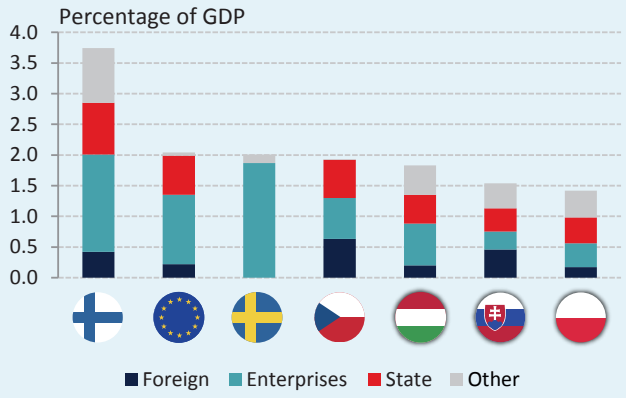
[106] A major player in research and development is the state, and compared to innovation, much harder data are available. Consequently, the demands of participants can be analysed at the system level. The data make a system-level analysis much more difficult in relation to innovation.

Considering that innovation often takes place using the results of research and development, we first analyse the research and development system in brief, before discussing innovation.

6.3.1.1 Research and development

In recent decades, many studies discussed **the close correlation between the ratio of funds spent on R&D and the level of development** (e.g. Meo et al., 2013; the summary by Griffith, 2010; or Bassani – Scarpetta, 2001). For 2020, Hungary has set a research and development expenditure target of 1.8 percent of GDP, which is higher than the current figure (less than 1.5 percent). International comparisons reveal that convergence requires a significant **narrowing of the gap compared to the EU average**. Public R&D expenditures may also be considered relatively low in a European comparison, although a bigger lag **is seen in corporate R&D spending** (Chart 6-9).

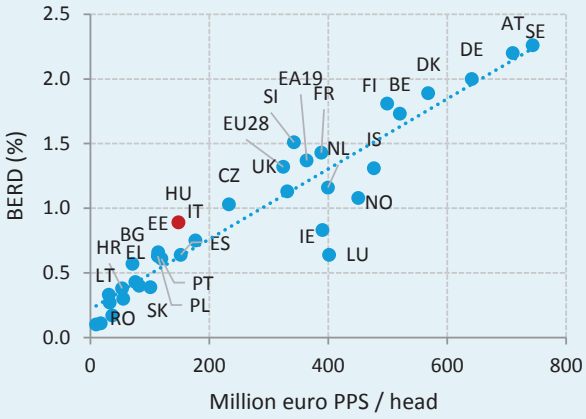
Chart 6-9: R&D expenditures by source of funding (2015)



Note: Other – rest of the world, non-profit organisations.
Source: Eurostat.

The situation is no better in terms of corporate R&D expenditures, which are more important in respect of this chapter. **Hungary is ranked 16th in respect of business R&D expenditures as a proportion of GDP (0.9%)** (Chart 6-10). **Catching up with the EU average would require a ratio of around 1.3 percent, which would support the TFP growth presented in our macroeconomic path** (Chapter 3).

Chart 6-10: Business expenditures on R&D as a percentage of GDP (BERD indicator) and in absolute terms (2016)



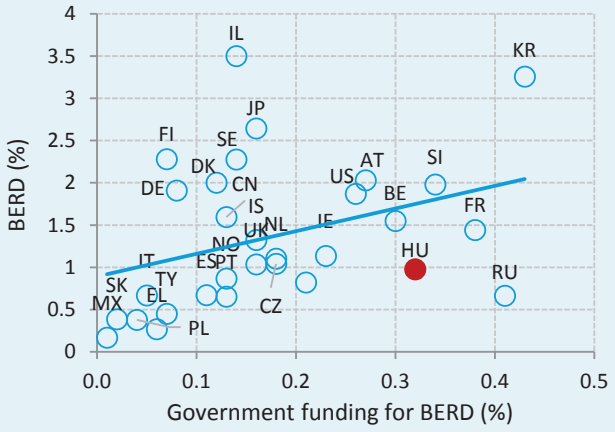
Source: Eurostat.

Accordingly, increasing the corporate R&D ratio is a key issue for convergence. It is also important for companies to perform R&D activities in the widest possible range. **In Western Europe, every third small or medium-sized enterprise spends on research and development, while in Hungary only every 4th or 5th firm does so (Eurostat CIS survey, 2014).**

To improve the situation, the Government recently took various tax and direct support-type measures, creating **one of the most generous R&D support environments in the region.** Nevertheless, R&D expenditures by the corporate sector amounted to only 0.9 percent of GDP in 2016, only slightly higher than the 0.5 percent spent ten years earlier. Accordingly, it is also apparent that **the efficiency of government support for business research and development is low** (Chart 6-11).

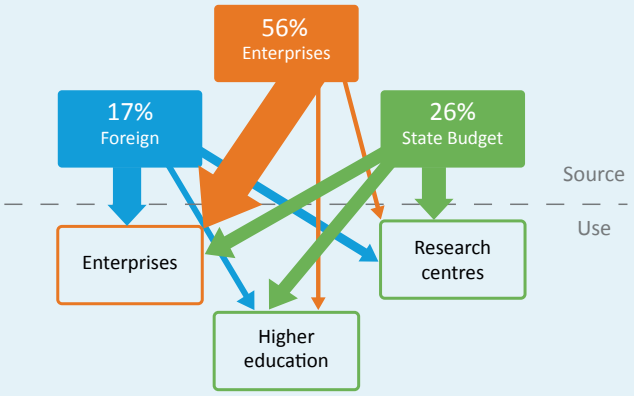
It would be important to primarily support projects that **may have feed-through effects**, thus increasing the efficiency of public R&D expenditures that serve corporate purposes. If the R&D subsidies are utilised only within the walls of firms, the already deepening gap between **public research institutions and companies** may continue to grow. If companies do not spend resources on joint activities with state-financed institutions, the market knowledge of institutions maintained by the government is lost and thus less will be reinvested in education, for example.

Chart 6-11: Business expenditures on R&D compared to state subsidies (2013)



Source: OECD.

Chart 6-12: R&D expenditures by sources and users of funding, stylised chart (2016)



Note: The thickness of the lines shows the stylised ratio of funds.
Source: MNB, based on HCSO.

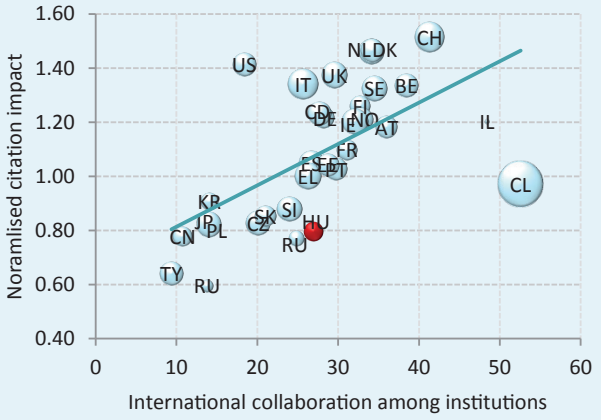
If that happens, the efficiency of public funds spent on institutions maintained by the state declines. **If companies do not cooperate with research institutions, they miss out on relatively affordable R&D opportunities, reducing corporate productivity.** In the current support system, there are examples for remedying both issues raised, but **further measures may be needed to increase interactions between companies and public institutions, allowing for an improvement in the balance of R&D financing**.

According to our expectations, if the financing structure becomes more balanced, it may significantly contribute to increasing productivity. **An increase in the flow of corporate expenditures to research institutions in higher education and scientific research organisations could result in more balanced financing** (Chart 6-12).

Cooperation between companies and higher education institutions may have a number of positive effects, e.g. through **an expansion in the supply of courses, which may help to reduce the emigration of highly productive labour.**

In the future, R&D policy should strive to **create advantages from networking**, to support the strengthening and widening of research networks. Large research networks may contribute to the acknowledgement of Hungarian research on the European stage as well. Considering that, by definition, research and development must target the cutting edge, participation in **international research** should be a key aspect in R&D policy (Chart 6-13).

Chart 6-13: Relationship between the impact factor of scientific references and inter-institutional international cooperation (2013)



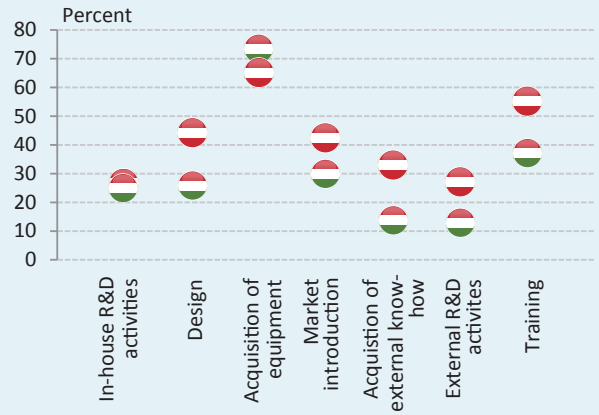
Note: The size of the bubbles is the number of the impact factor adjusted for the number of researchers. Source: OECD.

6.3.1.2 Innovation

Innovation is also born by utilising results from research and development processes. In terms of processes within a company, in line with international practice, a distinction is made between four types of innovation (OECD, 2005): **organisational innovation, marketing innovation, product innovation and process innovation**. It is worth breaking down these four innovation categories into 'core innovation' and non-core categories. Product and/or process innovation activities are considered core innovation categories or hard innovation processes, while non-core items include the innovation categories that are rather 'soft' in terms of their nature, but no less important, such as organisational and marketing developments.

Hungarian SMEs are considered low innovators in European comparison. It is typical that in Hungary only one out of five SMEs innovates, while to the west of Hungary every second SME carries out innovation.[107] Accordingly, the Hungarian SME sector's ability and willingness to innovate is clearly low. In the following, we analyse the **core innovation** activities (process and products innovations), which better capture the innovation ability. Chart 6-14 shows that the Hungarian SME sector lags behind Austria in various areas, although at the same time this lag is also typical of the V4 region as a whole.

Chart 6-14: Proportions of SMEs conducting core innovation activities (2014)

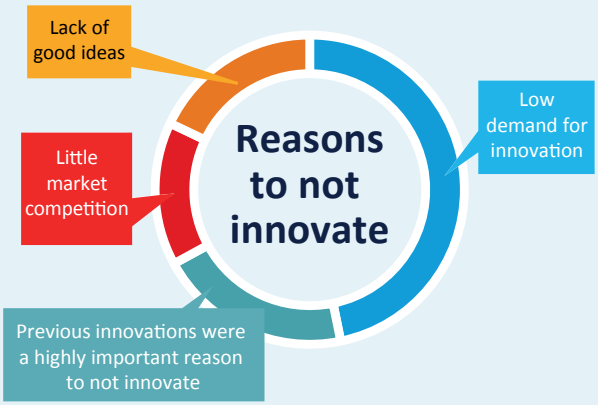


Note: Percentage values. Companies with more than 10 employees participated in the survey.
Source: Eurostat CIS survey 2014.

There are various explanations for the lag of Hungarian SMEs, but undoubtedly the most important area that needs to be developed is **entrepreneurial culture.** A good example is that according to a Eurostat survey **only 10 percent of companies that do not innovate feel that they should innovate**. In an international comparison, the Hungarian ratio is not extremely low, and Hungarian companies also indicate low demand for innovative products as the main reason for the lag in innovation (Chart 6-15).

The responses mention the lack of a suitable target market, confirming that companies' innovation capacity can be increased significantly by creating a stable innovation demand system. Accordingly, it is worth for the state to strive to introduce innovative state demand instruments, which are actively used in a number of places in Western Europe and create demand for innovative solutions.[108] At the same time, this response may also be interpreted in a way that while the idea typically exists, and competition is also strong enough to make companies innovate, at the end of the process they cannot adequately position their idea.

Chart 6-15: Answers of SMEs indicating the underlying reasons for the non-performance of innovation in the survey period in Hungary (2014)

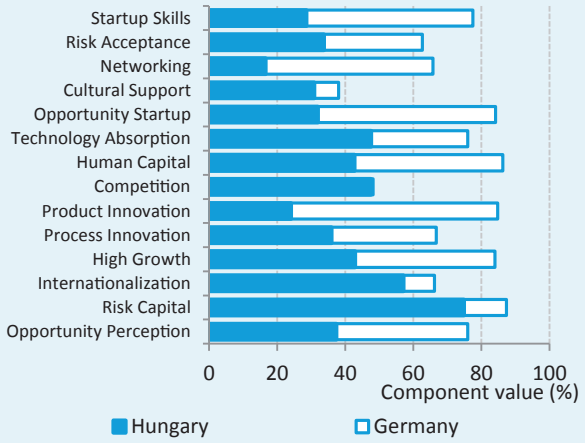


Source: Community Innovation Survey (CIS) 2014.

Another survey, the Global Entrepreneurship Index (GEI) also corroborates the shortcomings in entrepreneurial attitude. **Realisation of opportunities, risk taking, cultural support, the use of technology and the subindices measuring market competition are areas where the performance of Hungarian companies is quite poor** (Chart 6-16).

[107] According to preliminary data for 2016, 20 percent improvement was achieved in both categories at aggregate level.
[108] Means like this include pre-commercial procurement, the essence of which is that it shares the development risks between developers and the state, while continuous improvement of the solutions is ensured as a result of the tendering framework.

Chart 6-16: Dimensions of Hungary's entrepreneurial attitude (2018)

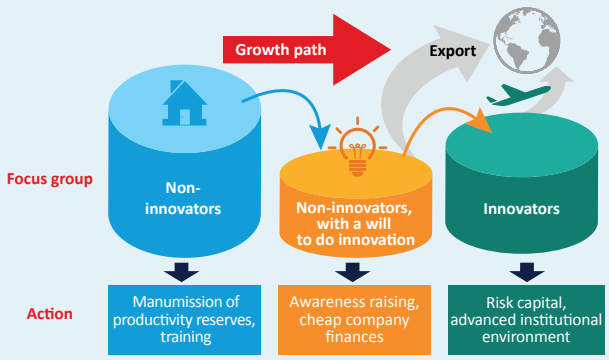


Source: Global Entrepreneurship Index 2018.

Stemming from their size, SMEs may be able to jump the stairs of entrepreneurial innovation if policy actively stimulates them to develop. Resources from the structural funds, central EU funds (e.g. Horizon 2020) and funds from the Hungarian budget currently play this role in an active manner. **However, another approach is also needed for the development of entrepreneurial knowledge.** Entrepreneurial **attitude-forming and information will be of key importance**, as enterprises often live 'closed' in their own world, without actively looking for the latest technological possibilities. Demonstrative sample programmes, such as Industry 4.0, which is supported by the government as well, may help to increase the willingness to innovate.

Accordingly, on the whole, it is seen that the Hungarian small and medium-sized enterprises can be divided into three groups in terms of innovation activity: **a group that performs core innovation activities (21%), a group that would innovate, but cannot for some reason (8%) and a majority group, in which most of the companies do not even see any reason for innovation (71%)**. Due to the varied attitude of SMEs towards innovation, **a differentiated approach is proposed** (Chart 6-17).

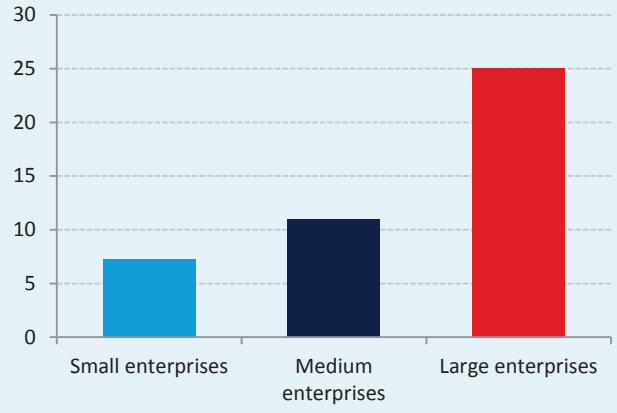
Chart 6-17: Theoretical framework of differentiated enterprise development



Source: MNB.

The largest group, the **enterprises left out from innovation (71%)**, typically operate in segments, environment and with labour that are not innovative. **Above all, freeing up the already mentioned productivity reserves may help to increase the activity of non-innovative companies. In addition to what is described in this chapter, a change in attitude may also be facilitated by raising the number of corporate training courses, which is also sensible in light of the challenges caused by technology and digitalisation.** In total, 11 percent of the employees of Hungarian small enterprises and 14 percent of the employees of medium-size enterprises attend further training, while the corresponding ratio is much higher (28 percent) in the case of large corporations (Chart 6-18). EU funds to strengthen corporate training courses are already available in an amount of some HUF 93 billion; proper utilisation of these funds is a key issue in terms of productivity.

Chart 6-18: Ratio of participants in professional training



Source: Eurostat.

In the case of **companies that do not innovate, but at least intend to (8%)**, the reasons hindering innovation need to be analysed. According to the respondents, the lack of state (or EU) support and the lack of internal funding resources can be mentioned as elements that are obstacles to innovation.[109] One important contradiction is also revealed here, which once again highlights the psychological barriers. **Companies justify the fact that they do not spend on innovation with internal financing problems, while innovation is exactly what would allow them to have more internal resources.**

In the case of **companies carrying out core innovation activities (21%)**, careful development of the ecosystem may be expedient. In this field, those economies proved to be successful that supported the reduction of the tax burdens on start-ups and innovative enterprises, supported flexible labour market policy, made incubator and early financing funds available and introduced bankruptcy policies that support restarting (Andrews et al., 2018). In addition, there is **ample room to increase foreign trading activity in the case of this group**, as primarily the companies that have innovative products or services may be considered potential exporters.

6.3.2 FOREIGN TRADE AS AN INCENTIVE TO INNOVATE

Devoting a separate subchapter to foreign trade is justified by various elements. Firstly, entering foreign markets and joining international production chains represent important breakout points for SMEs. In the case of Hungarian SMEs, a major lag is identified in the field of export activities. Secondly, **a number of studies highlighted the fact that participation in external trade entails higher corporate employment, labour productivity and total factor productivity; exporting** and importing enterprises are more competitive both in the external and domestic markets (Bernard and Jensen, 1999; de Loecker, 2007; van Biesebroeck, 2003).

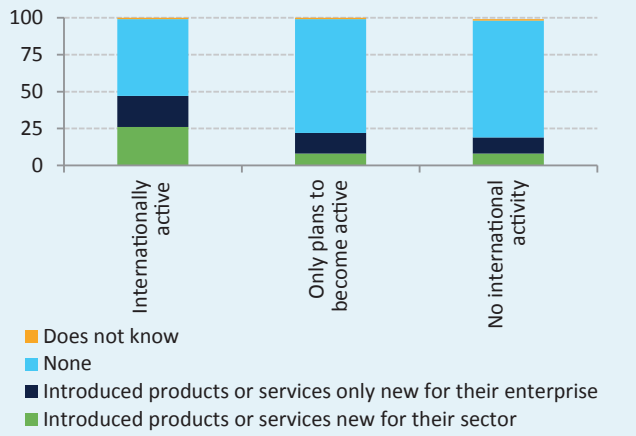
In our 2017 Growth Report, we examined Hungarian SMEs' participation in exports and the ensuing advantages. According to our main conclusions, few SMEs export and they typically export products with low value added and less knowledge-intensive services, but compared to non-exporting SMEs the companies that enter foreign markets grow significantly both prior to and following the exporting (Chapter 2, Growth Report 2017).

With the development in information technology, it has become possible to bridge long distances between trading partners, which makes entering foreign markets more affordable not only for large corporations but for SMEs as well. The organisation of production into cross-border chains also supports the more intensive presence of SMEs in export markets: intermediate products account for a large part of global exports, allowing SMEs to become suppliers to large corporations even if their product is very specialised (WTO, 2016). With the spread of global production chains, services supporting industrial production – such as logistics, transportation, repair and other business services – have also become increasingly wide-spread. Since services are less capital intensive, their exports are also favourable for SMEs. The weight of services in external trade increases dynamically due to the spread of information and communication technology, and in the near future SMEs may play an important role in services exports as well, which usually represent higher value added than goods exports.

In general, entering external markets requires further development of the corporate product portfolio. According to an EU-wide questionnaire survey of the SME sector, **companies that plan to participate in foreign trade in the future and ones already engaged in external trade are more innovative than firms that do not participate in foreign trade** (Chart 6-19). Compared to non-trading enterprises, a larger ratio of the SMEs planning to enter foreign markets in the future have introduced new products or services compared to their own portfolio. **Almost half of the enterprises already pursuing external trade produced new products or services.** The portfolio of these enterprises contains new goods/services compared to their own products and own industry roughly half-and-half. The latter assumes solid innovation activity and according to the comparison, this is the factor the existence of which divides exporting and non-exporting SMEs the most.

[109] It is important to note here that the year of the survey is 2014, and since then the external financing constraints of companies have eased considerably in a number of respects.

Chart 6-19: Exporting and introduction of new products

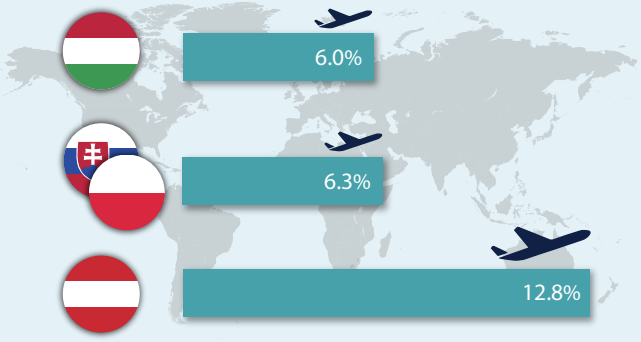


Source: Based on Internationalisation of European SMEs Survey, 2009, European Commission, p. 48.

Accordingly, we think that **it is necessary to involve as many SMEs in exports as possible**, which contributes to corporate and aggregate productivity growth over the medium and long term.

By way of comparison, although in Austria the ratio of exporting SMEs declined slightly, according to the latest available data **the ratio of Hungarian exporting SMEs is half of the ratio of Austrian exporters** (Chart 6-20).

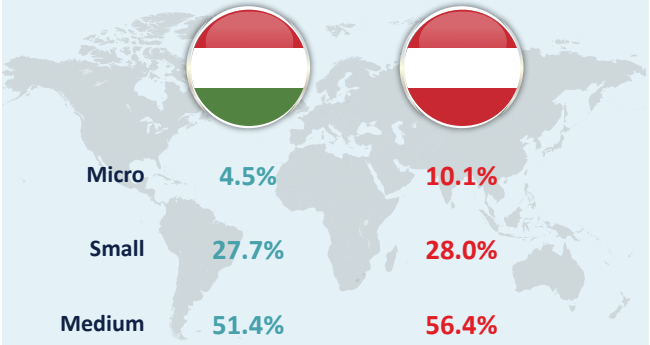
Chart 6-20: Ratio of exporting companies



Note: In the region, export-related data are available for Poland and Slovakia.
Source: Eurostat, 2015.

Lower willingness to export of Hungarian SMEs is **mainly observed in the case of micro enterprises**, although compared to Austria it can be identified in all size categories. Regarding Hungarian SMEs, the ratio of exporters is the highest among medium-sized enterprises.

Chart 6-21: Breakdown of exporting SMEs by size category



Source: Eurostat, 2015.

6.3.2.1 SME exports and aggregate productivity

Roughly 10,000 more Hungarian SMEs should export in order to converge to the number of exporting Austrian SMEs, taking 2015 data into account (Chart 6-21). At present, exporting SMEs mainly export goods (80 percent), while fewer of them export services (13 percent) and even fewer of them export goods and services (7 percent). Taking these ratios into consideration, **6,800 goods exporting, 2,600 services exporting and 600 new goods and services exporting SMEs would be needed in Hungary**.

The labour productivity of a goods exporting SME in Hungary is nearly twice as high as that of a non-exporter, while a services exporter is more than three times more productive and a goods and services exporter is nearly three times more productive than a non-exporting SME. Taking into account the current differences in productivity, newly entering exporters **would, *ceteris paribus*, result in a 40% productivity increase in the SME sector.**

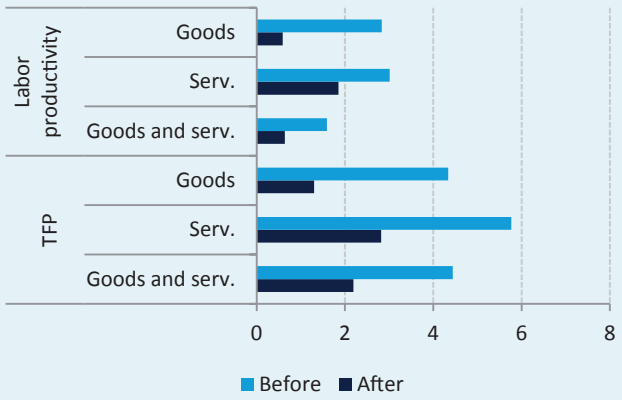
6.3.2.2 Exporting and other corporate characteristics

The performance of goods exporting companies exceeds that of non-exporting ones in several performance indicators: they are larger, their investment is higher, they have more capital and they are more productive. According to studies examining companies in several countries, services exporters are even better than goods exporters. **However, the listed corporate characteristics may influence the foreign market entry of enterprises from the outset, as enterprises that are already successful are more likely to**

decide to enter foreign markets. On the other hand, foreign market entry may help enterprises develop further and as a result of exporting, their investment, capital and productivity may increase further.

According to our estimate prepared using company-level data, before entering the export market, the labour productivity of a goods or services exporter is roughly 3 percent higher than that of a non-exporting SME, while the labour productivity of an SME that exports both goods and services is nearly 2 percent higher than that of a non-exporting one (Chart 6-22). Following exporting, SMEs further increase their productivity, most strongly amongst exporters of services. The increase in SMEs' total factor productivity is even more significant both prior to and following exporting.

Chart 6-22: Changes in corporate characteristics in the periods prior to and following exporting (percentage difference compared to non-exporting SMEs)



Note: The columns show the difference in the performance of exporting enterprises compared to non-exporters in the five years before and after exporting, projected on one year. For the purpose of estimating the differences, we took into consideration the enterprise's industry classification, the year and the historic characteristics of the enterprise. All differences are significant at a 1 percent significance level.
Source: MNB calculations based on NTCA and HCSO data.

Aggregate headcount and investment are expected to expand considerably with the entry of the ten thousand new SMEs to the external market.

Due to the new exporting SMEs, prior to their entering the market, on an aggregate basis the number of employees increases by more than 6 percent and investment grows by more than 10 percent (Chart 6-23). Following exporting, employment and investment expand by 3.75 percent and more than 4 percent, respectively. Assuming that all other factors remain unchanged, the aggregate increase in headcount and investment was calculated using the estimated values and the number of new SMEs seen in the (previous) chart, taking account of the economic weight of the SME sector.

Chart 6-23: Aggregate expansion in headcount and investment due to ten thousand new exporting SMEs

Source: MNB calculations based on NTCA and HCSO data.

On the whole, **entering the export market is a breakout point for SMEs**. It would be important in the near future if an increasing number of SMEs exported, especially products of higher technological intensity or knowledge-intensive services. SMEs may primarily increase exports to regions near Hungary. Besides the convenient distance, regional trade – directed mainly towards Southeast Europe – is supported by the high growth potential as well as the low language barriers in the regions of the neighbouring countries where Hungarians live. In addition, there are opportunities for large corporations in regions where the population is growing dynamically (Asia, Africa) and where purchasing power is increasing significantly with the widening of the middle classes (for more details see Chapter 1). **Moreover, urbanisation is also accelerating in certain emerging countries**, which may provide additional opportunities for increasing the exports of Hungarian small and medium-sized enterprises as a result of the appearance of services in an increasingly global world. Prior to and also following the entry into the export market, **companies implement significant developments, and their strong productivity expansion contributes to the rise in aggregate productivity**.

6.4 Structure of the economy and value creation

In this subchapter, we examine the structure of the production side of the economy and draw the ensuing conclusions, mainly from the aspect of foreign direct investment. Of course, in this respect we disregard SMEs, and our conclusions are basically drawn on macro structural data.

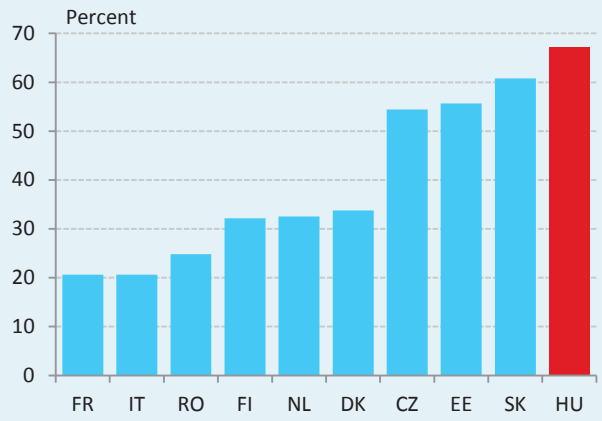
We identified two preconditions for the utilisation of FDI. The first is **the existence of absorption ability**. Balatoni and Pitz pointed out in their article that **human capital, physical and financial infrastructures, a predictable and stable macro environment as well as adequate institutions may significantly contribute to the exploitation of the potential advantages of foreign direct investment** (Balatoni – Pitz, 2012). These conditions strongly overlap the criteria presented in the discussion of the corporate ecosystem, which corroborates the primacy of the economic framework in the development of the economy. These elements are described in detail in other chapters of the Report.

Macrostructural conditions were identified as the second precondition. An issue that arises in connection with FDI is the steadily growing weight of manufacturing in the economy. In last year's Growth Report, we already pointed out that the usual consequence of the modernisation of the economy is that industry initially has a growing weight in the GDP, and then above a certain level of development its role declines gradually (Chapter 5, Growth Report 2017). Initially, the path of the weight of the industry, which is similar to an inverted U, results in an increase in income as a consequence of the expansion in productivity. Later, demand does not react in a sufficiently flexible manner to the price decline, and thus the weight of manufacturing starts to decline. **At present, the declining phase of the process is not seen in Hungary yet, as the share of (manufacturing) industry within GDP has not decreased.** In our opinion, it has direct consequences regarding productivity, and therefore we devote a separate part to the analysis of structural conditions.

6.4.1 STRUCTURAL CONDITIONS AND THEIR CONSEQUENCES

The functioning of FDI in Hungary may be considered successful if several segments can benefit from the presence of foreign companies. Structural data show that Hungary is not successful in this respect, **as in pro rata terms the domestic value added is the most dependent on the imports of foreign intermediate products** (Chart 6-24). On the production side of GDP, intermediate goods worth HUF 0.7 million are needed on average for the production of HUF 1 million. In addition, in the Hungarian economy, for producing HUF 100 of value added, imported products and services worth almost HUF 220 need to be used, while domestic companies receive orders amounting to only HUF 90. In the also highly industrialised Czech Republic, 100 units of value added require import orders amounting to 140 units, and the orders given to domestic companies amount to at least as much. **Accordingly, in the Czech Republic the domestic/import ratio is roughly fifty-fifty, while in Hungary this ratio is 30–70% in favour of ordering from abroad. Most of the import use for production purposes (75 percent) enters the economy through manufacturing.**

Chart 6-24: Import use for direct production purpose as a percentage of value added (2013)



Note: 'Direct' means that only the imports by production units are included in the calculation of production; accordingly, the import content of domestic inputs is not taken into account here.
Sources: Eurostat, MNB calculations.

If the main sectors of the economy produce with high import use, **an economy with low domestic value added creating ability will come into being.[110] High import use can have various negative consequences:**

1. when international supply channels are hindered or due to production change-overs, the probability of the occurrence of momentary or even final **production stoppages** is high;

2. if the labour market policy is successful, and thus companies are able to produce more, **the second-round beneficiaries of the measures are foreign suppliers and not domestic ones;**[111]

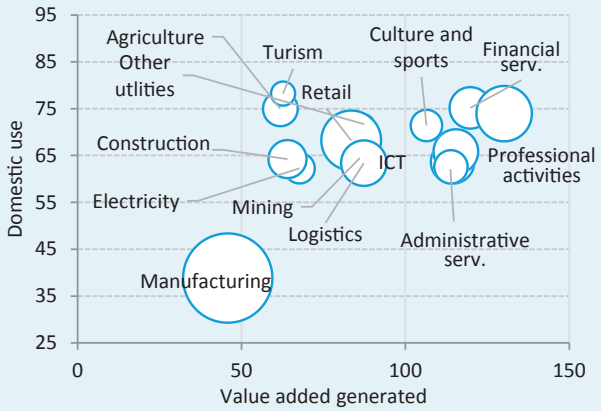
3. production does not use or only hardly uses location-specific resources and therefore it is very easy to **relocate**[112] such activities.

Another question is how **general the phenomenon of high import use in production is.** Is high import use true for certain sectors, such as manufacturing, or for larger groups of

[110] It needs to be noted here that high import intensity, although not its degree, is a natural concomitant of a small-size economy.
[111] Through the policies aiming at the increasing of employment and employability.
[112] Moving on beyond the border of the country or moving back to the sending country.

sectors or is it a general phenomenon? This question cannot be answered accurately with the help of descriptive statistics. The underlying reason is that import use may appear in production indirectly as well. These linkages can be observed by sector through the symmetric IO table of Hungary called the Balance of Intersectoral Relations (ÁKM) prepared by the HCSO. In addition to quantifying the indirect effects, efficiency also needs to be taken into account. Efficiency is shown by the share of value added within output. Low (or high) value added creating ability often stems from the peculiarities of the sector. Of course, a manufacturing subsector such as vehicle production, uses more basic materials and services than the IT sector. At the same time, it is also obvious that **when the production of an industry, which uses a high amount of imports, is dynamic** compared to other sectors (for example as a result of an increase in external demand or due to government support), **domestic players receive fewer orders compared to the case when the same dynamic demand emerges in a multiplicative sector** (e.g. IT sectors). With these two index numbers and knowing the domestic terms of trade of the ÁKM, the multiplicative characteristics of the individual sectors of the national economy can be calculated (Chart 6-25).

Chart 6-25: Internal value added creating ability by sector (2013)

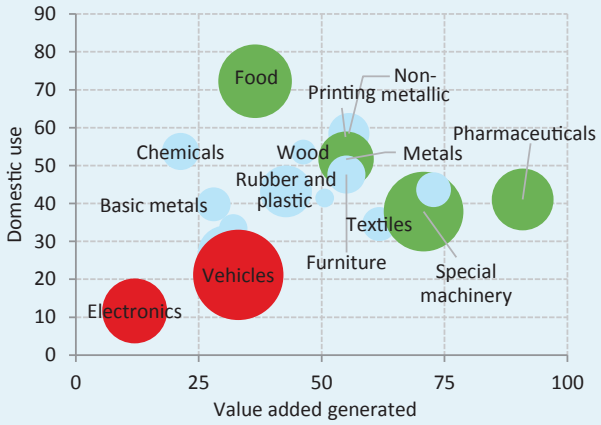


Note: Calculated from the 2010 symmetrical matrices. The values of the two axes are responses to 100 units of shock. The size of the circles shows the share of sectors within value added.
Sources: HCSO, MNB calculations.

Based on our simulation, as a result of its high import ratio and low efficiency, the isolation of FDI-intensive manufacturing, which was the biggest beneficiary in terms of government support in past decades, is significant.[113] **By contrast, supporting knowledge-intensive services subsectors may simultaneously increase the ratio of domestic orders in production, and may add to productivity as well.**

It is also worth differentiating within manufacturing. With the method applied in the case of Chart 6-25 it is possible to calculate that **one unit of growth in the output of the electronics and vehicle industries, which are otherwise considered technology intensive, hardly entails any feed-through effects for the economy** (vertical axis, Chart 6-26), and due to that and the high import use, **the value added produced here is insignificant** (horizontal axis). By contrast, there are also manufacturing subsectors whose domestic multiplier effect is significant (e.g. food industry) or value added multiplier is high (pharmaceutical industry, special machinery, textile industry).

Chart 6-26: Internal value added creating ability in manufacturing (2013)

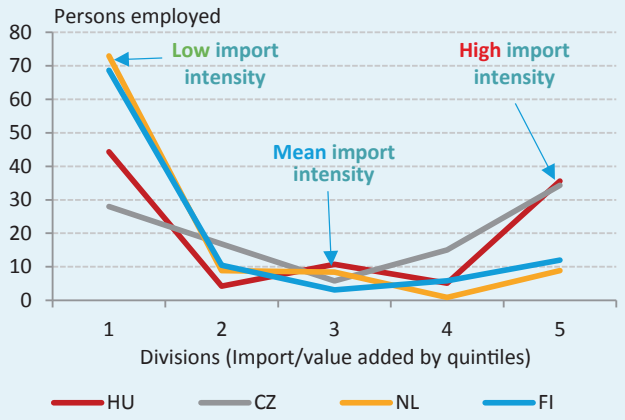


Note: Calculated from the 2010 symmetrical matrices. The values of the two axes are responses to 100 units of shock. The size of the circles shows the share of sectors within value added.
Sources: HCSO, MNB calculations.

Questions related to the focal points of the structure of the economy have also become especially timely, as the narrowing of labour market capacities in the recent years has revealed that labour supply is limited, and its allocation to multiplier sectors is a key issue. The ratio of employees in sectors with high import demand is much higher in Hungary than in Finland or the Netherlands, which are considered productive knowledge-based economies (Chart 6-27). **This structural property impairs Hungary's productivity potential.**

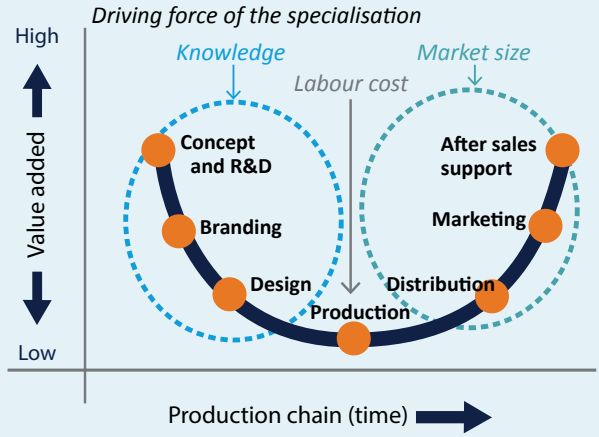
[113] The majority of special benefits provided by the Government are related to manufacturing companies. In 2017, 92 percent of the development tax allowances were drawn by manufacturing companies, which were large corporations almost without exception.

Chart 6-27: Distribution of employment by sector on the basis of import intensity (2014)



Note: The mean value is the +/- 10 percent deviation from the European average.
Source: MNB, based on Eurostat.

Chart 6-28: Correlation between the value added of industrial production and the work phases elapsed since the beginning of production (smile curve)



Sources: Shih (1996), and MNB regarding specialisation.

This insight has not been newly realised in management literature either, as higher-productivity work phases have already been identified in the long-known connection that has become famous as the 'smile curve' (Shih, 1996) (Chart 6-28). In this model, which was originally adapted to IT manufacturing, **manufacturing represents the lowest value added**. At the beginning of the production chain, phases preceding marketisation are typical in knowledge-based economies, but most of the FDI in Hungary cannot be classified into this category. **Typically, the FDI that settled in Hungary outsourced production to Hungary and kept the activities with higher value added in the parent country.**[114] **However, this is not the final state: technological challenges tend to direct market demands towards small companies that react more efficiently, and in this respect innovative Hungarian SMEs and research centres may also have chances** (see below).

The question then arises as to whether the beginning or the end of the production chain can be better adapted in Hungary. It is more difficult to join the activities at the end of the production chain because in the case of these activities the importance of localised knowledge is already strong, which is clearly the advantage of larger markets.[115] By contrast, **the advantage of specialising at the beginning of the production chain is that from here – theoretically – many spillover effects can evolve**, and new firms may develop as a result of the knowledge obtained from the multinational companies. The role of spillovers is extremely important in convergence. According to the unanimous opinion in the international literature, **the creation of knowledge spillover is an indispensable condition of breaking free from the middle-income growth trap**. Therefore, in the case of countries that are technologically dependent in most areas, it is necessary to make **the transfer of technology easier and to develop the absorption ability of enterprises.** The problem is that due to horizontal-type FDI, at many foreign-owned companies located in Hungary the majority of employees are semi-skilled labourers performing more simple work, and in the past years this ratio increased even further.[116] Considering that knowledge spillover typically originates from white collar workers, **spillover effects cannot be sufficiently effective in Hungary**.[117]

[114] According to Q1 data of the HCSO's Labour Force Survey 2018, the ratio of employees belonging to the management category (ISCO 1 main group) within manufacturing was 2.5 percent at foreign-owned companies and 4.3 percent at Hungarian-owned firms.
[115] It needs to be noted here that in the area of product support there are significant opportunities to join the administrative processes through SSC and BSC type service centres. At the same time the number of spillover possibilities from this area is very low.
[116] Based on the data of the HCSO Labour Force Survey.
[117] A high ratio of brain workers alone does not guarantee that the spillover really takes place. In practice, little spillover can come into being from the employees leaving multinational companies' systems that are optimised for partial tasks. Following the political transformation, for lack of available foreign alternative, the Hungarian Government, and typically the other Central European governments, supported the settlement of partial tasks (Landesmann, Stölinger (2018)). As a result, the V4 governments have relatively little leeway in terms of industrial policy.

FDI may easily decide to move on or move back at any time. Accordingly, the FDI settled here should be made interested in long-term planning, and this should be done by relying upon the local, specific human and business capacities, not only because of the favourable tax conditions. Appropriate, concentrated policy intervention to engage FDI for the long term is also crucially important in terms of the **current account balance.**

6.4.2 CHALLENGES FACED BY HUNGARIAN INDUSTRIAL POLICY

Above we showed how the negative correlation between internal value added creating ability and the use of imports in production has adverse effects on the economy in the long run. In the following, we discuss the possible government solutions to this problem and the challenges to planning industrial policy.

The primary objective of development policy is to bridge the development gap and lay the foundation for sustainable development. **Supportive economic policy already plays a key role in the Hungarian economy: every year, 1.5–2 percent of Hungarian GDP is spent in the form of subsidies, which have been higher than the European average for years.** The significant role of the state itself justifies the need for the careful planning of an appropriate development policy; therefore, we need to return to industrial policy theories.

There are two main types of industrial policy. **Vertical industrial policy typically means a policy focusing on key sectors.** This approach clearly carries the risk that currently existing, unhealthy structures remain unchanged (Felipe, 2017). **The horizontal approach, which is the other main type of industrial policies, supports development with inputs that can be used by various sectors.** They typically include infrastructure, health care, education and security. **The use of both approaches together is typical in the practice of modern industrial policies.** The underlying reason for this is that although the horizontal approach has become prevailing in western-type economies, usually stemming from their historical heritage or the special importance of a certain field, states treat some sectors in a preferential manner. **This mixed approach is also typical in Hungary through strategic documents and VIP Cash Grant as well as in an institutionalised form.**[118]

Stemming from their special needs, certain sectors, such as agriculture or tourism, will continue to receive preferential treatment, but at the same time **the sectoral focus needs to be changed in order to restore the internal value added creating ability. It can primarily be implemented if the policy focuses on facilitating the learning of advanced technologies instead of the focusing on certain sectors.** The replacement of the system of selecting key sectors is also justified by the fact that, due to networking and specialisation, individual companies operate not only in one well-identifiable sector, but rather are involved in various vertical and horizontal systems as well (e.g. clusters).

Due to their size and circumstances, small, open economies may obtain advantages in specialised markets with the help of industrial policy. Very often they are niche markets, of which a number of emerging sectors are in the field of modern services. **Policy should strive to identify those currently existing local capacities that fit the global trends. According to our analyses, there are Hungarian markets mainly in the areas covered by clusters, for example in the health industry**[119] **and the food industry**, but there are many positive Hungarian examples in other fields as well. These include **data technology**,[120] **intelligent transport systems**,[121] **developments related to the Internet of things**,[122] industrial **biomass** utilisation technologies and last, but not least the **research of artificial intelligence**.[123] **These fields have export potential as well, and thus it is necessary to make these firms visible for the institutions engaged in foreign economic promotion.**

[118] Since the political transformation, all Hungarian governments have provided special support to FDI in the vehicle and machine industries, which – as presented above – has low internal value creating ability.

[119] Outstanding research projects or research institutions exist in pharmaceutical production and the related industries as well (e.g. genomics), and also in food production. In pharmaceutical production, regional-level multinational companies have their headquarters in Hungary.

[120] The clients of Starschema, a Hungarian company in Budapest, include Facebook, Apple, Tesla, Netflix, Disney and the European Commission.

[121] Several specialised research centres were established in the field of autonomous transport (e.g. RECAR, MTA-SZTAKI), and there are training courses in the field of cognitive systems as well. The self-driving car test track in Zalaegerszeg, which is expected to be completed in 2020, is a unique investment in Europe, which may also facilitate knowledge accumulation in this field.

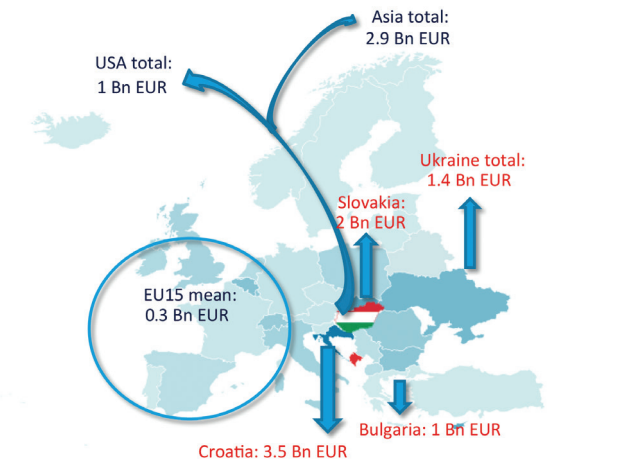
[122] The researchers of the University of Szeged won a grant of 810 million for their 'Internet of Living Things ' research, in which they hope to receive applied research results that will also be utilisable for the development of sensor networks that monitor field crops.

[123] At present, promising artificial intelligence research projects are going on independently or connected to product developments of other industries in several Hungarian institutions, including SZTAKI-ApertusVR, AImotive, Continental, Realeyes, Synetiq, Ultinous, ABSonic, Wallet Investor, etc.

6.5 Opportunities for Hungarian-owned large companies

One of the most important subjects of the past nearly 30 years in the history of the Hungarian economy was attracting FDI and the regional competition for FDI. Until now, Hungarian companies' investments abroad could not be in the focus of foreign economic policy due to the simple reason that there are not many Hungarian-controlled strategic companies that are also able to operate successfully in foreign markets. **At the same time, Hungarian large corporations' active investments abroad will also be necessary in the future to narrow the GDP–GNI gap as indicated in the macro path.** This is in the interest of not only the national economy, but it is also the well conceivable self-interest of companies.

Chart 6-29: FDI abroad, cumulative transactions since 2001



Note: Net of capital in transit and asset portfolio restructuring.
Source: MNB.

Large Hungarian companies that are currently active in investments in foreign markets prefer the countries in the region (Chart 6-29). **FDI outflows to the V4 countries and Hungary's neighbours since 2001 account for 40 percent of all investments abroad.**[124] There may be various reasons for this geographical concentration:

1. **geographical proximity**: company managers prefer the markets that are easy to reach personally as well, and this aspect may work in an inversely proportional manner to the size of the company;

2. **high growth potential**: as a result of the lower initial level of development, over the long run expansion in these markets will presumably exceed West European growth rates;

3. **lower language barriers**: where Hungarian minorities are present, Hungarian-speaking workforce is available, and in many cases one of the main European languages is spoken in the target country;

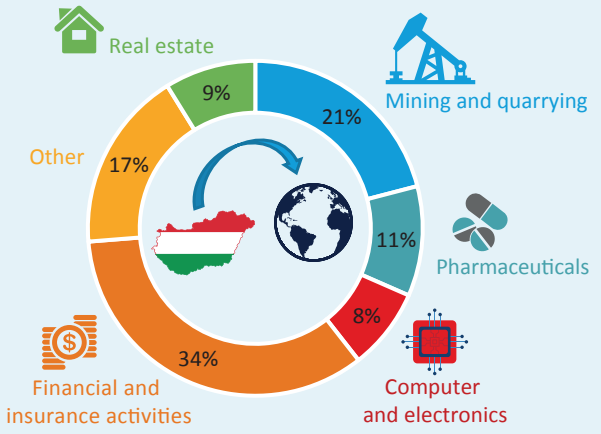
4. **relatively low prices**: compared to the more developed regions, the firms of the countries in the region (including the Balkan countries) can be acquired at a favourable price, also taking account of their market penetration;[125]

5. **political situation**: considering that many of the countries in the region are candidates for EU membership, Hungarian investments are welcome by other states.[126]

In light of all this, it is clear that the Central East European region will remain the scene for Hungarian FDI. Nevertheless, it is still likely that the weight of investments flowing to countries within the European Union will remain significant, which is also facilitated by a number of institutional factors (e.g. legal certainty, legal harmonisation, free flow of capital and labour, lower transaction costs). At present, however, only some companies that are considered important players at regional level as well are able to pursue this activity on a larger scale; without exception, they employ at least 10,000 people and are concentrated only in certain sectors (Chart 6-30).

[124] It is important to note here that we did not categorise the companies according to owners.
[125] 'We are primarily looking at the region where we see growth potential, but we are not going to enter a new market with low market share... It is very typical of the bank and myself as well that we have a conservative approach to all financial decisions, whether it is about risk management, provisioning or investment.' Sándor Csányi CEO of OTP Bank to Portfolio.hu (7 Nov 2017).
[126] The Prime Minister of Montenegro, Dusko Markovic, thanked Hungary for supporting Podgorica on its way to NATO integration and for helping with the accession to the European Union. 'The EU is a priority for us.' He also said that Hungarian investors are welcome in Montenegro. (Embassy of Hungary in Podgorica, 2018).

Chart 6-30: FDI abroad according to the sector targeted by the investment, cumulative transactions since 2008



Note: Net of capital in transit and asset portfolio restructuring.
Source: MNB.

Theoretically, however, opportunities to invest in foreign markets may be available for smaller companies as well. To the west of Hungary the **outsourcing of horizontal types of tasks** is already a long-time tradition. In this case, firms outsource partial tasks (e.g. accounting, payroll, technical support, customer service), which **can be operated in a much more economical manner in a country where wage costs are low** than close to the company headquarters. In regions where Hungarians live, the attainable wage differences range from 30 percent (Romania) to even 4-and-a-half fold (Ukraine). A further advantage of outsourcing compared to export contracts is that **the outsourcing of services is not subject to customs duties in the receiving countries**. **The wage costs saved as a result of the outsourcing may be spent at home on the increasing of capital intensity, which is reflected in the activities that have higher value added.** Outsourcing to territories where Hungarians live outside Hungary also serves the interest of the local people. **According to the latest data, the unemployment rate is 10 percent in Sub-Carpathia** (Ukrstat, 2016), **11 percent on average in Central and East Slovakia** (Eurostat, 2017), **10 percent in Vojvodina** (Opec Srbije, 2018), and thus **new jobs could also be created in these disadvantaged regions, which are often inhabited by Hungarians.**

It is also clear, however, that the smaller a company, the less able it will be to outsource activities on its own. **By undertaking an active role, the state** may help in this regard.

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7 Efficient state

The growth capacity of enterprises is significantly influenced by the environment in which they function. One of the most important elements of this environment is the state, which impacts competitiveness via several channels and thus also influences macroeconomic growth and convergence. Due to its size, the state uses significant resources. Empirical analyses confirm that there is strong positive correlation between efficient state administration and economic growth. By EU standards, the Hungarian state's spending on maintaining public administration is relatively high. The primary reason for this is the high level of public employment, while the wage per capita is unable to compete with the positions in the private sector. Under the present favourable labour market circumstances, it is easier to release public human resource capacities for the private sector, while the state may spend the budgetary saving thus realised, among others, for wage increases within the sector. E-governance is able to provide substantial support for the more economical functioning of state. Since productivity is higher in the private sector than in the public sector, the realignment of employment in this way alone supports growth in macroeconomic productivity. Decreasing bureaucratic burdens will tie up the resources of the private sector to a lesser degree, thereby improving the efficiency of enterprises.

On the regulatory side, the state may help curb the hidden economy, the excessive size of which generates competitive disadvantages for lawfully operating enterprises and also reduces budget revenues. Thus, government efficiency not only contributes to productivity growth, but also provides the countercyclical room for manoeuvre, which – based on the lessons learnt from the crisis – is necessary for the achievement of a balanced growth path. The reduction of tax evasion and the hidden economy supports competitiveness via several channels. Starting from 2010, in Hungary several economic policy measures (connection of online cash registers, introduction of the Electronic Public Road Trade Control System, launch of online invoicing) supported the reduction of the hidden economy, as a result of which the estimated rate of tax evasion declined to 22.2 percent, which, however, still exceeds the EU average (17.9 percent) by more than four percentage points and the Austrian level (7.8 percent) more than three times. With a view to further reducing the hidden economy, the continuation and expansion of the already commenced measures aimed at curbing the shadow economy would support the success of convergence.

One of the key roles of the state is to provide the private sector with the fundamental – or in other words, basic – infrastructures. These infrastructures have already been dealt with partially in the section on human capital (e.g. nursery capacity). The traditional infrastructures (road, railway, water transport, etc.) continue to be important for a country's competitiveness; additionally, in the 4th industrial revolution, telecommunications, and particularly the possibility of wireless data transmission, is also gaining importance. The development of infrastructure reduces transport costs, has investment generation capability and also contributes to convergence, via improved labour mobility. In Hungary, the density of the road and railway network is favourable in a European comparison, but in terms of quality these networks are obsolete. The implementation of fast, cheap transport and the strengthening of Hungary's international infrastructure interconnectedness may substantially increase the competitiveness of the Hungarian economy. The key resource of the 21st century may be the data, the fast transmission of which is a key measure of competitiveness. On the one hand, the extensive use of the broadband internet and the mobile 5G network fosters the digitalisation of the economy, which increases the efficiency and productivity of the service sector. On the other hand, in the households it facilitates the use of the new devices appearing in the 4th industrial revolution (e.g. household appliances communicating with each other), which may lead to an expansion of welfare. The spread of modern telecommunication solutions helps services gain importance in the Hungarian economy and contributes to economic growth. The functioning of the modern telecommunication infrastructure depends on a safe environment. Hungary's cybersecurity maturity lags behind that of Austria and the EU average.

By developing a proper energy mix and fostering energy efficiency, the state may reduce the country's energy dependency and contribute to maintaining the trade surplus. In Hungary, one unit of economic output consumes twice as much energy as in Austria; the reduction of this may be facilitated by accelerating the renovation of the Hungarian stock of dwellings and public buildings, the faster penetration of environmentally-friendly technologies in industrial production and rejuvenation of the vehicle fleet.

KEY INDICATOR	LATEST VALUE	TARGET VALUE FOR 2030	SOURCE
Number of hours spent on tax returns	277 hours (2017)	171 hours	Doing Business
Degree of hidden economy	22 percent (2016)	18 percent	Schneider
EU Digital Economy and Society Index	35 percent (2018)	55 percent	European Commission
Energy intensity	230 kg/EUR 1,000 (2016)	120 kg/EUR 1,000	Eurostat
Net energy imports	58 percent (2015)	Below 50 percent	World Bank

7.1 Public regulation and bureaucracy

7.1.1 RELATIONSHIP BETWEEN BUREAUCRACY AND GROWTH

The quality of public administration, via its effects controlling and influencing the economy, is a fundamental competitiveness factor. In order to ensure the efficient functioning of a country's society and economy and satisfy their needs, it is essential to maintain a proper public administration and bureaucracy. This is partially due to this fact that in the welfare economies the state is the largest employer. After World War II, in the developed countries the number of public administration employees dynamically rose; for example, in France the ratio of bureaucracy within the total number of people in employment doubled in the period 1955-1990. The rising trend broke in the mid-1980s in Europe. Despite the consolidation thereafter, the state continues to be one of the key employers in the economy (Rothenbacher, 1997).

Essentially, three criteria can be examined to assess the impact exerted by public administration on the economy. Firstly, the public administration headcount, which absorbs labour force in the economy and thus also affects private sector employment. Secondly, the cost of maintaining the public administration, which is obviously covered by the tax burdens imposed on the private sector. Thirdly, the quality of public administration, the efficiency and growth-friendly nature of regulation, which are much more difficult to quantify than the first two criteria. The efficiency of public administration can be enhanced by rationalising the activities, eliminating redundancies and strengthening digitalisation. This releases resources for the private sector and may also increase the budget's room for manoeuvre. The government may spend the fiscal saving thus realised on: 1) tax cuts; 2) financing productive public sector spending; 3) wage increase within the sector; and 4) reducing the deficit and debt.

The correlation between efficient public administration and economic growth is also supported by empirical analyses. Evans and Rauch (1999) identified an explicit positive correlation between public administration and economic growth, naming the Four Asian Tigers as one of the most important examples. The successful economic policy reforms in these Asian countries were built on centralisation; planning and coordination was performed by councils and committees, vested with even stronger competences than the ministries. Later analyses identified impacts varying by development level (Lovett, 2011). The quality of bureaucracy reflects higher variance among the lesser developed countries than in those with advanced economies, and thus a stronger growth effect can be identified in the first group.

In addition to the public administration headcount, as a quantitative factor, it is of key importance that the government should also satisfy the requirements of public administration based on the qualitative criteria. A public administration of adequate size alone is not a sufficient condition; it must have a highly qualified team of specialists, able to efficiently manage the tasks they are commissioned with.

The improvement of efficiency is complicated by the fact that value added cannot be measured in public administration in the same way as in the case of businesses. Statistics measure the public administration's value added primarily from the input side, due to the fact that output cannot be measured and it also has no market price. However, measurement of the state's efficiency has already commenced in certain countries and there are still plenty of opportunities in store. In this area, the United Kingdom has the greatest experience; the Office for National Statistics (ONS, 2018) gives an account of the public sector's efficiency annually in its report. The limitations of measuring efficiency at an aggregated level increase the role of individual and management responsibility.

High-quality public administration is conditional upon a wage level comparable with the private sector, which is hindered both by the fiscal barrier and the possibility of measuring performance. The condition of wage increases could be productivity similar to that in the private sector, which, however, cannot be measured due to the aforementioned limitations. Staff management is an approach frequently applied in bureaucracy, which yields no efficient result. The managers are interested in raising the headcount reporting to them and efficiency considerations are of secondary importance. A more modern and expedient approach is wage bill management: if fewer but more highly skilled officials are able to carry out the tasks, the saving realised on the headcount may be used for wage increases. This may help reward high performance and stimulates the staff to achieve it.

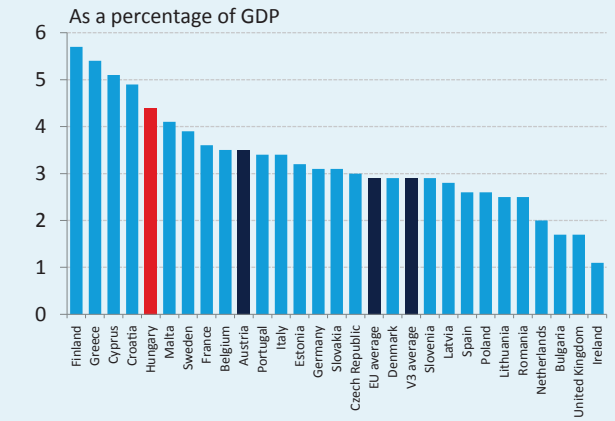
Competitiveness rankings reflect bureaucracy indirectly, occasionally with contradicting conclusions, due to the challenges inherent in the possibility of performance measurement. The institutions that compiled the key competitiveness surveys (World Bank, World Economic

Forum) did not undertake to measure the efficiency of public administration directly. The World Bank's Doing Business survey, which is based on objective indicators the most, places the emphasis on the state regulatory environment (e.g. starting a business, getting electricity, registering property), while the publication of the World Economic Forum focuses on the institutional system. Due to the methodological differences and the measurability obstacles, the conclusions also contradict to each other in certain cases. For example, based on the latest Doing Business survey, the regulatory environment is adequate in Hungary, while the World Economic Forum is of the opinion that the institutional system should be improved.

7.1.2 SIZE OF PUBLIC ADMINISTRATION IN HUNGARY

In an EU comparison, the Hungarian state spends relatively more on maintaining public administration, although some decline has been observed since 2014. One of the key items within government consumption expenditures is related to the maintenance of public administration. In Hungary, in the past roughly one decade the rate of public administration expenditures, adjusted for debt servicing transactions (among other things), fluctuated between 4.5 and 5.5 percent of GDP, with wages accounting for a major part of this. In the two years after 2014, expenditures as a percentage of GDP fell by 1 percentage point. Despite the improving trend, by international standards the Hungarian state still spends more on public administration than Austria and it also exceeds the average of the EU or the region. In Austria, the GDP-proportionate expenditure is 3.5 percent, while the average of both the EU and the Visegrád region was 2.9 percent, based on which fiscal saving of almost 1.5 percent of GDP would be feasible.

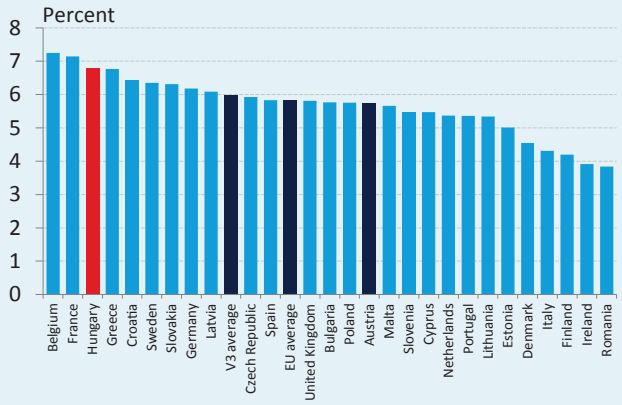
Chart 7-1: State public administration expenditures as a percentage of GDP (2016)



Source: Eurostat.

The large size, by international standards, of Hungarian bureaucracy is also evidenced by the headcount data. According to data from the Labour Force Survey (LFS), the number of public administration employees in Hungary is roughly 300,000. As a proportion of the total number of persons in employment, 6.8 percent work in public administration in Hungary, while the EU average is 5.8 percent and the Austrian average is 5.7 percent. Based on the international comparison, the size of the Hungarian bureaucracy could be reduced. Employment corresponding to the EU average would represent a bureaucracy smaller by 35,000–40,000 persons. Among other things, this may also serve as a catalyst to achieve the target – described in more detail in the Labour Market section – i.e. a higher employment ratio in the private sector.

Chart 7-2: Ratio of public administration employees (2017)

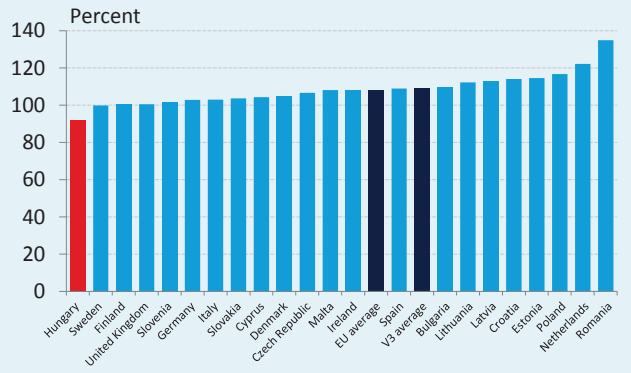


Source: Eurostat.

The shortfall in the wages of state administration employees compared to the average of the national economy is the highest in Hungary among the European countries. In parallel with the dynamic economic growth and the tightening labour market, in the past years Hungary was characterised by strong wage growth, from which the public administration benefited to a lesser degree. The budget's greater room for manoeuvre resulting from the potential downsizing of the bureaucracy may be a good opportunity for wage increases. A wage increase in the sector may raise the positive effects of public administration reforms, if in parallel with the rising wages the productivity of the more highly qualified public labour force also increases. In Hungary, in 2017 a public administration employee received 92 percent of the wage of an average employee, while the average of the EU member states was 108 percent. In the past years, the strong national economy wage growth was also accompanied by a wage alignment in public administration, but the high wage premium of the private sector remained. Starting from 2016, a wage increase was implemented in the government offices and at the tax

authority (NTCA) in several steps, but in other areas there has been no change in wages in quite a while.

Chart 7-3: Quotient of the annual wage of public administration workers and employees (2017)



Source: Eurostat.

Under the present favourable labour market circumstances, it is easier to release public workforce capacity for the private sector. Hungary has reached a stage of development, where the private sector's labour demand exceeds the labour supply with proper qualifications (at the current wage level). In the persistently tight labour market and with full employment, it is easier to foster conversion from the public sector to the private sector. A rise in the unemployment rate can be prevented by prudent implementation and by carrying out the necessary retraining. Increasing private sector employment and more optimal distribution of the resources supports both economic growth and fiscal balance.

By reviewing the regulatory framework, the state may materially decrease the burdens on the economy, which also supports the reduction in the size of bureaucracy. Economic agents adapt themselves to the laws stipulated by the state, but compliance with the law absorbs resources in the private sector, also curbing their economic activity. For example, according to the Doing Business survey, a Hungarian company spends far more time on activities related to taxation (VAT refund time, completing tax returns) than the EU average. The review and simplification of the laws frees up resources for the private sector and – in certain cases – it may also immediately reduce expenditures. On the other hand, the reversal of bureaucratisation entails less administrative work in the state administration as well, which may help to free up workforce capacities.

In line with the digitalisation of the economy, the wide spread of e-governance is essential to increase efficiency. In addition to reducing state regulation, another major development direction is the implementation of e-governance in as many as areas as possible. Administration may become not only faster but also cheaper, if the private sector initiates its official matters online or completes them fully online. On the whole, Hungary lags behind the EU member states in terms of e-administration, but there are some forward-looking initiatives. The e-personal income tax is one of them; e.g. in 2018, more than 3 million private individuals filed valid tax return without taking any significant measures.

Based on the international literature and the relevant indicators, it can be stated that reforming the Hungarian state administration opens up substantial growth and budget reserves. Efforts should be taken to create a public administration institutional system, which is able to discharge it duties in adequate quality, while it absorbs only the minimum human resources from the private economy. The spread of e-governance, the reduction of the state administration's duties at the regulatory level and the rationalisation of activities together will lead to a regime that is smaller in terms of headcount, but operates more efficiently. With prudent planning, the reduction of the size of state bureaucracy may be accompanied by an increase in private sector employment, which may serve as a catalyst for economic development.

7.2 Digital state

The development of ICT tools and services and the penetration of internet not only transforms the daily life of enterprises and communities, but also has a major impact on the operation of the state. Today, a large volume of literature confirms that there is a positive correlation between the penetration of digital services and e-administration and economic growth (Corsi, 2006). Gustova (2017) examined 34 European countries between 2003 and 2014, seeking connections between e-governance and economic growth. According to her paper, the improvement in the e-governance development index contributed to economic growth in the countries included in the survey. The demand for efficient, cheap and customer-friendly design of public administration, the simplification of the administrative processes and the reduction of the population's bureaucratic burdens pose great challenges for governments around the world. It is difficult to imagine that any public administration is capable of satisfying these requirements without the development of electronic services, and thus earlier public administration structures need to be overhauled. Fast, simple public administration is equally important for the efficiency of enterprises, the satisfaction of the population and the competitiveness of the national economy.

A properly functioning public administration reaches its objective, when it is transparent and cost-efficient for the enterprises, simple and customer-focused for households and generates no high operating costs for the state. From enterprises' perspective, the use of e-administration reduces the time spent on conducting official business, and they can use the extra time thus saved to focus on activities that better serve their profit-generating activity. By using digital services, paper-based administration declines and it is easier to retrieve electronically stored documents. Administration will no longer be dependent on fixed time and location, and thus the transactions to be conducted can be initiated from anywhere at any time, which accelerates and simplifies the processes. By reducing bureaucratic burdens, digital public services not only decrease costs and boost productivity, but also contribute to strengthening enterprises' IT grounding, and thus to the electronic development of their internal and external processes.

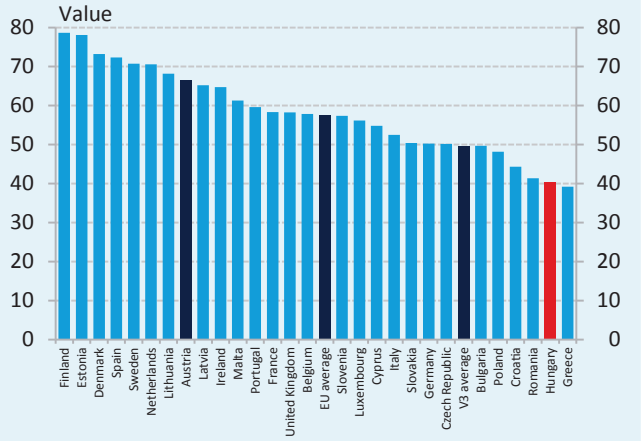
From households' perspective, efficient public administration strengthens the relation between the citizens and the state. If the population is satisfied with the operation of public administration, and feels that the state institutional system is customer-focused, a good relation of trust may develop between the two parties. This relation may also be supported by providing opportunities for expressing opinions in electronic form, thereby facilitating continuous feedback. The use of e-administration services improves the quality of life, since the decrease in the time spent on queuing and administration results in more time for leisure activities or fewer lost working hours. By saving travel costs, the incidental expenses of administration decrease (Palotai – Parragh, 2018).

From the state's perspective, the operation of e-administration facilitates the more efficient processing of public sector data, and the systems available through the internet lower the cost of collecting data and providing information to enterprises and households. In addition, it facilitates the achievement of economic objectives and reduces corruption by increasing transparency. Easier access to public data improves economic agents' opportunities to obtain information. The penetration of e-administration supports the decrease in bureaucracy, the automation of workflows and may also contribute to a decrease in the ratio of public employees. There are major labour reserves in public administration, the channelling of which to the private sector may ease the tight labour market and make the operation of the state cheaper. In the 21st century, in the knowledge- and innovation-based economic environment, countries that support their future by extending electronic public administration services, acquire competitive advantage.

7.2.1 SITUATION OF DIGITAL PUBLIC ADMINISTRATION IN HUNGARY

Based on the Digital Economic and Society Index prepared by the European Commission (EU-DESI), in terms of the digitalisation of public services, Hungary lags behind the EU member states. The digital public services pillar of EU-DESI, assesses the degree of public administration digitalisation based on six conditions: ratio of the users of e-government portals; volume of pre-filled data; volume of administration processes available online; digitalisation level of the administration necessary for company formation and conduct of business; accessibility of open data; development level of e-health systems.

Chart 7-4: EU Digital Economy and Society Index – Digital Public Services



Source: European Commission.

The development of e-administration has been in progress for several years, but at the time being only a limited number of official matters can be handled digitally in full. As regards the availability of pre-filled data, Hungary achieved a better result and is ranked 22nd among the EU member states, which was also supported by the government measures of recent years. The tax return, issued and pre-filled by the tax authority is available to all private individuals since the 2016 tax year. By launching the e-personal income tax system, 3.8 million private individuals had the opportunity to view, amend and approve the draft return through the new electronic system. However, on the corporate side administrative burdens are still high. In 2017, the average time spent by Hungarian companies on tax payment was 277 hours, while the EU average was 171 hours. The time spent on tax administration curbs the productivity of economic agents. In the future, the extension of the returns prepared by the tax authority to additional tax types (e.g. value added tax, corporate income tax) may reduce enterprises' bureaucratic burdens. The connection and

harmonisation of the data stored in the various databases is already in progress, the purpose of which is to accelerate the time of administration and reduce the time spent on filling in standard forms. The Austrian family support scheme without filing reports is a good example of the connection of the public institutions' databases, where the data from the Austrian population register are forwarded to the tax authority's system by automatic data supply. As a result of this, the Austrian tax authority automatically pays the family allowance to the families in respect of the newborn babies without any need to file documents with the tax authority.

The digitalisation of the administration necessary for company formation and conduct of business has gradually improved in recent years, but Hungary still lags behind the EU average and is ranked 23rd in this EU-DESI sub-index. The e-government company portal was launched on 1 January 2018, through which the enterprises can liaise with the offices and send and receive documents without personal presence, thereby making administration faster and more convenient. Six months after its launch, the e-government company portal was already used by 458,000 enterprises, which sent and received over 600,000 documents through the system. However, according to the World Bank's Doing Business survey, the operation of enterprises is overly complicated by a number of regulations. The efficient conduct of business is hindered by the complexity of and the time required for obtaining construction permits and accessing infrastructures (electricity). In Hungary, the issuance of construction permits takes 206 days, which exceeds the EU average (174 days) by more than one month. In the case of residential buildings, the authorisation process has already been simplified, but simplification would be equally important in the case of authorising commercial properties. Fast access to electricity and the reliable quality thereof are also essential for the efficient functioning of enterprises. According to the laws, the connection to the electricity networks in Hungary may take as long time as 257 days, which is two and a half times longer than the European Union average (96 days) and 11 times than in Austria (23 days).

In the access to open data sub-index of EU-DESI, Hungary has a substantial lag, as it is ranked 26th of the 28 EU member states. The source of open data may be the private sector and the public sector alike. Simple access to open data fosters the development of the public good. Governmental institutions are one of the largest and most important providers of public data and access to the information provided by them is equally important for the households, the private sector's organisations and the institutions performing public functions. The connection of the data stored in the various databases improves accessibility, and thus may facilitate convergence to the EU average.

In 2017, based on the EU-DESI survey, in the area of the maturity of the e-health systems Hungary was ranked 27th. However, from November 2017, the National eHealth Infrastructure (EESZT) was launched, which had to be joined by all health service providers financed from the central budget (hospitals, family doctors, pharmacies). The EESZT system, providing cloud-based services, may bring improvement in this area. The new system is patient-focused, may facilitate faster recovery, more efficient treatment and helps prevent unnecessary examinations. The information related to the patients, the data of the examinations, referrals and prescriptions are recorded in a central system, and thus – in possession of proper access rights – the health institutions can easily monitor the medicines taken by patients, and their previous illnesses and operations. The EESZT system accelerates medical treatment and patients do not have to take the old medical reports with them to the doctor. With the launch of e-prescription the administration became paperless, it became easier to track the collection of the drugs, which saves time both for patients and doctors.

On the whole, it can be stated that the operation of public administration may become more efficient by digitalising the processes and simplifying the regulations. The modernisation of public administration and the reduction of bureaucratic processes are already in progress. The paperless public administration may be implemented in full by 2021, which – according to the Minister of Finance – may save almost HUF 700 billion for enterprises.

Box 7-1: Estonia as an example of efficient state organisation

Successful economic convergence is based on the modern, coherent coordination of economic policy reforms, as well as on efficient state organisation. There is no uniform recipe for the coordination of economic reforms. Individual countries (regions) and periods required different reforms, and under the varying forms of state governance, different institutional systems proved to be adequate for this. While after the World War II the planning and coordination of economic reforms in the Asian countries were performed in a centralised manner, in Europe the elaboration and coordination of economic reforms were more characterised by decentralised organisation. With the appearance and penetration of the internet – from the second half of the 1990s – e-government solutions started to appear, which in addition to the more successful organisation of reforms, contribute to a more efficient state administration by reducing the administrative background and simplifying the possibilities of use.

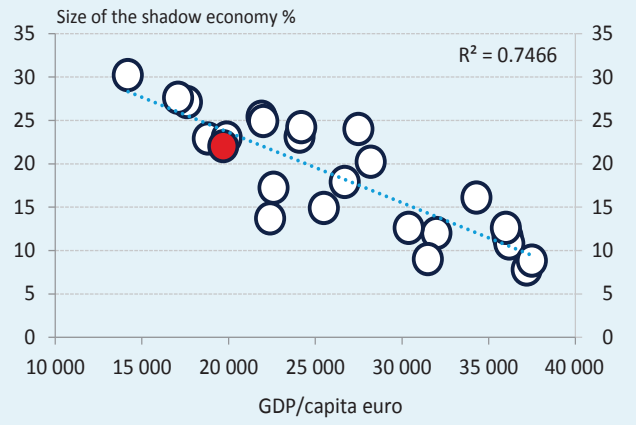
In Estonia, in the second half of the 1990s the government already recognised that the digitalisation of public administration would serve as the infrastructure basis for future economic growth. The development of e-governance commenced in 1997 and now provides households with several thousand of services online. Tax returns can be prepared in a matter of 3 minutes; since 2007 the population has the option to vote through the internet in the parliamentary elections; the health and educational systems are also fully digitalised. The electronic personal ID card – which includes the social security, residential address and tax cards – can be used for digital signature, as well as for public transport services. In 2007, the enhanced version of the ID card, integrated on a SIM card, was also developed, and thus all available services can be already accessed through mobile phone as well. The latest Estonian development is the provision of e-residency, which permits the use of the country's digital services from any point of the world also for persons without Estonian citizenship (Särav et al., 2016). The e-residency permits the online launch of a business by anyone, which may operate anywhere in the world. The company can be registered in one day without the personal presence of the start-up companies' managing directors; bank accounts can be also opened through e-identification and tax matters can be managed digitally, and thus the entire business may as well be managed remotely. However, e-residency grants no Estonian citizenship and the companies do not become resident in Estonia for tax purposes, and thus the enterprises will have to continue to pay tax in the country where they perform their actual activity.

The Estonian digital revolution is primarily about the creation of a customer-friendly state which provides services and supports growth, rather than about the technology. As a result of the digital developments, these days Estonian laws are also signed by digital signature and the government might as well be able to govern the country from the other half of the world (Heller, 2017). Electronic public administration developments support economic growth by reducing the administrative burdens of households and enterprises to a great degree. According to the estimates, the use of electronic signatures saves roughly the equivalent of 2 percent of GDP for the country, while the simple and fast administration became attractive for a large number of foreign companies (Economist, 2017). Estonia was also quick to recognise that no digital society can exist without people capable of understanding digitalisation and utilising the opportunities thereof, and thus education is key to the development of this area. Accordingly, already from the early school years pupils can learn programming in almost all Estonian educational institutions and all developments related to innovation enjoy support.

7.3 Reducing the hidden economy

Curbing tax evasion and the hidden economy supports competitiveness via several channels (Csomós – Kreiszné, 2015). An excessive hidden economy generates competitive disadvantages for lawfully operating enterprises, reduces budgetary revenues, as a result of which the tax burdens are concentrated to a larger degree on those pursuing registered activity and distorts economic statistics, thus complicating decision-making. Unregistered employment relationships jeopardise employees' social, legal and financial security. There is a strong correlation between the maturity of the economies and the degree of the hidden economy. Accordingly, measures taken to reduce the hidden economy may support economic growth.

Chart 7-5: Correlation between the degree of the hidden economy and economic maturity in the EU member states



Source: Schneider, Eurostat (2016).

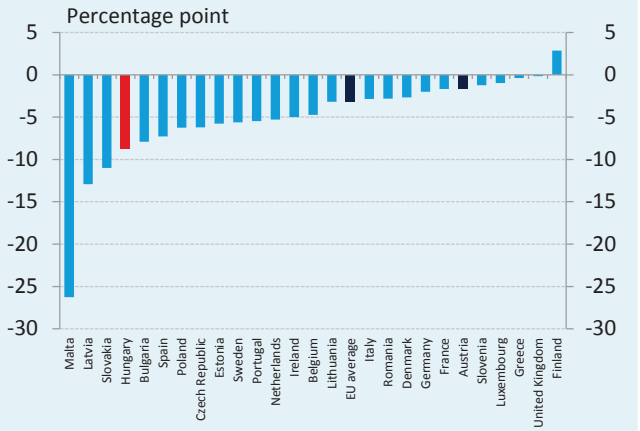
Tax evasion is influenced by a number of factors, such as tax burdens on the economy, the probability of discovering the tax evasion and getting caught, as well as the degree of the penalties, i.e. the efficiency of tax inspections, the assessment of the quality of services rendered by public institutions and the social norms of the micro environment, but it is also influenced by the perceived penetration of the hidden economy. Another important factor is the assessment of the state's efficient operation by taxpayers. This is because a low quality of public services reduces the anticipated usefulness generated by the paid taxes from the taxpayers' perspective, and thus they may increase the propensity for tax evasion. The increase in state regulation (e.g. tightening of labour market conditions) may divert taxpayers to the hidden economy by increasing the costs of operating in the formal sector compared to the hidden economy (Balog, 2014).

7.3.1 MEASURES TAKEN IN HUNGARY TO REDUCE THE HIDDEN ECONOMY AND THE IMPACTS OF SUCH

Starting from 2010, a number of economic policy measures in Hungary supported the reduction of the shadow economy and aimed at improving the "fairness" of the tax system. The online connection of cash registers to the tax authority (OPG) and the introduction of the Electronic Public Road Trade Control System (EKÁER) improved the efficiency of tax collection, contributed to reducing the degree of tax evasion and decreased the estimated ratio of uncollected VAT revenues (Palotai – Parragh, 2018).

The connection of online cash registers (OPG) commenced in September 2013 and now covers the entire retail sector. The operation of the OPGs substantially supports the tax authority's inspection activity and strengthens voluntary compliance with the laws. The positive impacts of the introduction of OPGs can be also clearly detected in the favourable developments in VAT revenues. This is well reflected by the change in the VAT gap, which in theory is the difference between the potentially collectible and de facto collected VAT tax revenue. In Hungary, between 2012 and 2016 the VAT gap declined by more than 8 percentage points to 13, which thus is already well below the average level of 20 percent, registered in the Visegrád region. Owing to the substantial decline in the VAT gap, by 2015 VAT revenues on an annual basis rose by roughly HUF 280 billion, without raising the VAT rates.

Chart 7-6: Cumulated change in the VAT gap (2012–2016)

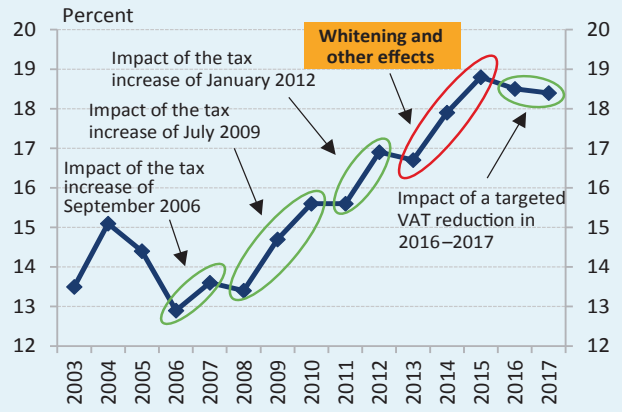


Source: European Commission.

The decrease in the degree of tax evasion is also evidenced by the growth in the effective VAT rate (ratio of the effective VAT revenue and the theoretical tax base) without increasing the tax rate. This ratio rose significantly between 2013 and 2015, despite the fact that the tax rate was constant

during that period. This process implies the broadening of the tax base, which is primarily attributable to the decrease in the hidden economy.

Chart 7-7: Changes in the effective VAT rate and the factors influencing it



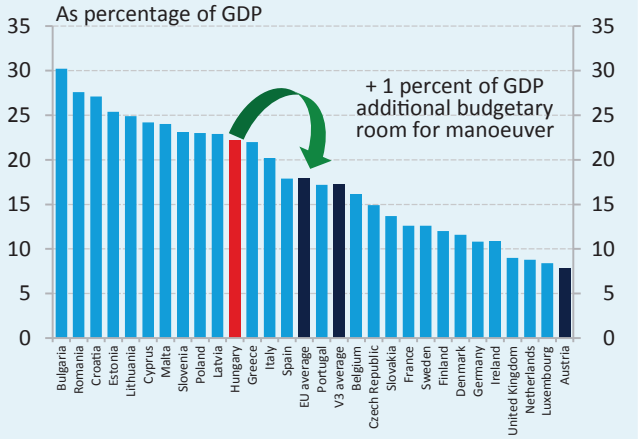
Source: MNB calculation.

Introduction of the Electronic Public Road Trade Control System commenced in 2015, the purpose of which – in addition to monitoring merchandise trade – was to prevent abuses related to health hazardous food, to identify tax evaders and to strengthen the position of lawfully operating economic agents. Through the EKÁER, the tax authority can track the effective route of the consignment, since the information related to the transportation is registered in a central system already before transportation.

From July 2018, the online reporting of electronic invoice data (online invoicing) was also launched in order to enable the tax authority to monitor transactions between the taxpayers remotely and take more efficient measures against VAT fraud. The online invoicing created for the tax authority an opportunity to conduct more efficient, automated inspections requiring less resources. On the other hand, as a return on the initial IT investments, enterprises can hope that the tax authority will less frequently burden them with inspections requiring the taxpayer's active participation, replaced by targeted, brief inspections. The online invoicing reduces enterprises' administrative burdens and creates the opportunity for the tax authority to assume the compilation of draft VAT returns in the future similar to those already applied in the area of personal income tax.

Introduction of the online cash registers and EKÁER helped reduce the shadow economy and substantially improved the budget position. As a result of the measures, between 2010 and 2016, the estimated degree of tax evasion decreased from 23.3 to 22.2 percent (Schneider, 2016).

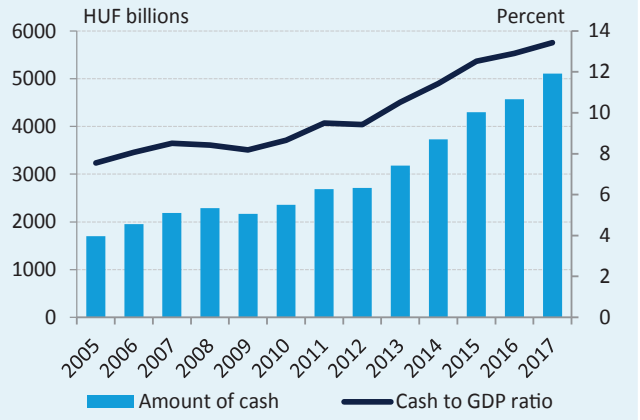
Chart 7-8: Estimated degree of hidden economy in the EU as a percent of GDP (2016)



Source: Schneider.

Room for manoeuvre for the budget equivalent to 1 percent of GDP would be generated if the degree of tax evasion in Hungary fell to the EU average, and the surplus revenue thus generated could be used for other productive expenditures or for the reduction of the budget deficit and debt. In Hungary, the degree of the hidden economy exceeds the EU average (17.9 percent) by more than four percentage points, while it is three times as high as the Austrian level of 7.8 percent. Curbing the hidden economy is complicated by the fact that in Hungary the cash holding as a percentage of GDP can be deemed high by international standards (Belházyné – Leszkó, 2016).

Chart 7-9: Changes in cash holdings as a percentage of GDP



Source: MNB

It is a general phenomenon that in countries with high cash holdings the degree of the hidden economy is also larger. The high cash holding facilitates the execution of transactions connected to the hidden economy (e.g. unregistered employment, failure to issue invoices). The reduction of cash transactions may be fostered by the wide-ranging development of electronic payment systems.

With a view to further reducing the hidden economy, the already commenced measures aimed at curbing the shadow economy should be continued and extended. In 2017, the range of sectors obliged to use online cash registers was expanded to include additional activities, such as vehicle repair and maintenance, retail trade of car parts, currency exchange, plastic surgery, taxi services, dry-cleaning, fitness and wellness services. From July 2018, with the launch of online invoicing, all company invoices with VAT content over HUF 100,000 must be reported online by the enterprises. In the future, the range of sectors obliged to use online cash registers and the EKÁER system may be further expanded.

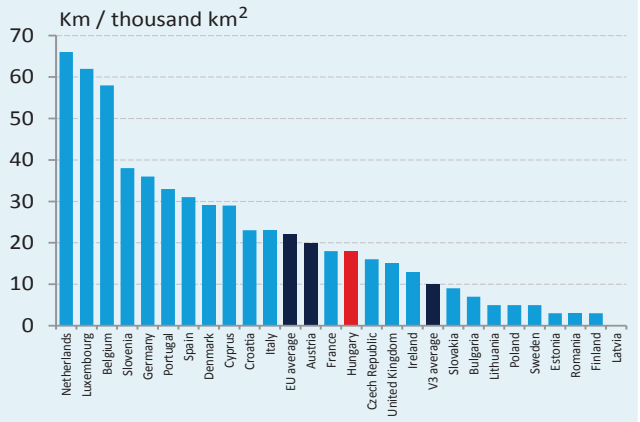
7.4 Infrastructure and modern energy management

A developed infrastructure, appropriate access to energy sources and the efficient utilisation of those are fundamental conditions for an economy's efficient operation. The existence of modern infrastructure is a fundamental condition for realising a modern and more productive economy, for which the maintenance and development of the transport networks developed during the first to third industrial revolutions (railway, road, air and water transport) is essential. At the same time, the utilisation of the opportunities of the fourth and the anticipated fifth industrial revolutions also require competitive digital and telecommunication networks. Modern energy management requires higher energy efficiency and greater energy independence.

7.4.1 TRADITIONAL INFRASTRUCTURE

The development of infrastructure may contribute to convergence by, among other things, decreasing transport costs, its investment generation capability and the improvement in labour mobility. As a result of the more dense and higher quality transport network, transport costs decrease and logistics opportunities improve. As a result of the better accessibility, the delivery of the goods to the destination becomes easier, which improves access to the market and strengthens price competition. The new and more advanced traffic routes may foster the implementation of green-field investments and thanks to shorter travel times they may contribute to an increase in labour mobility. The development of logistics facilities, stronger price competition and the rise in labour mobility improve the productivity of the economy. The enhancement of the telecommunication networks facilitates the mass use of new solutions appearing in the fourth industrial revolution, which leads to a rise in living standards.

Chart 7-10: Density of the motorway network (2016)



Source: Eurostat.

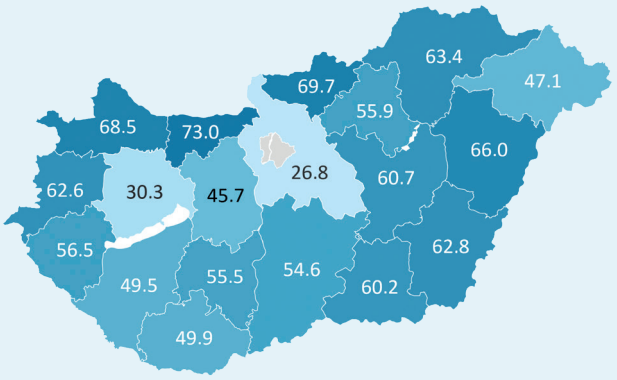
The density of the road network is favourable in a European comparison, but in terms of quality it is obsolete. The length of motorway per one thousand square kilometre is 18 kilometres in Hungary, which falls slightly short of the EU average and the Austrian figure, but substantially exceeds the V3 average (Chart 7-10). Despite the relatively large network, the M3 and M6 motorways do not yet reach the state border and the connection of the county seats to the motorway network is also incomplete. International transport is restrained by the fact that across the borders the continuation of not all of the Hungarian motorways have been yet completed. When examining the condition of the public roads, in two thirds of the counties more than half of the roads are in poor condition (Chart 7-11).

Similarly to the public road system, the railway network is also dense, but not modern. The length of railways per one thousand square kilometre is 84 kilometres, which exceeds the EU average by almost 30 km and the Austrian figure by 20 km. However, in terms of the ratio of electrified railways Hungary lags behind the EU and the regional average by 10 percentage points and approximately by 30 percentage points behind the Austrian level. There are no high-speed railways in Hungary; at present travel with a speed of 160 km/hour is possible only on certain parts of three railway routes. The north-south transport corridor – crossing the country – similar to that of the east-west one, is also missing.

Water transport is of lesser significance compared to railway and public roads, but the development of this mode of transport may also support growth. At present, about two thirds to three quarters of water freight traffic crossing

Hungary is connected to Hungarian economic agents, which falls short of the Austrian ratio by 5-10 percentage points.

Chart 7-11: Roads of substandard surface as a ratio of the total road network (2017)



Source: Magyar Közút.

Economic convergence is predicated on rapid, affordable transport and the development of Hungary's interconnectedness with the neighbouring countries. Implementation of infrastructure developments may contribute to making public transport be a competitor to cars and to reducing the railway and long-distance coach travel times. It would be appropriate for Hungary to make better use of its central geographical location and its transit role resulting from that, which could be supported by strengthening the connection to international traffic and transportation routes. On the one hand, within the scope of the Three Seas Initiative the implementation of the north-south Via Carpathia route, and on the other hand, the construction of the Budapest - Warsaw express railway line could help strengthen interconnectedness in Central and Eastern Europe. In addition, Hungary's participation in the new Silk Road network as actively as possible is also an important goal. The preparation of the Hungarian road network for the challenges generated by the 4th industrial revolution (e.g. suitability for use by autonomous cars) may also contribute to achieving a more advanced economy. Development of the infrastructure is likely to increase the share of logistics in economic output, which also supports the achievement of a more competitive economy. This may be facilitated by the development of the port infrastructure in river transport and the development of facilities related to the carriage of goods by air.

Investments in infrastructure permanently increase gross output and make the operation of the economy more productive (European Commission, 2014). According to the empirical research conducted among the OECD countries, the increase in public funds spent on infrastructure contributes to the rise in real output (Kamps, 2004). Analysts at the IMF also came to the conclusion that higher public sector spending on infrastructure strengthens GDP growth (IMF, 2014). A positive effect was identified both over the short and the long run when infrastructure investments are implemented efficiently. A substantial part of the literature also found a positive relation between infrastructure investments and total factor productivity. Based on the analyses by Aschauer (1989a, 1989b), public funds spent on infrastructure increase total factor productivity. A similar impact was also demonstrated by the calculation of Otto and Voss (1994) and co-authors Shanks and Barnes (2008).

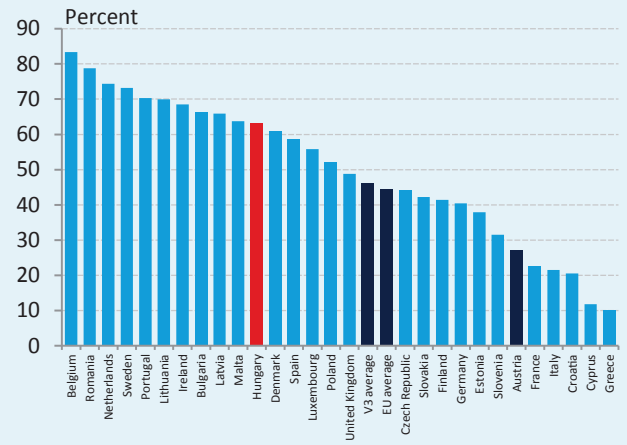
If the accessibility of a region improves, it may enhance employment and labour productivity (Gibbons et al., 2017). An empirical economic survey related to the UK road network came to the conclusion that investments in public roads lead to demonstrable economic benefits even in countries which already have a developed road network. Having examined the development of the road network between 1998 and 2008 they found that a 10 percent improvement in accessibility increases the number of enterprises and employment in the region, particularly in industry, by 3–4 percent. According to their results, in the case of already functioning enterprises, wage and labour productivity also increases as a result of the development of the related transport infrastructure.

7.4.2 MODERN TELECOMMUNICATION INFRASTRUCTURE

The industrial revolutions were accompanied by the infrastructure revolution of their era, such as railways in the 19th century and motorways in the 20th century. The infrastructure of the 4th industrial revolution is the telecommunication network, and particularly wireless data transmission. The key resource of the 21st century may be data and the rapid transmission of data is a measure of competitiveness. On the one hand, the extensive use of broadband internet and the mobile 5G network fosters the digitalisation of the economy, which increases the efficiency and productivity of the service sector. On the other hand, among households it facilitates the use of the new devices appearing in the 4th industrial revolution (e.g. household appliances communicating with each other), which may lead to an expansion of welfare. In addition to the positive effects on the corporate sector and households, the spread of modern telecommunication devices also facilitates the digitalisation of public administration, which frees up labour force.

Broad-band internet access in Hungary is relatively cheap compared to other EU member states and is thus widely spread. The share of the fast internet subscriptions (reaching a download speed of 30 Mbit/sec) in all broadband internet subscriptions is 63 percent, which exceeds the EU average by almost 20 percentage points, but lags behind the vanguard countries by 15–20 percentage points (Chart 7-12). It is a considerable competitive advantage for Hungary that the price of broadband internet is the second cheapest after Lithuania in the EU.

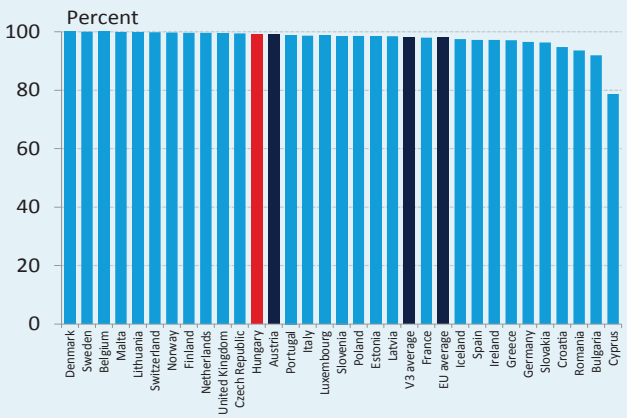
Chart 7-12: Access to super fast internet as a percentage of fixed broadband subscriptions (2017)



Note: Super-fast internet means internet with a speed of at least 30 Mbit/sec.
Source: European Commission.

In the fourth generation mobile internet coverage, Hungary is a top player compared to the EU member states, but the number of mobile internet subscriptions is low. In Hungary, 4G coverage is almost full (99 percent), with similar ratio in the rural areas as well, which exceeds the EU average (Chart 7-13). However, in terms of the number of mobile internet subscriptions per 100 users (49), Hungary is the last among the EU member states.

Chart 7-13: 4G coverage (2017)



Source: European Commission.

In recent years a number of measures have been taken to strengthen and maintain Hungary's competitiveness in the area of digital infrastructure. Among others, the government launched the Super-fast Internet Programme, the purpose of which is to make broadband internet with a speed of at least 30 Mbit/sec available in all Hungarian households by the end of 2018. Within the scope of the Digital Welfare Programme (DWP), the VAT on internet was reduced from 27 to 5 percent in two steps by 2018, which decreased the costs of internet services. The Digital Welfare Standard Package was also introduced with a view to reducing the price of internet access; this solution is cheaper by at least 15 percent even compared to the existing cheapest internet packages offered by the service providers, for subscribers who do not yet have internet subscription. In addition, by the end of 2018 free, broadband WIFI service will become available in all Hungarian settlements at least in one public institution and at least in one public area (Government of Hungary, 2015).

There are several forward-looking government initiatives in progress at present as well, with the goal of makinge Hungary a leader in digitalisation among EU countries. DWP 2.0, approved by the government in 2017, extended the DWP, and formulated proposals in a variety of areas for the digitalisation of the economy, the state and society. The 5G Coalition was established in Hungary in 2017 with a view to developing and building state-of-the-art mobile internet solutions, one key tasks of which is to foster the development of the internet of things and making Hungary a leader in this area in international comparison. It is promising that in the area of 5G network none of the countries have yet gained a substantial advantage, since the mass development and application of the technology is still in its initial stages. The Artificial Intelligence Coalition was recently created, the purpose of which is to foster the more extensive application of the accomplishments of the 4th industrial revolution.

The functioning of the modern telecommunication infrastructure requires a safe environment. According to the Global Cybersecurity Index of the International Telecommunication Union, Hungary's cybersecurity maturity lags behind the Austrian level and the EU average. In addition to the shortcomings in cybersecurity at the national level, 80 percent of Hungarian companies have no advanced cybersecurity solution in place and in terms of robot attacks infected by malware Hungary is ranked first in an EU comparison (Government of Hungary, 2017).

The spread of the modern telecommunication solutions helps services gain importance in the Hungarian economy and contributes to economic growth. The development of new telecommunication solutions facilitates the servitisation of the economy, and improves productivity through its efficiency enhancing role. In addition, the possibility of applying the latest telecommunication solutions also stimulates corporate innovation. Röller and Waverman (1996) also reported a positive correlation between the development of telecommunication infrastructure and economic growth.

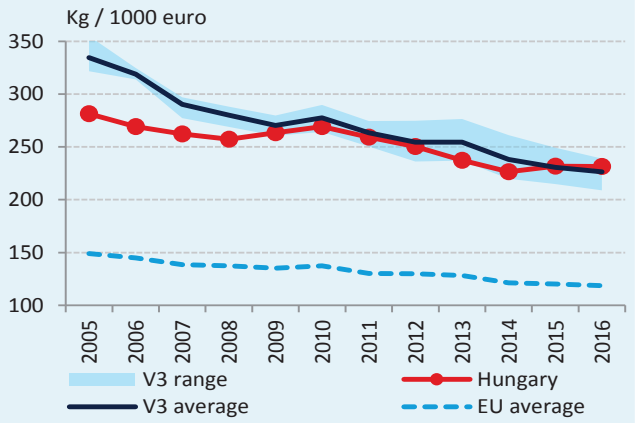
The development of 5G technology boosts GDP over the short run and contributes to raising productivity over the long run. In the short term, the development of 5G technology contributes to GDP growth through its investment-stimulating role, on the demand side. In the long term, the new internet technology may also have a positive effect on productivity. On the one hand, it simplifies large volume, complex exchanges of information, which reduces costs and the amounts thus saved may be used for other productivity-improving expenditures. On the other hand, productivity may also improve as a result of the higher efficiency of the devices able to use 5G, if these devices become widely used (Australian Government, 2018).

7.4.3 MODERN ENERGY MANAGEMENT AND ENERGY INFRASTRUCTURE

Excessive energy consumption is expensive and pollutes the environment, and thus the reduction of energy consumption supports sustainable growth. Energy efficiency is measured by the volume of energy used for the production of output of EUR 1,000. The less energy is required for such production, the more energy efficient the operation of the economy is. This means saving on the one hand, and reduces imports and dependency on external factors, on the other hand. As a result of the decrease in energy consumption, environmental burdens also decline.

At present, the national economy's energy intensity in Hungary is approximately the double the EU average (230 kg / EUR 1,000). This is mainly attributable to domestic enterprises and the obsolete energy management of households (Chart 7-14). Although energy intensity in Hungary fell by 18 percent between 2005 and 2015, there is still plenty of room for a further reduction in the difference.

Chart 7-14: Energy intensity of the economy

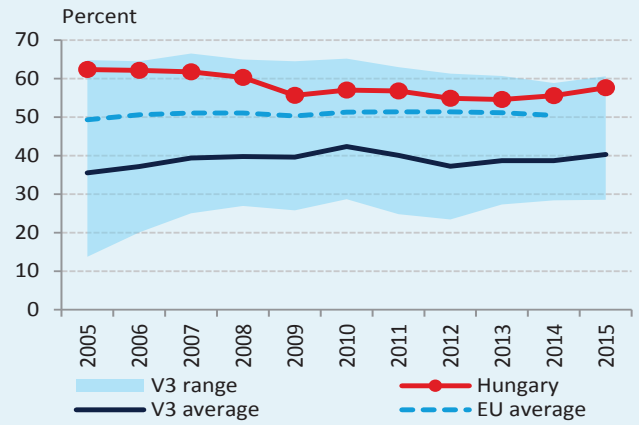


Source: Eurostat.

Examining the consumption sectors, major differences can be identified in the degree of energy consumption. At present, the largest consumer of energy is the household sector (34 percent), followed by the transport sector (25 percent) and the industry (24 percent). In the case of Hungarian households, energy intensity stagnated, while in the European Union it decreased on average, and thus the gap between the Hungarian and EU energy intensity rose (38 percent). **In Hungarian industry, energy intensity rose in absolute terms as well**, while it declined in the EU, and thus compared to the EU average Hungary has the biggest lag in industry (66 percent). **The energy intensity of Hungarian services fell to less than the half of the 2005 figure** (European Commission, 2017).

As a result of the high energy consumption and low domestic output, net energy imports exceed the V3 average by roughly 20 percentage points (Chart 7-15). Hungary is almost fully dependent on coal, while 90 and 70 percent of crude oil and natural gas consumption, respectively, come from imports (European Commission, 2017). The large share of Hungary's energy imports (58 percent) undermines the trade balance and strengthens Hungary's dependence on energy exporter countries. **Energy dependency may be reduced by the expansion of domestic production capacity, in addition to increasing efficiency.** If the volume of energy generated in Hungary increases, it supports the replacement of energy imports and also contributes to a safer energy supply. **In Hungary, the expansion of domestic capacities follows from the implementation of the Paks 2 project. In the framework of the Paks 2 project, the total capacity of the nuclear power station will increase from the current 2,000 MW to 4,400 MW by 2030, and the expansion of the production of renewable resources also supports this process.**

Chart 7-15: Net energy imports as a percentage of total energy consumption



Source: World Bank.

The share of renewable resources in energy consumption was 14 percent in 2016, which falls short of the Austrian ratio by 20 percentage points. The structure of Hungarian renewable resources is unfavourable. In Hungary, 92 percent of the renewable energy comes from biomass (i.e. mostly firewood) and from the recycling of renewable waste; however, the heating value of these is low and the environmental burden generated by their use is high.

The quality of the Hungarian energy network exceeds the EU average. The quality of the energy network can be measured by unplanned outages. In the Hungarian electricity network, the length of unplanned outage per consumer is 59 minutes per year, which is 37 minutes lower than the EU average and 65 minutes less than the V3 average, but exceeds the Austrian value by 18 minutes (CEEI, 2018). The improvement of the capacity of electricity networks and the further reduction of unexpected network outages may contribute to the spread of new solutions appearing during the 4th industrial revolution (e.g. electric cars).

Decreasing the energy intensity gap between Hungary and Austria by half would generate savings of 2.5-3 percent of GDP for the economy. If Hungarian energy consumption falls to three quarters of the present level, substantial funds can be saved as a result of the lower energy consumption, which can be used for investments, wage increases and corporate dividend payments. The energy efficiency investments are in line with the EU regulatory requirements, improve the external and internal balance, raise potential GDP and generate demand in construction. (Balatoni – György – Nagy, 2012). Accelerating the renewal of the domestic stock of dwellings and public buildings would provide outstanding support for the reduction of energy consumption, since two thirds of the domestic building stock is obsolete in terms of energetics. In addition, the faster spread of more environmentally-friendly technologies in industrial production and the rejuvenation of the car fleet may also have positive impact on the reduction of energy consumption.

The increase in energy efficiency may contribute to reducing the ratio of the Hungarian net energy imports. As a result of the declining domestic energy consumption and the rise in the ratio of energy produced in Hungary, the present energy import ratio of 55-60 percent may fall below 40 percent. As a result of this, the savings may exceed HUF 600 billion annually, which would improve the trade and current account balances. In addition, the decline in import dependency would also increase the economy's internal value-creating capacity (see Section 6). The increase in the ratio of renewable resources above 30 percent (close to the Austrian level), would also contribute to a decline in import demands. The preservation of low energy prices is a precondition for cost-efficient production, and thus in Hungary, in the case of households, continuous monitoring of the possibility of further reductions in regulatory prices and the development of the energy exchange for industrial consumers may be important means of maintaining an internationally competitive economy.

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Count István Széchenyi

(21 September 1791 – 8 April 1860)

Politician, writer, economist, minister for transport in the Batthyány government whom Lajos Kossuth referred to as 'the greatest Hungarian'. His father, Count Ferenc Széchényi established the Hungarian National Museum and Library; his mother, Julianna Festetich was the daughter of Count György Festetich, the founder of Georgikon, an institution for the teaching of agricultural sciences.

With his ideas – whose message remains relevant even today – and his activities both as a writer and a politician, István Széchenyi laid the foundation for modern Hungary. He is one of the most eminent and significant figures in Hungarian politics whose name is associated with reforms in the Hungarian economy, transportation and sports. He is also known as the founder and eponym of numerous public benefit institutions, a traveller all across Europe and an explorer of England as well as the champion of economic and political development at the time. István Széchenyi recognised that Hungary needed reforms in order to rise, and considered paving the way for a Hungary set on the path of industrialisation and embourgeoisement to be his calling in life.

Published in 1830, his Credit outlined the embourgeoisement of Hungary and summarised its economic and social programme. Count Széchenyi intended this writing to make the nobility aware of the importance of the country's desperate need for a social and economic transformation. Another work of his, Stádium [Stage of Development] (1833) listed the cornerstones of his reform programme in 12 points, including the voluntary and compulsory liberation of serfs; the abrogation of avicitas (inalienable status of noble property); the right of possession for the peasantry; and the freedom of industry and commerce. This work of Széchenyi already conveyed the idea of equality before the law and the general and proportionate sharing of taxation.

After the revolution in 1848 István Széchenyi joined the Batthyány government and as minister embarked vigorously on implementing his transportation programme.

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