

## GROWTH REPORT



2021

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

Hitel (Credit) 178. Count István Széchenyi



## GROWTH REPORT

Published by the Magyar Nemzeti Bank Publisher in charge: Eszter Hergár H-1054 Budapest, Szabadság tér 9. www.mnb.hu ISSN 2416-3651 (print) ISSN 2416-3716 (on-line) 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 analysis was prepared by the Directorate Economic Forecast and Analysis, under the general guidance of Gergely Baksay, Executive Director for Economic Analysis and Competitiveness. The Report was prepared by staff at the MNB's Directorate Economic Forecast and Analysis. The Report was approved for publication by Dr György Matolcsy, Governor.

The Report also incorporates valuable input from other areas of the MNB.

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# Hungary's readiness for the post-coronavirus socio-economic environment

The Growth Report offers a comprehensive overview of the trajectory of the Hungarian economy in a longue durée perspective, including its expected directions, and the most important factors determining this trajectory. The Magyar Nemzeti Bank analyses trends in economic growth in several regular publications, such as the Inflation Report, the Report on the Balance of Payments, Competitiveness Report and the Financial Stability Report. These publications typically focus on the short and medium-term developments in the economy, specifically analysing changes in variables which determine the directions taken in monetary policy. The aim of the Growth Report is to provide a matter-of-fact representation of the longer-term trajectory of Hungarian economic indicators, in some cases spanning an entire business cycle, as well as their determining factors, using both standard and alternative indicators.

**COVID-19 has triggered the most severe health emergency of the last one hundred years worldwide**. The epidemic became global in the space of a few weeks and claimed nearly 4 million lives worldwide by the end of June 2021, according to data provided by Johns Hopkins University. In terms of fatalities as a percentage of the population (approximately 0.05 per cent), the current pandemic falls short of the largest epidemics in history, such as the epidemic in the Antonine era (2nd century), the plague during Justinian's reign (6th century), the Bubonic Plague in the mid-14th century, the smallpox outbreak of 1520 in the New World, and the Spanish Flu (1918–1919) all of which claimed the lives of more than 2 of the population. Nevertheless, as regards its socio-economic impact, the coronavirus has also triggered and accelerated a number of changes. In the new world emerging in the aftermath of the pandemic, some factors become more highly appreciated, while others lose some of their significance. Hungary's performance in terms of the critical growth factors of the post-COVID period will be decisive for its economic performance over the coming years and decades.

Readiness for the post-coronavirus socio-economic environment is of paramount importance in a changing world economy. The outbreak hit a global economy in transition. Trends in health, labour market, digitalisation and the transformation of value chains have all been strongly affected by the crisis, which provides a singular opportunity to move towards ecological sustainability. In the following sections, we examine how prepared Hungary is for the new challenges in these areas compared to other EU countries (Chart 1). The lessons learned from the virus have confirmed the importance of healthcare readiness, which is assessed on the basis of healthcare capacities in addition to the health vulnerability of the population. The virus may herald in a new era of teleworking, potentially accompanied by an acceleration of the automation and robotisation trends that had already been underway for years. In our analysis, the labour market pillar comprises the sub-pillars of the structure of labour markets, teleworking, and the required skills. Digital readiness is determined by four aspects: digital infrastructure, digital security, e-commerce, and digital banking and payments. Globalisation had already reached a turning point before the coronavirus outbreak, and the coming years could be shaped by the direction in which global value chains are transformed, the issues of deglobalisation and regionalisation, and the possible shift of geopolitical centres (Baldwin and Tomiura, 2020; Enderwick and Buckley, 2020). We assess readiness for the transformation of value chains against the ability to add value, infrastructure and logistics, the competitiveness of exports, and the use of advanced corporate technology. The environmental aspect of sustainability is becoming increasingly appreciated with the passage of time. In our analysis, ecological readiness is described through the indicators of the circular economy, green finance, and electromobility. The pillars are quantified from 85 standardised indicators (Table 1 in the Annex).



Note: Standardised values.

Source: MNB based on WDI, WHO, OECD, World Bank, IHME GBD, GHSI, Eurostat, Eurofound, Beblavý et al. (2019), Európai Bizottság, WB Global Financial Inclusion, ACEA, Bloomberg, Tradingplatforms, EAFO, DHL, WEF GCI and OEC.

Hungary's readiness for the post-coronavirus world falls short of the EU average, and efforts are needed to connect to emerging megatrends. Overall, Hungary's healthcare is slightly below average, which, however, is the result of two opposite processes. While the health vulnerability of the Hungarian population is high, the capacities of Hungary's care system are more favourable compared to the Visegrad and Baltic countries, at similar levels of economic development. The structure of the Hungarian labour market is relatively favourable, as demonstrated by its resilience during the economic recession caused by the coronavirus. At the same time, Hungary is lagging behind the Visegrad and Baltic groups in teleworking, a field crucial to the transformation of the labour market, and ranks the lowest in Europe in terms of the capabilities that determine the future. For the adequate readiness of the Hungarian labour market, the acquisition of new skills by employees and the provision of lifelong learning and reskilling and upskilling by employers are essential. Overall, Hungary's digital readiness is more favourable than the average of Czechia, Poland and Slovakia (V3), which is mainly explained by the wider coverage and more advanced state of Hungarian digital infrastructure. At the same time, additional room for progress can be identified in e-commerce and online banking, which attained new heights due to the epidemic. Hungary is deeply integrated into the value chains, especially in the automotive industry, whereby the transformation is both an opportunity and a challenge for industry actors. Calls for regionalisation and reshoring have recently grown stronger, which may reshape the system of global production that has emerged in the past decades. The ability of the Hungarian economy to add value is low due to its high demand for imports and could be supported through improvements in Hungarian companies' innovative capabilities, the widespread adoption of advanced technology and the increasing appreciation for services. That said, the competitiveness of Hungarian exports (based on wage costs) is expressly favourable even in European terms, which may make the Hungarian economy a priority destination to attract foreign working capital in the future. Looking ahead, the transition to a green economy and ecological sustainability are becoming increasingly prominent. The improvement of Hungary's energy efficiency, which is below the EU average, is an essential enabler of the circular economy. Regarding the uptake of electromobility, Hungary is ranked favourably within the region, but needs further development to its infrastructure. The financial transmission system has a key role in financing investments that promote environmental sustainability. In the field of green finance, Hungary's position is more favourable compared to the average of both the EU and V3.



In Europe, the Netherlands, Scandinavia and Germany are most prepared for the post-coronavirus socio-economic environment. Based on our Sustainable Future Index, which is the aggregate readiness in terms of healthcare, labour market, digital, ecology, and value chain transformation, Hungary's readiness falls short of the EU average, to which each pillar contributes to a certain degree (Chart 2). Among regional competitors, the Hungarian index outperforms those of Slovakia and Poland, but lags behind Czechia. The higher readiness of the latter is primarily explained by its more favourable labour market and digitalisation pillars. Among European countries, levels of readiness essentially show a pattern that is essentially divided along a northwest-southeast axis.





The Sustainable Future Index, which we have created, is an indicator of the ability for future growth. Composed of structural indicators, the high value of the index indicates better readiness for the post-pandemic period and more favourable opportunities arising from megatrends. Hungarian economic policy seeks to ensure a convergence path that is sustainable in the long run, for which the Sustainable Future Index identifies the key bottlenecks of the changing world economy. Progress in the structural indicators that constitute the pillars may contribute to the convergence of the Hungarian economy, which is also supported by the strong correlation between the Sustainable Future Index and the level of economic development (Chart 3).





Source: Our World In Data, WHO, WDI.

The health status and vulnerability of societies acquired particular significance in the most severe health emergency of the last one hundred years. The most immediate effect of the rapid spread of the virus was that it posed serious challenges to health systems. Lockdowns, distancing, wearing social mask and hygiene recommendations were designed to slow down the increase in the number of infections, but the mortality trend was also significantly influenced by the health vulnerability of societies. The proportion of the elderly in the population and of the obese among adults shows a positive correlation with the number of deaths due to the coronavirus (Chart 4). Kass (2020) demonstrated that obesity significantly increases the risks in the clinical course and mortality rate of COVID-19, whereas Gardiner et al. (2021) found that the variation in mortality across countries

is largely explained by the proportion of the overweight population. In Europe, Hungary has the second highest ratio of obese people within the adult population, which is coupled with high ratios of people suffering from cardiovascular diseases and diabetes. Improving health consciousness among the Hungarian population and reducing its health vulnerability are prerequisites for increasing resistance to future epidemics.

As a result of the coronavirus, the availability and quality of the healthcare system as well as healthy lifestyles have grown in importance. In line with the gradual transformation of population pyramids and the ageing of societies, the megatrend of the transformation of health systems in advanced economies has been under way in recent decades. The pandemic has highlighted the importance of adapting healthcare capacities and systems. By international standards, healthcare capacities in Hungary are favourable: the number of hospital beds per thousand population is one of the highest in Europe, while the number of doctors per thousand population corresponds to the average of the countries in the region (Chart 5). At the same time, the recent period has highlighted the importance of quality features and the digitalisation of healthcare. Virtual physician-patient meetings and the spread of telemedicine are essential in health systems prepared for the future, and can be encouraged by the experience gained during the coronavirus.



Note: 2016-2019 averages for hospital beds based and 2016-2018 averages for number of physicians. Source: WDI.

### LABOUR MARKET READINESS 18/27

Required skills 24/27 Telework 18/27 Labour market structure 11/27

Labour market transformation, expected to be accelerated by the coronavirus pandemic, affects different jobs to different degrees, which leads to greater appreciation than ever before for the required skills and abilities to avoid polarisation in the labour market. Digital and IT knowledge are indispensable in the transformation driven by technological development and complex problem solving or being a good negotiator is valuable precisely because it cannot be automated.

In terms of the skills required, Hungary is poorly prepared for the post-coronavirus world. The population's core digital and software skills are below the EU average and of the Visegrad countries, while Hungary ranks the lowest in Europe in terms of basic communication skills (Chart 6, right panel). In Hungary, the proportion of participants in adult education is only half of the EU average.

**Experience gained during the coronavirus pandemic may lead to a new era of teleworking, for which adequate preparedness is essential on the part of both employers and workers.** Before the outbreak, the proportion of teleworkers in Hungary was modest in a European comparison (Chart 6, left panel). Teleworkability is influenced by the quality of the digital infrastructure, the proportion of employees using computers and the internet in their work, as well as sectoral and job characteristics (Dingel and Neiman, 2020; ILO, 2020). In the coming years, automation could accelerate and a new division of labour could emerge between humans and machines (McKinsey, 2021).







Note: Current prices, purchasing power standard GDP per capita. Source: ILO (2020), Eurostat, WDI.



Further improving the labour market situation of vulnerable social groups is of paramount importance. Most European labour markets have adjusted to the changing economic environment as a result of the coronavirus on the intensive side, i.e. in terms of the number of hours worked. In Hungary, credit market dynamics that remained healthy despite the economic recession, the general credit moratorium, and the short-time work schemes put in place all helped to curb redundancies, supported workers' incomes, and also reduced corporate wage costs. Although the labour market has proved resilient to the effects of the coronavirus in the short term, it will remain in the focus of economic policy in the coming period due to the risks surrounding the speed of economic recovery and the possible downturn in profitability. Female employees, people aged 15-24 and the low-skilled tend to be more sensitive than the average to the boom and bust cycles in the economy. In 2020, the

unemployment rate of these vulnerable groups (Chart 7) was not affected particularly unfavourably, yet further improving the structure of the labour market and strengthening the employment of these groups remain key objectives. As demographic challenges are intensifying steadily, the role of labour market reservoirs and skills are gaining greater appreciation. A shift towards a structure of higher qualifications could contribute significantly to the increase in the employment rate.



**Digital infrastructure of adequate quality and high coverage is essential in the post-coronavirus world.** Directly following the rapid spread of the pandemic, lockdowns, social distancing, and working from home significantly intensified the megatrend of digitisation that had already been under way for decades. While society and the economy both faced the shocking surge in the need to use the digital space at the acute stage of the virus, the successful experience gained during the pandemic is expected to be embedded in longer-term corporate and consumer trends. The quality of digital infrastructure and coverage is essential to meet the basic need for increased online activity. The quality of Hungary's digital infrastructure is favourable, its fast broadband internet coverage exceeds the average of the EU and the Visegrad countries while Hungary's readiness for 5G is among the best in Europe. (Chart 8). At the same time, the deployment of corporate digital infrastructure needs to be improved. In a European comparison, few companies in Hungary have their own websites or use customer relationship management (CRM) systems.





Shopping, trade and banking are increasingly taking place in the digital space. During the pandemic, contactless shopping and administration have gained significant prominence, and are expected to persist. According to a survey by PwC (2020), the number of online purchases and deliveries has increased considerably in a wide range of product groups. Several features of the "my home is my castle" mindset (electronic administration and online shopping), which are increasingly defining consumer behaviour, will persist even after the epidemic has subsided. The share of domestic households shopping and banking online, as well as companies participating in e-commerce, also lags behind the EU and Visegrad countries average (Chart 9). Increasing the importance and efficiency of domestic e-commerce and developing digital financial infrastructure and awareness can be the key to satisfying changing consumer needs.



The shift towards production and services of higher added value is the basic precondition for the improvement of the Hungarian economy. The role in value chains is decisive in terms of the ability to create value, as the highest added value is typically generated at the start and at the end of the chain (Baldwin, 2012; Ye et al., 2015). Hungary is primarily involved in the production stages of the processing industries; therefore it depends heavily on imports of semi-finished (interim) products and services. The domestic added value of exports is low both compared to Europe and among countries with similar economic structures in the region, in both manufacturing and market services (Chart 10). As a result of the coronavirus, global value chains are also being transformed, which is an opportunity for Hungary to move to the next level. Strengthening the role of domestic services related to production and exports (R&D, marketing) and the development of supplier networks are key factors in increasing the ability of the economy to add value.



Hungary's ability to attract capital is high; however, the use of emerging technologies in companies is essential in order to move up the value chains. Due to its favourable geographical location and wage cost, Hungary has been a popular target for foreign working capital in the recent period. The economic importance of the high-tech manufacturing industry and the share of high-tech exports in Hungary are at the forefront of Europe. One of the macroeconomic indicators of the expected return on investments is the added value per unit labour cost, which continues to make the Hungarian high-tech manufacturing industries may continue to underpin Hungary's ability to attract capital, but improving the innovative capacity of Hungarian companies, higher share of services, and the widespread uptake of emerging technologies are essential for increasing productivity. Regarding the use of advanced technologies, Hungary ranks at the bottom of the list in Europe (Chart 11, right panel).





The megatrend of green transition of the economy and society started earlier, but the coronavirus is a unique opportunity for ecological change. Affordable and clean energy, sustainable cities and communities, responsible production and consumption, action against climate change, and environmental protection are among the 17 Sustainable Development Goals (SDGs) recognised by the UN (UN, 2020). The issue of sustainable economic growth has been a concern for economists for many decades, the ecological aspect of which has become increasingly important in recent years (Stern, 2006; Nordhaus, 2017). The circular economy is a framework that improves resource security and reduces the burden on the environment through more efficient use and allocation of resources. Hungary's energy efficiency (GDP per unit of energy consumption) is below the EU average and the share of renewable energy sources is also relatively low among the countries of the continent (Chart 12). In order to improve Hungary's ecological readiness, apart from changing the attitudes of economic actors, a change in controlled technology is essential. The state plays a prominent role in greening resources and innovations.



The financing of investments driving the green transformation plays a key role in the transition. Expenditure worth more than USD 14,600 billion has been announced worldwide to tackle the coronavirus and stimulate economic recovery, with a mere 2.5 percent linked to green initiatives (O'Callaghan and Murdock, 2021). Post-COVID recovery budgets provide a singular opportunity to improve ecological sustainability, which, according to announcements to date, has mostly been embraced by Denmark, Finland, France, Germany, and Poland. Hungary's transition to green finance has already started, an important milestone being the launch of the green bond market in 2020. However, the further mobilisation of environmentally sustainable private resources is necessary to achieve national and international objectives.

The pandemic could be a turning point in the spread of electromobility. Even before the emergence of COVID-19, the transformation of vehicle manufacturing and transport determined the behaviour of industry actors. The mainstreaming of environmental considerations and the expansion of Asia, of China in particular, in the field of electric propulsion technology have already led European vehicle manufacturers to adapt in recent years. As Hungary is deeply integrated into the German automotive value chains, the increasing megatrend of electromobility is of exceptional importance in the operation of domestic industry players. The pandemic could bring a breakthrough in sales as well as production. In the past period, several governments have announced incentives for the purchase of electric cars, while developing electric charging networks in their countries (McKinsey, 2020). The share of electric and hybrid propulsion in new car sales in Hungary, as in Scandinavia and the Netherlands, is among the highest in Europe (Chart 13), which is particularly welcome in the light of the relatively high average age of passenger cars in Hungary. The further expansion of electric charging stations, the coverage of which in Hungary is currently at the regional average, is critical for the wider spread of electromobility.



#### ANNEX:

Table 1: Variables constituting Post-COVID Index						
	Indicator	Hungary's rank in the EU	Period	Source		
¢	HEALTHCARE R	EADINESS				
	HEALTH VULNERABIL	ITY OF SOCIETY				
	Proportion of citizens above 64 years of age	11/27	2019	WDI		
	Death by cardiovascular diseases (for 100,000 citizens)	23/27	2019	IHME GBD, WDI		
	Obessity among adultsd	26/27	2016	WHO		
	Proportion of people with diabetes	19/27	2019	WDI		
	HEALTHCARE CA	PACITIES				
	Health capacity index	20/27	2019	Global Health Security Index		
	Hosptial beds per head of population	4/27	2016-2019	WDI		
	Number of physicians per 1,000 people	15/25	2016-2018	WDI		
	Proportion of people with access to public health	10/27	2017	WDI		
	Reaction to pandemic outbreak and its control	11/27	2019	Global Health Security Index		

LABOUR MARKET READINESS						
REQUIRED SKILLS						
Participation in adult education	21/27	2019	Eurostat			
Proportion of people with basic infromation skills	20/27	2019	Eurostat			
Proportion of people with basic communication skills	27/27	2019	Eurostat			
Proportion of people with basic problem solving skills	5/27	2019	Eurostat			
Proportion of people with basic software skills	14/27	2019	Eurostat			
Proportion of people with basic digital skills	15/27	2019	Eurostat			
Proportion of corporations developping info-communication skills	20/27	2020	Eurostat			
Proportion of people participating in E-learning	17/27	2020	Eurostat			
Digital life-long learning index	14/27	2019	Beblavý et al. (2019)			
TELEWOR	<b>‹</b>					
Proportion of people in home office	21/27	2019	Eurostat			
Hours worked from home office (June-July 2020)	14/23	June-July 2020	Eurofound			
Proportion of people supportng home office (June-July 2020)	15/25	June-July 2020	Eurofound			
Households using computer on a daily basis	11/27	2017	Eurostat			
Proportion of employees using computer and internet	22/27	2020	Eurostat			

LABOUR MARKET S	STRUCTURE		
Unemployment rate among 15 to 74 year-old citizens	5/27	2020	Eurostat
Unemployment rate (women)	6/27	2020	Eurostat
Unemployment rate among 15 to 24 year-old citizens	8/27	2020	Eurostat
Unemployment rate (low qualification workers)	12/27	2020	Eurostat
NEET share	19/27	2020	Eurostat
Share of part-time workers (manufacturing)	15/26	2020	Eurostat
Share of part-time workers (services)	22/26	2020	Eurostat
DIGITAL READ	DINESS		
DIGITAL INFRAST	RUCTURE		
Population covered by fast broad band internet	13/27	2020	Európai Bizottság
4G coverage	20/27	2020	Európai Bizottság
5G readiness	3/27	2020	Európai Bizottság
Firms with homepage	22/27	2020	Eurostat
Corporations using CRM system	27/27	2019	Eurostat
Duality of the usage of CRM system (Large corporations-SMEs)	3/27	2019	Eurostat
Participation in e-public administration	16/27	2020	Eurostat
DIGITAL SECU	JRITY		
Proportion of people sensing security concerns	8/26	2019	Eurostat
Proportion of people limiting internet activity for security reasons	4/27	2019	Eurostat
Corporations revising info-communication security policy	24/27	2019	Eurostat
E-COMME	RCE		
Proportions of corporations using e-commerce	20/26	2020	Eurostat
Duality of corporations using e-commerce (Large corporations-SMEs)	13/26	2020	Eurostat
Proportions of people shopping on-line	15/25	2020	Eurostat
DIGITAL BANKING A	ND PAYMENT		
Proportions of people using credit card	22/27	2017	WB Global Financial Inclusion
Households using online banking	20/27	2020	Eurostat
On-line banking penetration	18/27	2019	Tradingplatforms
Proportion of people shopping on-line (financial services)	14/25	2020	Eurostat

READINESS FOR THE TRANSFORMATION OF VALUE CHAINS						
VALUE-CREATING	G ABILITY					
Proportion of domestic and foreging (non-resident) economic activity	18/27	2019	DHL			
Geographical exposure of ecnomic activity with non-residents	13/27	2019	DHL			
Domestic value added content of export (Manufacturing)	26/27	2016	OECD			
Domestic value added content of export (Services)	20/27	2016	OECD			
INFRASTRUCTURE,	LOGISTICS					
Logistic performance index (infrastructure)	14/27	2018	World Bank			
Logistic performance index (deliery time)	16/27	2018	World Bank			
Road interconectivity	16/27	2019	WEF GCI			
Quality of roads	21/27	2019	WEF GCI			
Densitiy of railways	6/25	2019	WEF GCI			
Airport connection	18/27	2019	WEF GCI			
EXPORT COMPET	<b>FIVENESS</b>					
Economic complexity	7/25	2019	OEC			
Share of value added (high-tech manufacturing)	1/19	2018	Eurostat			
Share of value added (high-tech services)	7/24	2018	Eurostat			
Share of high-tech exports	6/27	2018	Eurostat			
Unit labour cost per value added (high-tech manufacturing)	2/19	2018	Eurostat			
Unit labour cost per value added (high-tech services)	11/23	2018	Eurostat			
USE OF EMERGING TECHNOLOGIES						
Use of cloud based systems	23/26	2020	Eurostat			
Corporate duality of the use of cloud based systeem	16/26	2020	Eurostat			
Big data analysis	22/27	2020	Eurostat			
Firms using inustrial and servicing robots	21/26	2020	Eurostat			
Corporate duality of firms using inustrial and servicing robots	16/26	2020	Eurostat			
Use of AI	20/27	2020	Eurostat			
ECOLOGICAL READINESS						
CIRCULAR ECO	NOMY					
GDP per unit of energy use (PPS)	17/27	2019	Eurostat			
CO2 emission necessary for production of unit of GDP (PPS)	15/27	2019	OECD, Eurostat			
Share of renewable energy sources (transport and trafic)	11/27	2019	Eurostat			
Share of renewable energy sources (heating and cooling)	21/27	2019	Eurostat			
Share of area with sun collectors	20/27	2019	Eurostat			

Eurostat	2019	4/27	Waste quantity per head					
Eurostat	2019	16/27	Share of municipal waste recycling					
Eurostat	2019	16/27	Energy import dependency					
		ANCE	GREEN FINA					
Eurostat	2017	10/27	Environment protection costs as percentage of GDP					
Eurostat	2019	19/27	Environment protection taxes as a percentage of total tax revenues					
Bloomberg	2020	16/27	Share of issued green bonds (corporations and financial institutions)					
Bloomberg	2020	2/27	Share of issued green government bonds					
		BILITY	ELECTROMO					
ACEA	2019	15/24	Average age os passanger cars					
ACEA	2020	4/25	Share of electric and hybrid vehicles in new passaner car sales					
ACEA	2019	11/24	Share of electric and hybrid vehicles in the number of passaner cars					
EAFO, Eurostat	2020	20/27	Number of charging stations per 10,000 habitants					

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## 1 The Hungarian Growth Model 2010–2019 – The Economy That Was Hit By COVID

In the spring of 2020, the coronavirus, which had been spreading worldwide, also appeared in Hungary, exerting a significant impact on the daily life and functioning of economic actors. As a result of the pandemic, a sudden and deep economic recession emerged, ending the period of Hungarian economic boom that had been ongoing since 2013. Prompted by the effects of COVID, the ever-green theme of economic growth once again rose to prominence among economists and economic policymakers worldwide.

The Global Financial Crisis of 2008–2009 was the most recent major shock to the world economy, which makes it worthwhile to take into account its lessons when planning and implementing the current approaches to crisis management. Economic recovery was typically dynamic in countries where pre-crisis equilibrium indicators were favourable, where targeted measures resulted in faster employment growth, and where digitalisation and the use of advanced technology solutions had been adopted on a wider scale. The 2008–2009 crisis hit the Hungarian economy in a very vulnerable situation, when the country's preceding growth model had relied on excessive indebtedness, in an unfavourable structure. The country's macroeconomic equilibrium indicators were unfavourable, and in addition to the unsustainably high gross government debt to GDP, and external debt, Hungary was characterised by a twin deficit. At the onset of the crisis, Hungary was in the same shoes as the Mediterranean countries, but took a significantly different approach to crisis management. In 2010, Hungarian economic policy recognised the need for tax and fiscal reform, as well as for turnarounds in the labour market, in monetary policy and in lending in order to achieve economic growth while retaining balance.

After rebalancing, economic growth resumed in 2013. Unlike in the preceding growth model, GDP growth was supported by items of domestic demand (consumption, gross fixed capital formation) relying on domestic resources (lending, savings). The growth period between 2013 and 2019 can be seen as comprised of two phases. Between 2013 and 2016, GDP growth was driven in a labour-intensive manner, with a significant increase in employment. As full employment was being approached, the Hungarian economy entered a capital-intensive growth phase from 2017, characterised by dynamically growing investments and improving productivity. Between 2013 and 2019, the increase in household consumption was achieved in a healthy structure, while its investment rate pushed Hungary to the forefront of Europe. As a combined result of these factors, Hungary's economic growth steadily outperformed the EU-27 average. The period of 2010 to 2019 was the most successful decade in Hungary in the past 100 years, given that dynamic economic convergence was achieved while balance was retained.

Hungarian economic growth in 2010–2019 constitutes a growth and economic policy model that can be called the Hungarian Model 1.0. Changes in the Hungarian labour market and tax system during the period concerned were also significant growth factors in international comparison. However, it is also apparent that between 2010 and 2019 the Hungarian model was lagging behind the other countries under review as regards the factors determining technological development. Looking ahead, these technological factors, digitalisation, innovation and the appropriate level of human capital are seen as the main pillars of growth in the next decade, and as such they should become the key to Hungarian Model 2.0.

We also examined what other European growth model Hungarian Model 1.0 is close to. Due to our historical embeddedness and starting position, Hungary's economic performance between 2010 and 2019 was highly similar to the Latvian model of 2010–2019, to the Swedish, Czech, Belgian and Austrian models at the turn of the millennium, and to the Czech, Lithuanian, Slovenian and Irish models of the first half of the 2000s and the first half of the 2010s. This group of countries was characterised by a high degree of openness and outstanding productivity growth. Over a broader time horizon, certain aspects of the Hungarian economy can be seen as similar to the Swedish economy around the turn of the millennium. Both countries were characterised by low unemployment, a current account surplus, and disciplined fiscal policies.

## 1.1 Between two crises: from the Great Recession to the coronavirus

The theme of economic growth is as old as the science of economics. Already Adam Smith (1776) wrote his work laying the foundations of economics with the aim of exploring the causes of economic development, with the inquiry in that field becoming more rigorous and formalised later on. The theoretical examination of economic growth started with the works of Harrod (1939) and Domar (1946), to be superseded by the Solow-Swan model after World War II (Solow, 1956; Swan, 1956). These theories of growth were fundamentally in line with the available statistical data and stylised facts of the era, as described in the works of Káldor (1963) and Kuznets (1966). Theories with an exclusive focus on the study of capital deepening quickly failed due to their inability to provide an endogenous, in-model response to centuries of growth in GDP per capita. This was addressed by simply introducing exogenous, out-of-the-model technological progress, which, as a public good, is accessible to all and increases the overall level of productivity even without capital deepening. However, the dynamics and origins of this technological progress or how it differed across periods and regions had not yet been properly elaborated.

According to the later approach, technological progress is the foundation of growth, and is accompanied by capital deepening. To capture this, a model was first developed by Kenneth Arrow (1962), where he refers to learning-by-doing to explain the overall increase in productivity. At the end of the 1980s, growth theories developed in two main directions: Lucas (1988) and Mankiw – Romer – Weil (1992) focused on the development of human capital, while Romer (1986, 1990) and Jones (1995) focused on modelling the research and development sector. R&D-based models are in many respects akin to regional models explaining the spatial structure, more detailed insight into which is provided by Varga (2009). Nevertheless, the foundation for innovation is identified by many as the institutional environment (Acemoglu et al., 2002).

Rather than being limited to the economic growth of a specific year, these growth theories seek to capture the longer-term trend line of development, typically from the supply side of the economy. However, research carried out in recent years suggests this to be insufficient. As we pointed out in our 2016 Growth Report, there is a demonstrable relationship between the trend of economic growth and cycles (MNB, 2016).

Unfortunately, recessions often leave permanent scars on the ability of individual economies to grow, while an economy with high (demand) pressure can heal these scars fully or partially. Therefore, not only does a recession represent a cyclically important crossroads for an economy, it also determines its performance for years, and possibly decades. The regularity of economic downturns can be confirmed through empirical research and simple statistical data. Between 1850 and 2019, the growth periods of the USA and the United Kingdom were interspersed with economic downturns (Chart 1-1). For both countries, the level of GDP decreased on the previous year at 30-year intervals. Based on historical data, in many cases the convergence path of converging countries was broken during a crisis (Palotai and Virág, 2016). Thus, in our opinion, economic recessions cannot be avoided, but their severity can be reduced and the rapid recovery and, looking ahead, the continuation of economic convergence can be supported by an appropriate set of economic policy tools.



Note: The bars indicate a decline in annual GDP. Source: Williamson (2020) and Bank of England: A millennium of macroeconomic data for the UK.

The development of an appropriate economic policy requires the understanding of the nature of economic growth before the recession. Strange as this may sound, a recommended starting point is the previous recession and recovery. Worldwide, economic performance declined as a result of the latest global shock, the Great Recession of 2008–2009. According to data from 22 large, and mostly developed economies in the world, all countries except Australia and Korea experienced a technical recession (a decline in GDP levels in two consecutive quarters) (Chart 1-2).

difference was caused by the fact that the euro area had entered a debt crisis by 2012 (European Commission, 2016).

Economic recovery was typically dynamic in countries where equilibrium indicators were favourable. As a result of the sovereign debt crisis in the euro area, GDP took long



The pace of recovery from the 2008–2009 global economic crisis varied by country and group of countries. The recent global recession has affected both the US and the euro area economies considerably. Initially, their rates of recovery were similar, but while the US economy had reached its pre-crisis level again by the second quarter of 2011, the euro area economy had dipped back into recession (Chart 1-3).



The recovery pattern was also influenced by the varying degrees of flexibility in labour markets and by variations in households' balance sheet adjustments, while the greatest

years to return to pre-recession levels. Different recovery patterns could be identified not only between the USA and Europe, but also across EU Member States, due to a large extent to the degree of pre-crisis indebtedness of their economies. Economies where the external debt-to-GDP ratio did not exceed 20 percent before the crisis recovered from the crisis as early as 2010. Conversely, for a group of countries with external debt levels of more than 40 percent of GDP (including, in addition to Hungary, the Baltic and Mediterranean countries, among others) recovery took longer, with GDP only exceeding its pre-crisis level again at the beginning of 2017 (Chart 1-4).



Following the crisis, debt levels typically continued to rise. In the 2010s, the gross government debt to GDP ratios increased spectacularly in the world's major economies (Chart 1-5). The debt ratios of the USA, Canada, France and the United Kingdom approximated 90–100 per cent of GDP, while government debt in Italy and Japan was already substantially above those levels. Germany was the only country where the increase in debt was temporary, with the debt-to-GDP ratio returning to its pre-crisis level in 2017. In 2020, the vast majority of countries in the world were hit by the economic recession caused by the coronavirus while struggling with historically high levels of government debt.



# 1.2 2010–2019: the most successful decade in Hungary in the past hundred years

#### **1.2.1 REBALANCING**

The 2008–2009 global crisis hit the Hungarian economy in a very vulnerable situation. Hungary's pre-crisis growth model relied on excessive indebtedness in an unfavourable structure, affecting the state, households (through foreign exchange lending), and companies alike. The country's macroeconomic equilibrium indicators were unfavourable, and in addition to the unsustainably high government debt to GDP, and external debt, Hungary was characterised by a twin deficit, i.e. the simultaneous deficits of public finances and of the current account. In 2010, in addition to the debt crisis, Hungary faced an internal credit crisis, and the unemployment rate also rose to a high level. The macro-financial equilibrium and economic growth entered their respective crises simultaneously (Matolcsy, 2015).

The fiscal turnaround was an essential element of the new growth model. Financial rebalancing was fundamentally conditional on a disciplined budget and a reduction in debt indicators. Economic policy recognised the need to support budgetary revenues with a new tax structure. As part of the tax reform, labour taxes were reduced, while consumption and sales taxes were replaced to ensure budgetary equilibrium. Between 2010 and 2018, Hungary recorded the sharpest fall in the effective personal income tax rate, and, after Latvia, the second sharpest fall in the employer tax wedge (Chart 1-6). The reform of the tax system focused on stimulating job creation and investment. According to Baksay and Csomós (2014), as a result of the rules put into effect since 2010 concerning taxes, contributions, gross incomes and subsidies, over the long term employment and GDP may have increased by about 2 percent and 1.5-2 percent, respectively, accompanied by an improved budgetary equilibrium.



As a result of the new incentives, the domestic labour market has undergone a spectacular transformation. In addition to the reduction of taxes on labour, family taxation, the Széll Kálmán Plan, the Labour Code reform, the Job Protection Action Plan and the expansion of public employment all contributed to the decrease in the unemployment rate. The Hungarian unemployment rate, which exceeded 11 percent in 2010, decreased to 3.4 percent by the end of the decade (Chart 1-7).



Note: PIGS is based on the average of Portugal, Italy, Greece and Spain, while CEE is based on the average of Bulgaria, the Czech Republic, Croatia, Poland, Romania, Slovenia and Slovakia. Among 15-74 year olds. Source: Eurostat.

The increases in the activity and employment rates were also outstanding in international comparison. One of the most prominent objectives of Hungary's crisis management was to encourage job creation and access to employment, and thereby to create a work-based society. While there was a significant increase in unemployment after the crisis in the Mediterranean countries, the Hungarian labour market indicators showed steady improvement. Structural reforms prompted an increasing number of people from vulnerable groups (over-55s, young people, mothers with young children, the low-skilled or the long-term unemployed) entering the labour market, which resulted in a significant increase in the activity and employment rates across Europe between 2010 and 2019 (Chart 1-8). **Debt stocks decreased from historic heights to favourable levels by the end of the decade.** Fiscal reforms resulted in a return to budgetary equilibrium from 2012, with gross government debt to GDP ratio falling from above 80 percent to around 65 percent by 2019. In 2009, Hungary's net external debt amounted to 54.1 percent of GDP, its highest debt ratio in 70 years. By the end of the decade, our net external debt dropped to around 8 percent of GDP owing to the economic policy model that sought to maintain equilibrium (Chart 1-9).



Few countries succeeded in reducing public debt simultaneously with the debt of the private sector. Through a significant increase in debt stocks and the sovereign debt crisis in the euro area, the 2008–2009 crisis drew attention to the trap of debt-financed growth models. Nevertheless, in



the years following the recession, most of the countries saw debt increases or merely rearrangements between the private sector and the state. According to our analysis of nearly 40 countries around the world, only 8 countries managed to reduce their government debt to GDP ratios between 2008–2018 and only three of them managed to reduce their public and private debt ratios simultaneously (Chart 1-10). Hungary was among those three countries.



#### **1.2.2 ECONOMIC CONVERGENCE WITH** RETAINED BALANCE

After rebalancing, economic growth resumed in 2013. Following the recession, Hungarian economic policy faced the challenge of macroeconomic rebalancing as a first step. The previous unsustainable growth model entailed significant indebtedness, which permanently limited economic performance, already falling due to the crisis, as a result of the balance sheet adjustment processes taking place in the period of recovery. As a result of debt deleveraging by households and companies, household consumption and gross fixed capital formation both decreased between 2010 and 2012. By 2012, most of Europe had dipped back into recession in parallel with euro-area sovereign debt, with Hungarian GDP entering another period of decline. Hungary managed to rebalance by 2013, when the current account balance showed a surplus, and government debt and net external debt both decreased steadily. However, economic growth could only resume once the country stabilised its external and internal financing situation.

In a healthier financing environment, the structure of economic growth became increasingly more balanced. Between 2013 and 2019, Hungarian GDP grew by an average

3.8 percent annually, with the largest contribution from items of domestic demand (consumption, gross fixed capital formation) (Chart 1-11). Over the same period, household consumption explained an average of 1.8 percentage points, and gross fixed capital formation 1.9 percentage points of GDP growth. Net exports, which were on average positive between 2010 and 2012, already turned slightly negative in the period 2013-2019, explained by increasing imports as a result of increasing consumption and investments. The period of growth in Hungary between 2013 and 2019 can be seen as comprised of two parts. Up to 2016, economic growth was typically driven in a labour-intensive manner, the period was characterised by a substantial decrease in the unemployment rate and a renewed rise in household consumption. As full employment was being approached, labour market conditions became increasingly tight, driving a shift towards capital. From 2017, the economy entered a capital-intensive phase, with GDP growth accompanied by a lively investment dynamic and improved labour productivity. Improving labour productivity in the SME sector explained a large part of the rise in the productivity of the national economy (MNB, 2020a).

Chart 1-11: Contribution to annual changes in GDP



Note: Actual final government consumption includes social transfers in kind from government, and household consumption includes social transfers in kind from NPISHs. Source: HCSO.

As a result of favourable labour market and income developments, household consumption increased dynamically. As a result of labour market and tax reforms, the balance of households improved significantly after the crisis. Real household disposable income grew by nearly 5 percent on average annually after 2013, providing strong support for consumption growth. Favourable developments in terms of income were driven primarily by rapidly growing employment, then by a double-digit wage increase at the end of the decade (Chart 1-13). Between 2016–2019, household consumption expenditure grew dynamically, with an average annual increase of nearly 5 percent, supported by the previously accumulated high financial net worth, the take-off in retail lending, and consumer confidence reaching historically high levels. Postponed in the period of debt deleveraging, household consumption represented a significant recovery potential for the second half of the decade. It was not until the end of 2016 that the level of household consumption expenditure returned to pre-crisis levels.



Contrary to the pre-crisis period, a dynamic increase in household consumption was achieved in a healthy structure. Between 2002 and 2007, households spent about 90 percent of disposable income on consumption, while their net financial savings rate was particularly low. Unsustainable consumption growth during this period was based on excessive public and household indebtedness in an unhealthy structure (with an increasing proportion of foreign currency). In contrast, between 2013 and 2019, the rapid increase in consumption was achieved against the backdrop of a high savings rate and a gradually increasing retail investment rate (Chart 1-13).



**Investment growth based on internal financing was an important element of the new growth model.** The general prerequisite for successful economic convergence is a

healthy structure and financing of capital formation and investments (Palotai and Virág, 2016). As a result of a consistently intensive investment activity across companies, households and the state, Hungary's investment rate increased to 27.1 percent by 2019, which is high in historical and international comparison. In that year, Ireland was the only EU Member State with a higher ratio of investments to GDP. Other than the level of the investment rate, the prominent ranking also applies to its movements. Between 2010 and 2019, the Hungarian rate rose by 7 percentage points, which is the second highest growth rate among 54 countries in the world (Chart 1-14). It is noteworthy that only half of the countries covered by the analysis saw their investment rates increase over the previous decade.





The trend change in the credit market was essential for the increase of the investment rate. Following the onset of the crisis, the credit market in Hungary effectively collapsed, and Hungarian-owned enterprises in the SME sector in need of bank financing were hit particularly hard by the scarce credit supply, banks' restrained willingness to lend and rising risk premiums (MNB, 2019). The Funding for Growth Scheme (FGS) launched by the Magyar Nemzeti Bank in June 2013 provided targeted improvements in financing opportunities for the sector. The scheme brought a trend reversal in SME lending, with the credit volume of the SME sector growing at a steady and increasingly dynamic rate from 2015. Tamási and Világi (2011) demonstrate that credit supply is decisive

in the development of economic activity. Reviving the credit market was key in order to provide dynamism for economic growth, with contributions from self-financing, the conversion of foreign currency loans into HUF loans, and the MNB's easing cycle (Felcser et al. 2015; MNB, 2019). It is worth noting that in contrast with global trends, the Magyar Nemzeti Bank eased monetary conditions while tightening the central bank balance sheet (MNB, 2017). The unorthodox tools deployed by the world's major central banks led to a drastic rise in central bank balance sheets, which, while dampening the recession in the acute phase of the crisis, had a progressively diminishing real-economy impact, and increased the risk that asset price bubbles would be formed (Coibion et al., 2014).

Hungarian economic growth was significant even by European standards. After financial rebalancing, economic policy focused on reviving economic growth, which received contributions from tax and labour market reforms as well as from the restart of central bank programmes and lending. After 2013, the Hungarian economy entered a new growth path, with an average annual GDP growth of 3.8 percent between 2013 and 2019, generating an overall increase of nearly 30 percent over the period (Chart 1-15). During this period, the 27 Member States of the European Union entered a new period of boom, however, the rate of GDP growth varied significantly across countries and groups of countries. In the Mediterranean countries, poorly timed fiscal austerity further deepened the recession and increased debt ratios (Frankel, 2015; Matolcsy - Palotai, 2018). Greece's GDP in 2019 exceeded its 2012 level by only 1.7 percent. Meanwhile, the Central and Eastern European region experienced a lively economic activity, and the Visegrad and Baltic countries became Europe's growth engines.



Hungary showed outstanding performance in convergence even by international standards. Between 2013 and 2019, the dynamics of Hungary's GDP growth were on average 2 percentage points higher annually than the average growth of the EU-27 and more than 2.1 percentage points higher than that of the euro area Member States entering sovereign debt crises. As a combined effect of these factors, Hungary converged to the average level of development in the EU at a lively pace. GDP per capita at purchasing power parity, which is used as the most popular indicator of economic development, stood at 66 percent of the EU-27 average in 2010, increasing to 73.2 percent by the end of the decade, ahead of both Slovakia and Poland. Among the countries of the region, a similar degree of convergence took place in Czechia and Poland, while Romania rapidly approached the region from a low level of development (Chart 1-16). Economic convergence in Slovakia stalled after 2015. Before the 2008-2009 crisis, Greece's level of development was close to the EU average, falling to a mere 66.5 percent by 2019. By the end of the decade, as a result of the different growth patterns, each Visegrad country had GDP per capita exceeding that of Greece.





Real economic convergence with retained balance is rare in economic history. In the decade following the 2008-2009 global economic crisis, economic recovery started worldwide, although its degree varied from country to country. Of the 44 countries individually accounting for at least 0.5 percent of US GDP in 2019 (which makes them relevant in international economic networks), only one-half recorded average growth in GDP per capita exceeding that of the USA between 2010 and 2019. Variations are also seen in the degree of convergence: 10 countries recorded growth gaps ranging from 1 to 3 percentage points (including Hungary and the Visegrad region), while Ireland, China, India, Vietnam and the Philippines had average GDP per capita growth rates exceeding that of the USA by more than 3 percentage points (Chart 1-17). As shown clearly by the lessons learned from the 2008-2009 global crisis, besides the rate of economic growth, its structure is also of paramount importance. Of the 22 countries converging to the US as discussed earlier, 11 achieved convergence accompanied by a current account surplus, while only 8 produced a parallel decrease in its gross government debt to GDP ratio over the past decade. Hungary is one of the few countries in the world where both were accomplished simultaneously (Chart 1-18). Apart from Hungary, economic convergence was accompanied by a current account surplus and a decreasing government debt ratio in Ireland, Germany, Israel, and the Philippines. Economic convergence with retained balance that remains sustainable in the long run is a rare phenomenon in the world economy.



Source: World Bank.





The convergence of the past decade is an outstanding success in Hungary's economic history. In Hungary's hundred years since the Peace Dictate of Trianon, periods of economic boom were interspersed with wars, world economic crises and economic policy errors. Examined in terms of decennial averages, Hungary's GDP has shown growth for the most part (Chart 1-19), but the structure and sustainability of that growth vary considerably. Deployed after the end of World War II, the planned economy system was based on full state control, and the development of the heavy industry – without a raw material base. Although the 1950s resulted in the fastest period of economic growth in Hungary as a result of the reconstruction following the World War, the unsustainability of the system was clear from the beginning. In the next decade, vigorous growth continued and was accompanied by an artifi-

cially raised standard of living in the spirit of General Secretary Kádár's economic policy. Inefficient production structures, lack of innovation and unsuccessful reform attempts led to severe external indebtedness. As our history is intertwined with Austria's in many respects, it is reasonable to compare the development of Hungarian economic performance to that of our western neighbour. An analysis of decennial averages shows only three decades in the last century when Hungary's GDP growth exceeded that of Austria (Chart 1-19). Although the socialist planned economy and the 1920s following Trianon generated significant GDP growth, Hungary failed to catch up with Austria in these periods, with Hungary consistently lagging behind its western neighbour in terms of growth in economic performance. In the 1930s, the Hungarian economy experienced a short period of success, and several companies in the country achieved European standards in the fields of electrical engineering instruments (Tungsram, Orion) and mechanical engineering (Weiss Manfréd, Ganz) (Virág, 2020). Compared to the 1930s, convergence has been stronger over the past two decades, but the two periods are significantly different in terms of sustainability.





In the hundred years since Trianon, real economic convergence with retained balance has only been achieved in the last decade. Between 2010 and 2019, the Hungarian GDP growth rate exceeded that of Austria by an average 1.2 percentage points annually, which is the fastest decennial episode of convergence recorded in the past century of Hungarian economic history. That convergence is of paramount importance also because, on the decennial average, it was accompanied by a current account surplus as well as by a decreasing government debt ratio (Chart 1-20), i.e. in a way that is sustainable in terms of financial equilibrium. The same decade saw a meaningful decrease in the net external debt to GDP ratio. No examples are found for convergence with retained balance in any of the preceding decades.





The coronavirus hit a Hungarian economy that was showing lively economic convergence and favourable equilibrium indicators. In recent Hungarian history, the start of previous decades was typically marked by economic challenges. The oil crises of the 1970s and 1980s, the regime change, the burst of the global dotcom bubble and the recovery after the recession in 2010 all prompted economic policy and economic operators to adapt. The 2020s were ushered in by the spread of COVID worldwide and the parallel global economic recession. Hungarian GDP declined by 5 percent in 2020 compared to the previous year. However, the coronavirus crisis is unique for the Hungarian economy. The recession took place against a backdrop of favourable equilibrium indicators that could support a faster recovery. Hungarian household consumption expenditure decreased by only 2.5 percent, at one of the most modest rates in Europe. Consumption in Hungary was also supported by a labour market that remained resilient during the epidemic, financial assets and household savings rising to a high level in the previous years, as well as a credit moratorium the scale of which was one of the widest even by international standards.

The recovery strategy should reflect the challenges posed by the pandemic. The virus hit the sectors at the lead of Hungary's economic growth in the past decade (tourism, investments, vehicle manufacturing) (MNB, 2020b). Early responses to the coronavirus, such as the introduction of border closures and lockdown measures, directly and substantially affected domestic and cross-border tourist traffic. Through the erosion of trust, the pandemic situation may have a longer-term effect on travel habits. The sector may be one of the biggest losers of COVID, with experts suggesting that international tourist traffic is unlikely to return to pre-pandemic levels before 2023 (UNWTO, 2021). Hungary's investment rate continued to increase in spite of the coronavirus crisis. Investment growth has been one of the most important factors of economic growth in recent years. In addition to increasing demand over the short term, investment growth also has a positive impact on the longer term by increasing potential growth through capital formation. In the post-pandemic economic recovery - in line with the growth model of the last decade – investment growth, which is the basis for sustainable economic convergence, must continue to be decisive. In addition to tourism, COVID may also accelerate the transformation of other sectors. The coronavirus has resulted in disruptions along global supply chains, but industrial production has recovered relatively rapidly following the first wave of the pandemic. Within Hungary's economic growth, the importance of the automotive industry has gradually increased over the past decade, which raises the possibility that the transformation of the sector, already underway, may accelerate as a result of the pandemic. The spread of electromobility may be of primary significance in the countries of Central and Eastern Europe, where vehicle manufacturing carries a meaningful weight within GDP.

# 1.3 Empirical study of the 2010–2019 growth period

Hungarian Model 1.0 can be characterised using a number of indicators. As explained in the first section, a number of theories have been and continue to be offered to explain growth, each focusing on a different set of critical factors. Moreover, the factors considered critical keep changing over time. In this section we used a set of 18 different factors affecting the economic growth in the 44 countries covered by the study. The variables used in our analysis and their units of measurement are given in Table 1-1. These factors are apparently sufficient to characterise Hungarian Model 1.0 in terms of growth and to compare it with the growth factors and performance of other countries.

Since our database consists of a large number of interrelated indicators, as a first step we try to combine related variables by performing factor analysis. In order to eliminate cyclical fluctuations, we considered the average of the available data and, where meaningful, its change in the period 2010–2019. All variables were standardised to render them independent of units of measurement.

Table 1-1: The variables involved in the study and their unit					
Variable	Unit				
Gross fixed capital formation	Annual growth				
Productivity	Annual growth				
Research and development expenditure	% of GDP				
Income share held by highest 20%	Change				
Labor force participation rate <sup>1</sup>	Change				
Youth unemployment rate <sup>2</sup>	Change				
Employment rate <sup>3</sup>	Change				
ESA balance	% of GDP				
General Government Debt	% of GDP				
Employer's social security contribution rate	As a percentage of an income equal to GDP per capita, Change				
Employee's social security contribution rate	As a percentage of an income equal to GDP per capita, Change				
Effective personal income tax rate	As a percentage of an income equal to GDP per capita, Change				
Openness	(Exports+Imports)/GDP				
Final consumption expenditure	% of GDP				
Participation in global value chain	Foreign value added/domestic value added (%)				
Maanagerial skills	Questionnaire (1-10) <sup>4</sup>				
Use of big data	Questionnaire (1-10) <sup>4</sup>				
Digital skills	Questionnaire (1-10) <sup>4</sup>				

Note: <sup>1</sup> Among 15-64 year olds, <sup>2</sup> Among 15-24 year olds, <sup>3</sup> Among over 15 year olds, <sup>4</sup> Questionnaire survey result: one indicates the worst and ten the best. Source: IMF, UNCTAD-Eora, WDI.

By performing factor analysis on the correlating variables in our database, we obtained six linearly independent factors<sup>1</sup>. The results of the factor analysis are shown in Table 1-2 and the rotated component matrix<sup>2</sup> in Table 1-3. The first principal component incorporates factors determining technological development (R&D expenditure, managerial skills, big data use, digital skills), with absolute factor loads of more than 0.5. The second factor is dominated

Table 1-2:	Eigenvalues	of factors							
	Initial eig	genvalues			Factor values		Rot	tated factor val	ues
Component	Eigenvalue	Percent of variance	Percent of cumulated variance	Eigenvalue	Percent of variance	Percent of cumulated variance	Eigenvalue	Percent of variance	Percent of cumulated variance
1	3.890	21.610	21.610	3.890	21.610	21.610	3.000	16.670	16.670
2	3.315	18.410	40.030	3.315	18.410	40.030	2.571	14.280	30.950
3	2.328	12.930	52.960	2.328	12.930	52.960	2.515	13.970	44.920
4	1.651	9.170	62.130	1.651	9.170	62.130	2.277	12.650	57.570
5	1.394	7.740	69.870	1.394	7.740	69.870	1.720	9.560	67.130
6	1.206	6.700	76.570	1.206	6.700	76.570	1.700	9.450	76.570
7	0.903	5.020	81.590						
8	0.734	4.080	85.670						
9	0.566	3.150	88.820						
10	0.494	2.740	91.560						
11	0.398	2.210	93.770						
12	0.295	1.640	95.410						
13	0.267	1.480	96.890						
14	0.165	0.920	97.810						
15	0.147	0.820	98.630						
16	0.136	0.750	99.380						
17	0.075	0.410	99.790						
18	0.037	0.210	100.000						
Source: MNB-c	alculation.								

#### Table 1-3: The rotated component matrix

Madakia.			Fac	tors				
variable	1	2	3	4	5	6		
Gross fixed capital formation	0.1657	0.1141	0.2133	0.8095	0.0642	0.0617		
Productivity	-0.1645	0.1221	0.0347	0.8977	0.0798	0.0135		
Research and development expenditure	0.6991	0.1165	0.0752	-0.4063	-0.1163	0.2023		
Income share held by highest 20%	0.2112	0.1759	0.2791	-0.1216	0.1799	-0.5385		
Labor force participation rate	-0.1281	0.8243	0.2016	-0.1817	0.0837	-0.1524		
Youth unemployment rate	-0.0369	-0.7850	-0.0754	-0.3592	0.1612	0.1398		
Employment rate	0.0912	0.8493	0.2273	0.203	-0.1292	-0.1046		
ESA balance	0.2121	-0.1416	0.0015	-0.0842	0.8750	-0.0972		
General Government Debt	0.0844	0.0052	-0.1322	-0.4505	-0.7459	0.0561		
Employer's social security contribution rate	0.2743	-0.2041	0.0249	-0.1064	0.1132	0.5749		
Employee's social security contribution rate	-0.2244	0.3641	-0.4048	-0.2408	0.0963	0.5657		
Effective personal income tax rate	0.1750	-0.1424	0.1365	0.1231	-0.1532	0.7202		
Openness	-0.0173	0.2323	0.9050	0.0743	0.0591	-0.0526		
Final consumption expenditure	-0.1260	0.0234	-0.7774	-0.1736	-0.3983	-0.2584		
Participation in global value chain	0.0912	0.3278	0.8034	0.0891	-0.1890	-0.2229		
Maanagerial skills	0.8472	-0.2978	0.0741	0.1081	0.0845	0.0949		
Use of big data	0.8137	0.0089	0.1077	0.2585	0.2033	0.0223		
Digital skills	0.8793	0.1264	-0.0197	-0.1288	0.0022	-0.0350		
Note: We used varimax rotation with Kaiser normalization.								

Source: MNB-calculation.

Based on the Kaiser criterion, only factors with an eigenvalue of at least one were taken into account. Eigenvalue is the variance explained by the factors by reference to the variance of the original variables. Where a factor's eigenvalue is less than one, it carries less information than a variable, calling for that factor to be disregarded. Our resulting six-dimensional factor space explains 77 percent of the original variable space. This appears to be sufficient, given that in the social sciences 70 percent is a frequently used threshold, and models with a higher explanatory power are considered appropriate.
In order to make the factors easier to interpret, we applied factor rotation, a transformation after which a more visual meaning can be attached to individual factors.

by labour market variables. There is a strong correlation between the activity and employment rates and the factor, while the youth unemployment rate is negatively correlated with the factor. In the third principal component, variables capturing the openness of the economy are regarded as lead variables. There is a strong positive correlation between the ratio of exports and imports to GDP, participation in global value chains and the factor, while the final consumption of households also has a strong load within the factor, with a negative sign. The fourth factor incorporate productivity-related variables (average annual growth in gross fixed capital formation and productivity) with factor loads above 0.5 in absolute terms, qualifying this principal component as the productivity-dominated factor. The last two factors will be named the factors 'dominated by the budget' and 'dominated by cuts in taxes and contributions', on the basis of their variables with high factor loads in absolute terms. Once the factors have been defined, factor point values<sup>3</sup> can be determined for each country, which allows comparing the individual countries along each factor. During our study we found that in three of the six factors obtained previously, Hungary performed best during the period 2010–2019 (Chart 1-21).



Note: The open CEE economy is based on the average of Czech Republic and Slovakia, the large developed economies based on the average of Canada, the United States and the United Kingdom, the northern economies based on the average of Finland, Iceland and Sweden, while the PIGS is based on the average of Portugal, Italy, Greece and Spain. Source: MNB-calculation.

Based on the factor dominated by variables capturing cuts in taxes and contributions, our country showed outstanding performance compared to the other country groups under review. Cuts in labour taxes, comprising part of the tax reform, were implemented at rates that are seen as outstanding among the countries under review. The reform of the tax system also supported economic growth through its impact on the Hungarian labour market. The reduction of taxes and contributions on labour has resulted in a significant increase in the employment rate and the activity rate in Hungary. The values of the factor points dominated by the labour market variables and the variables that capture economic openness are the highest in the case of Hungary. During the period concerned, Hungary was characterised by a higher degree of openness to foreign markets than the average of other country groups, as indicated by higher values for participation in global value chains, the ratio of exports and imports to GDP, and the final consumption of households in proportion to GDP. In terms of openness to foreign markets, apart from Hungary, Baltic states and open Central and Eastern European economies exceed the average of the country groups under review.

Based on the factor dominated by budgetary variables, our country performed slightly above the average. Although the average annual growth in gross fixed capital formation was remarkably high in our country compared to the country groups under review, due to lower productivity growth, Hungary lagged behind the average of the country groups under review based on the factor dominated by productivity variables. Along this factor, the Nordic countries performed similarly to Hungary, while the Mediterranean countries lagged behind us.

Between 2010 and 2019, Hungary's greatest shortfall was recorded along the factor dominated by technological variables. Based on this, going forward technological progress may become one of the fundamental pillars of economic competitiveness in Hungary. Our study clearly shows that while in 2010, similarly to the Mediterranean countries, Hungary was characterised by high debts and an unfavourable economic structure, these factors improved significantly by the end of the decade as a result of the reforms.

Changes in the Hungarian labour market and tax system during the period concerned were more favourable than in other groups of countries concerned. In addition, the Hungarian economy is above average in terms of openness. These constitute the main pillars of Hungarian Model 1.0. At the same time, over the last 10 years, we lagged behind on the variables capturing technological development (R&D expenditure, managerial skills, big data use, digital skills), which will be critical growth factors for the next decade.

#### **1.3.1 RESEARCH ON THE GENETICS OF HUNGARIAN ECONOMIC GROWTH IN 2010–2019**

After determining Hungary's performance in the previous decade and positioning it in the international space, we look for growth patterns in economic history that are

<sup>3</sup> The factor point value is the dependent variable obtained from a linear regression where the explanatory variables are the variables in the factor.
similar to Hungarian model 1.0. In our study, 11 variables from 28 countries were analysed over a variety of 10-year periods, which enabled us to perform a more heterogeneous and in-depth analysis in space and time. The variables included in the study and their units of measurement are shown in Table 1-4. In order to eliminate cyclical fluctuations, once again we considered the average of the available data and standardised them, thereby rendering them independent of units of measurement. As a result of the factor analysis, 4 uncorrelated factors were obtained<sup>4</sup> (Table 1-5). The rotated component matrix is shown in Table 1-6.

### Table 1-4: The variables involved in the study and their unit

Variable	Unit		
Labor force participation rate <sup>1</sup>	Percent		
Unemployment rate <sup>2</sup>	Percent		
Youth employment rate <sup>3</sup>	Percent		
Gross fixed capital formation	Annual growth		
Productivity	Annual growth		
ESA balance	% of GDP		
10-Year Government Bond Yields	Percent		
Current account balance	% of GDP		
Openness	(Exports+Imports)/GDP		
Foreign direct investment	% of GDP		
Participation in global value chain	Foreign value added/domestic value added (%)		
Note: <sup>1</sup> Among 15-64 year olds, <sup>2</sup> % of total labour force, <sup>3</sup> Employment to population ratio, ages 15-24			

Source: OECD, UNCTAD-Eora, WDI

#### Table 1-5: Eigenvalues of factors

	Initial eig	envalues			Factor values		Rot	ated factor val	ues
Component	Eigenvalue	Percent of variance	Percent of cumulated variance	Eigenvalue	Percent of variance	Percent of cumulated variance	Eigenvalue	Percent of variance	Percent of cumulated variance
1	2.758	25.080	25.080	2.758	25.080	25.080	2.668	24.250	24.250
2	2.630	23.910	48.980	2.630	23.910	48.980	2.580	23.460	47.710
3	1.678	15.250	64.230	1.678	15.250	64.230	1.762	16.020	63.730
4	1.212	11.020	75.250	1.212	11.020	75.250	1.267	11.520	75.250
5	0.994	9.030	84.280						
6	0.469	4.260	88.540						
7	0.453	4.120	92.660						
8	0.377	3.430	96.090						
9	0.293	2.660	98.750						
10	0.092	0.830	99.590						
11	0.046	0.410	100.000						

Source: MNB calculation.

#### Table 1-6: The rotated component matrix

Mastahla	Factors				
Variable	1	2	3	4	
Labor force participation rate	0.8790				
Unemployment rate	-0.8323				
Youth employment rate	0.8974				
Gross fixed capital formation				-0.7559	
Productivity				0.7131	
ESA balance			0.7815		
10-Year Government Bond Yields			0.5223		
Current account balance			0.8517		
Openness		0.9209			
Foreign direct investment		0.6589			
Participation in global value chain		0.9434			
Note: We used using use station with Keiser normalization. Only factor weights greater than 0.5 in sheak to value are shown in the table					

Note: We used varimax rotation with Kaiser normalization. Only factor weights greater than 0.5 in absolute value are shown in the table. Source: MNB calculation.

<sup>4</sup> Again, based on the Kaiser criterion, only factors with an eigenvalue greater than one were taken into account. The resulting four-dimensional factor space explains 75 percent of the original variable space.

As a result of our factor analysis, we obtained factors for the labour market, the economic structure, the state, and productivity, which determine economic growth. The first factor incorporates labour market variables with factor loads of more than 0.5 in absolute terms, and is named 'labour market factor' accordingly. The second principal component was named 'economic structure', as the factor loads of the ratio of exports and imports to GDP, and of participation in global value chains both exceed 0.9, and the inflow of foreign direct investments is incorporated with a factor load of 0.66. The next factor incorporates state-related variables (ESA balance, 10-year government debt yield, current account balance), while the fourth factor incorporates productivity-related variables (annual average increase in gross fixed capital formation, annual average increase in productivity) with high factor loads in absolute terms.

We identified specific groups of countries by means of cluster analysis. The dendrogram<sup>5</sup> produced by means of the variance method as part of hierarchical clustering is shown in Chart 1-22. Cluster analysis classified the countries under review into four groups. The grouping is shown in Table 1-7.

Hungary's economic performance between 2010 and 2019 was highly similar to the Latvian model of 2010–2019, to the Swedish, Czech, Belgian and Austrian models at the turn of the millennium, and to the Czech, Lithuanian, Slovenian and Irish models of the first half of the 2000s and the first half of the 2010s. During these periods, these economies were characterised by high degrees of openness. The ratio of exports and imports to GDP, inflows of foreign direct investment and participation in global value chains were higher than the average of other countries. In these countries,



#### Table 1-7: Groups of countries based on cluster analysis

First group	Second group	Third group	Others
Hungary 2010–2019	Australia 1983–1992	Australia 2001–2010	Russian Federation 1995–2004
Belgium 1998–2007	Canada 1983–1992	Iceland 1991–2000	South Africa 1994–2003
Austria 1998–2007	Germany 1988–1997	New Zealand 2001–2010	South Africa 2006–2015
Sweden 1993–2002	Australia 2010–2019	Canada 1994–2003	Spain 1988–1997
Czech Republic 1994–2003	United States 1999–2008	Mexico 1998–2007	
Czech Republic 2004–2013	Japan 1988–1997	Iceland 2010–2019	
Latvia 2010–2019	United States 1988–1997	Denmark 1994–2003	
Lithuania 2006–2015	Canada 2005–2014	Sweden 1999–2008	
Slovenia 2002–2011	United Kingdom 1999–2008	Netherlands 1994–2003	
Ireland 2001–2010	Iceland 2001–2010	Netherlands 1999–2008	
	Chile 2009–2018	Norway 1995–2004	
	Israel 2001–2010	Russian Federation 2006–2015	
	Mexico 2010–2019		
	Portugal 1995–2004		
	Spain 2000–2009		
	Greece 1992–2001		
	Greece 2000–2009		
Commenter la			-

Source: MNB-calculation.

5 The hierarchical algorithm searches for new clusters based on previously formed groups. When applying the variance method, two clusters are merged so as to produce the smallest increase in internal variance. the state factor exceeded the average. The average 10-year government bond market yield (4.5 percent) was the lowest here. Although for countries in the third group, both ESA balance as a share of GDP and the current account balance were positive on average, the lowest average ESA deficit was recorded for countries in the first group, which included Hungary, and the current account deficit as a percentage of GDP, was also the lowest in these countries. The annual average increase in productivity is the highest in this group of countries, while the annual average increase in Hungary's gross fixed capital formation (5.1 percent) exceeds the average of all groups. Based on the labour market factor, these countries performed similarly to the average of the other group of countries.

Sweden's economic performance at the turn of the millennium was similar to that of Hungary during the 2010–2019 growth period. Both countries were characterised by low unemployment, a current account surplus,

and disciplined fiscal policies. Following the burst of the housing bubble blown from the second half of the 1980s, the Swedish economy faced a serious financial crisis in the early 1990s. In 1991, the tax system was reformed by introducing a lower marginal tax rate and corporate tax rate, as well as a more uniform taxation of different types of income. In addition to the more favourable tax system, other factors supported Swedish economic growth in the period under review. Swedish companies discovered the benefits of globalisation early on, thereby benefiting from stronger growth in global demand. They also put great emphasis on investment in research and development. Sweden's R&D expenditure as a percentage of GDP exceeded 3 percent as early as in the 1990s. The average annual growth in gross fixed capital formation was around 6 percent in the second half of the 1990s. Stricter competition laws and accession to the European Union in 1995 stimulated productivity growth in the country through international trade (McKinsey Sweden, 2012).

#### Box 1-1: Methodological overview of factor and cluster analysis

**Factor and cluster analysis are effective tools for multivariate analyses.** Multivariate analysis often involves interrelated and correlated variables that cannot be used efficiently at the same time, which makes dimension reduction a reasonable first step. Factor analysis is a two-step dimension-reduction process designed to reduce the number of variables used in the study by identifying, instead, latent variables and unrelated factors that cannot be observed directly.

During factor analysis, in order to break down the variance of the original database, it is first necessary to produce factors, also known as principal components. The semantic content of latent variables can be inferred by means of factor loads, which show the strength and direction of the correlation between each variable and the given factor. Variables with higher factor loads in absolute terms are considered to be lead variables within the factor. For example, if variables related to the labour market (e.g. unemployment rate, employment rate, activity rate, etc.) dominate within a factor (i.e. are incorporated with the highest factor loads in absolute terms), that factor can be considered as a labour market factor.

Once the factors have been determined, the database variance is broken down using the factors, where the regressors are the principal components obtained previously. Obviously, the greater the number of factors applied, the less information is lost from the original database. Above a certain number of factors, however, it is no longer reasonable to introduce additional principal components, since their presence would only marginally increase the part explained by reference to the variance of the original variables. There is no single generally accepted method for determining the number of factors to be used, which is customarily determined on the basis of criteria that vary across studies.

Once the factors have been determined, the elements of the database can be divided into different groups using cluster analysis. This is a procedure that classifies similar elements into the same group, also referred to as a cluster, based on the variables included in the analysis (which may also be factors). Elements in the same cluster are similar according to some dimension, while they differ along that dimension from elements in another group. Similarity is determined based on the distance between two elements, using some measure of distance.

The grouping of the elements of the database is represented graphically in the dendrogram, allowing interpretations of the groups created using cluster analysis. The dendrogram is a tree-type diagram where the distance between the individual elements is represented by the height of cluster connections. The more similar the elements of the two clusters are, the lower the level at which they are connected.

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## 2 On the economic crisis caused by COVID-19

Compared to previous crises, the emergence and rapid spread of the coronavirus caused a steeper and deeper decline in economic performance. Several of the world's major economies recorded the largest GDP decline in their history in the second quarter of 2020, due primarily to the coronavirus, to the restrictions imposed to control it, and to the severe and large-scale loss of confidence. Among the countries of the European Union, the extent and structure of economic downturn varied considerably by country and country group. The economic downturn in Scandinavia, the Baltic States and Poland was more modest, while the southern countries experienced a major recession and were hit hard as international tourism ground to a halt. Hungary's performance was similar to that of Central and Eastern Europe, a group in close economic integration with Germany.

In 2020, the Hungarian economy contracted by 5.0 percent, which was average within the European Union, but the fifth largest downturn over the past hundred years. As a result of the relatively mild adjustment in the Hungarian labour market and the favourable balance position of the household sector, the decrease in household consumption was the fifth smallest in Europe, due in part to sustained lending and the moratorium. The increased household savings rates observed in a wide range of countries represent a reservoir for future growth. At the same time, it is important to note that only a part of the increase in the savings rate resulted from forced savings, and future developments in savings triggered by greater caution will depend on the effect of the recovery on confidence. If the caution and risk aversion seen in household consumption as a result of the coronavirus were to stabilise at a high level, the result may be slower consumption growth and therefore less dynamic recovery. The economic crisis caused by the coronavirus pandemic had an uneven impact on the economic sectors and industries. The contrast in the performance of services and industry became apparent in Hungary, as well as in the rest of world economy from the second half of the year.

The first wave of the coronavirus pandemic and the consequent rapid deterioration of business and financial prospects required urgent intervention from many countries and central banks around the world. Monetary and fiscal policy provided a response of unprecedented consistency. To compensate for the economic downturn, governments embarked on a fiscal stimulus effort which had not been seen since the global financial crisis and resulted in a significant increase in public debt. As a result of the economic crisis caused by the coronavirus, the globally important central banks introduced a number of supporting actions that increased central bank balance sheets significantly compared to previous levels. This expansion was driven primarily by large-scale asset purchase and loan programmes and other liquidity-providing instruments. Following its introduction, the payment moratorium provided significant support to the liquidity position of actors of the real economy. Dynamic credit expansion was accompanied by the sustained health of the financial system, and the ratio of non-performing loans also remained low.

Compared to the most recent crisis, the signs for the start of an economic recovery in 2021 are much more favourable. The pace of recovery after the 2009 global financial crisis was substantially curtailed by the fact that the financial system was severely damaged and household balance sheets had built up significant leverage, in many cases in unhealthy structures (foreign currency loans). By contrast, the recovery from the economic recession caused by the coronavirus is improved by the preserved integrity of the financial system, continued lending, and most production capacities remaining sound throughout the crisis. Global economic prospects improved as vaccines became available in increasingly large quantities and vaccination coverage rates increased. Also in terms of its speed and structure, recovery depends to a large extent on the lifting of epidemiological measures, and thus, indirectly, on the progress of vaccination programmes.

# 2.1 Economic situation and international comparison

**Compared to previous crises, the emergence and rapid spread of the coronavirus caused a steeper and deeper decline in economic performance.** In the estimate of the International Monetary Fund, the performance of the global economy declined by 3.3 percent in 2020. The 2009 downturn was more modest at a mere 1.7 percent. According to the database the World Bank has kept since 1961, these two are the only cases when the world's aggregate GDP ever contracted.

In modern history, the Spanish flu of 1918-1920 was the only health shock that triggered a global economic crisis event similar to the current crisis. Although the nature and economic mechanism of action of the SARS outbreak, a relative of COVID-19, was only slightly different from the current phenomenon, the 2003-2004 epidemic was much more effectively controlled, and, consequently, resulted in a much lower number of cases. By contrast, the spread of the Spanish flu, considered to be the largest health disaster of modern times, could not be prevented, especially as World War I was still in progress at the outbreak of the epidemic, mobilising significant masses of people. The Spanish flu claimed some 40 million lives, 2.1 percent of the population at the time. The epidemic broke out in 1918, the last year of World War I, spread in three major waves and lasted until 1920. Like the coronavirus, the Spanish flu was a virus transmitted by respiratory tract infection, against which no effective treatment was available during the epidemic, just as during the first wave of the coronavirus. Even in developed countries, the mortality rate reached 1 percent of the total population. It is estimated that up to half a billion people may have been infected. By contrast, the current epidemic claimed 0.04 percent of Earth's population by early May 2021.

Deaths associated with the Spanish flu generated significant costs for the real economy. According to Barro et al. (2020), the mortality rate of 1 percent caused an average decrease of 2.7 percent in real GDP and 4.4 percent in consumption during the 1918–1920 Spanish flu. That said, the impact proved to be temporary, as GDP levels recovered already in the average of the four years following the outbreak, while the impact on consumption remained more lasting, its recovery taking around eight years on average. In 2020, GDP declined in 166 countries in the world, which illustrates the global scale of the crisis (Table 2-1). According to the World Bank, during the most recent major global crisis, in 2009, the economies of 98 countries contracted, whereas in 1991,

when the countries of the former Soviet bloc first came into direct contact with the market economy, gross domestic product decreased in 55 countries. The economic crisis caused by the coronavirus brought about a recession of a scale unseen in the previous 70 years, with characteristics that differed from the "usual" crisis patterns of the past. The downturn did not result from either the cyclical nature of the economy or from internal imbalances, but from restrictions on the movements of people and on social contacts. The epicentres of the crisis were sectors that were heavily exposed to restrictions (i.e. external shocks to the economy) and not the sectors affected by economic and financial problems (such as the financial sector in 2008). Of increasing prominence in the world economy, the services sector was heavily affected, which added to the severity of the crisis.

## Table 2-1 : Number of countries experiencing recessionin the last 70 years

Year	Global GDP growth	Number of countries experiencing recession
2020	-3.3	166
2009	-1.7	98
1991	1.4	55
1982	0.4	50
1992	1.7	50
1993	1.5	48
1983	2.4	46
1990	2.9	43
2012	2.5	43

Source: MNB based on IMF and World Bank data.

Several of the world's major economies recorded the sharpest downturn in their history in the second quarter of 2020, due primarily to the coronavirus, to the restrictions imposed to control it, and to the severe and large-scale loss of confidence. The high share of services in employment and the changes in consumption patterns exacerbated the negative economic effects. As a result of globalisation, economies, production networks and financial systems became deeply integrated over the past decade, which produced much more pronounced ripple effects during last year's crisis (Fujita and Hamaguchi, 2020). The general loss of confidence caused a major slowdown in domestic and international economic activities. In 2020, global exports decreased by a rarely seen 7.5 percent, a rate which, since 1980, has only been exceeded in 2009 and 2015. However, the intra-year dynamics of world trade show an even sharper decline: according to the Dutch Centraal Planbureau (CPB), by May 2020 the volume of world trade fell by 14 percent compared February 2020, down to its 2011 level, in a decline of a magnitude second only to that seen in 2009 (-22 percent). In the second quarter of 2020, EU GDP declined by 13.8 percent and that of euro area Member States by 14.6 percent. Prior to that, the greatest decline occurred during the 2008–2009 crisis, in the first guarter of 2009, when a year-on-year contraction of 5.3 percent was registered for the EU, and 5.6 percent for the euro area. In the USA, the financial crisis bottomed out in the second quarter of 2009, when GDP declined by 3.9 percent, whereas in the second quarter of 2020 gross domestic product declined by 9 percent. Overall, the economies of only a handful of countries managed to grow in 2020. The majority of these have services sectors with a low added value, and are typically developing countries. Of the world's major economies, only China, and in the developed world only Taiwan and Ireland were able to sustain GDP growth year on year. Some Asian countries owe their success to extremely rapid and effective disease control.

Overall, the Hungarian economy contracted by 5.0 percent in 2020, which is the fifth largest economic downturn over the past hundred years. Sharper declines in Hungarian GDP were only recorded in the years following the regime change (1991), in 1940, and in 2009 (Table 2-2). At the same time, the economic crisis caused by the coronavirus is the second most significant when compared to the pre-crisis growth trend. This also shows that the 2020 crisis hit without any precedent and interrupted a healthy growth path.

Table 2-2: The deepest economic recessions in Hungaryduring the last decade					
Crisis	Decline in GDP	Pre-crisis average GDP growth (3 year average)	Difference from pre-crisis trend		
1991	-11.9	-2.5	-9.4		
1940	-6.8	3.5	-10.3		
2009	-6.7	1.8	-8.5		
1990	-6.7	0.3	-6.9		
2020	-5.0	4.8	-9.8		
1931	-4.8	3.3	-8.1		
1956	-4.5	4.8	-9.3		

Note: Based on recessions exceeding 4.5 percent. Difference from pre-crisis trend calculated from the average growth of 3 years before the crisis. Source: MNB, based on Maddison (2018) and Eurostat.

Within the European Union, a variety of patterns could be observed in economic performance (Chart 2-1). Hungary's performance was similar to that of Germany and the countries of Central and Eastern Europe, which are closely integrated into the German supply chains, mostly in the automotive industry. The economic downturn in Scandinavia, the Baltic States and Poland, as well as in the northern Balkans, was more moderate at around 3 percent, mostly supported by favourable investment performance. The economic downturn in the southern countries was significant, due in part to the high weight of tourism, and in part to the increase in forced savings.

Chart 2-1: Annual changes of GDP in 2020 across the EU



In addition to the variety of patterns, another common feature that can be observed is that the restrictions had a more significant effect on economic performance in the first wave of the epidemic than during the second wave. This phenomenon was particularly remarkable in the development of industrial production. In the second quarter of 2020, among others, operators in vehicle manufacturing, the largest Hungarian industrial subsector, recorded huge losses due to forced factory closures and reduced production, but proved to be much more resilient during subsequent waves. This is one of the reasons why, during the second wave, economies outperformed expectations despite relatively stringent epidemiological measures (Chart 2-2). As Hungary was approximately on the trendline during both waves, the effect of domestic measures appear to have had an average impact on the country's economy.



Note: First wave: Q2 2020, second wave: Q3-Q4 2020. GDP changes calculated based on seasonally and calendar adjusted data. Source: Eurostat, Oxford University.

### 2.1.1 DEVELOPMENTS ON THE DEMAND SIDE OF GDP

Due to the forced savings caused by a series of lockdowns and to increased caution, household consumption expenditures decreased significantly by about 7.4 percent in 2020. Southern countries, which account for more than 40 percent of EU GDP, are largely situated in the second half of the EU ranking, along with Austria and Slovenia (Chart 2-3). Within the Community, the fall in household consumption was the sharpest in Italy and Spain. In both the euro area countries and the United States, the greatest impact on economic performance was a result of the decline in household consumption expenditure.



## Chart 2-3: Households' expenditure on consumption (2020)

In Hungary, household consumption was relatively resilient, with the sixth smallest decline among the EU countries. The relatively favourable performance of consumption was attributable to the fact that the labour market adjustment was smaller compared to the 2009 global economic crisis, with contributions from the sustained functioning of loan markets, the loan repayment moratorium as well as the Government's job protection measures (wage subsidies). Bulgaria posted an increase in households' consumption expenditures, a unique development in Europe.

The structure of consumption expenditure reflected the specificities of the virus situation. During the 2008–2009 financial crisis, the greatest fall was seen in the demand for durable goods, whereas in 2020, in line with lockdown measures, the sharpest decline was in the consumption of services (Chart 2-4). In the course of the current crisis, financial systems functioned essentially without disruptions, whereby consumption expenditure decreased not because of a drastic deterioration in the financial positions of households (which tends to be accompanied by cutbacks on the purchases of durable goods) but because of restrictions (the consumption of services was most likely to be in breach of epidemiological regulations).



Last year, Hungary saw a major decline in investments. The extent of the decline was approximately the same as the European Union average, and was more favourable than the Czech and Slovak rates. While cutbacks on investment are a common phenomenon in crisis situations, a dynamic expansion was seen in Estonia and Romania in 2020. Investment volumes rose by 18 percent in Estonia and by 7 percent in Romania, despite the economic recession triggered by the coronavirus.

In spite of the decrease in the volume of investments, the Hungarian investment rate remained at the forefront (Chart 2-5). After Estonia and the traditional front-runner Ireland, Hungary's investment rate was the third highest in the EU (27.3 percent). In most sectors, the fourth quarter made up for some of the investments postponed during the first three quarters. The process was significantly supported by the dynamic 9 percent increase in corporate lending despite the crisis, partly due to the central bank's economic stimulus schemes.



In addition to investments, Hungarian exports also fell by 6.8 percent compared to 2019, while imports fell by 4.4 percent. As a result of border closures and factory shutdowns, the performance of foreign trade across Europe declined sharply in the second quarter. However, a duality could be identified in the structure of exports during the year. In parallel with the resumption of industrial production, a correction in goods trade took place in the second half of the year, but service exports remained subdued due to the disruption of international tourism. Hungarian export performance was positioned in the middle of the European ranking. Within the EU, the Benelux, the Baltic and Scandinavian countries performed well in terms of exports, while southern countries lagged behind as a result of the decline in tourism.

In 2020, the decrease in Hungary's government consumption was the third largest in a European comparison. Community consumption consists of social transfers in kind (e.g. education, healthcare) received from the government, in almost equal weight, as well as Community consumption in the narrow sense (e.g. public administration, defence and law enforcement). The added value of healthcare fell sharply (mainly in the second quarter) as a result of the radical reduction in doctor-patient encounters in the first wave (postponement of non-essential interventions), which, in combination with sports and cultural services, which suffered major losses, determined the performance of total government consumption.

After a significant fall in the spring, export of goods returned to its previous growth trend already by the end of the year, whereas a prolonged and slow recovery is expected for foreign trade in services. Southern countries, which tend to rely more extensively on tourism, typically experienced larger declines in exports in 2020 than those with a lower contributions of the sector (Chart 2-6). Hungary's position can be considered average. According to experts, the recovery of international tourism may take years, with some estimates concluding that the sector might reach its pre-crisis level only after 2023 (UNWTO, 2020).







The Hungarian recession caused by COVID-19 differs significantly from the 2009 crisis in terms of both shape and composition (Chart 2-7). In the second quarter of 2020, at the height of the crisis, the greatest contributions to the economic downturn were from net exports (-7.7 percentage points) and household consumption (-4.9 percentage points), while the impact of changes in inventories was positive. By contrast, in the 2009 crisis, net exports made a positive contribution to economic performance in all quarters when there was a downturn. Looking at the whole of 2020 and 2009, we can also see a stronger decline in domestic demand items in 2009, while to some extent, net exports were able to offset this (owing to the fact that imports fell even more than exports due to the weak performance of domestic demand items). Another important factor is the fact that stockpiling was overall positive in 2020, which shows that the nature of the crisis brought attention to the vulnerability of strained inventory management systems.



As a combined result of a healthier economy and an undamaged financial system, Hungary experienced a more modest decline in 2020 than in 2009. During the epidemic, the previously strong sectors remained the best performers in the Hungarian economy. The credit market, tax cuts, consumption, the performance of large corporations capable of exports, and central bank stimulus remained at the forefront in a European comparison, allowing for a somewhat cushioned negative impact of COVID-19.

### 2.1.2 HOUSEHOLDS' SAVING RATE INCREASED DURING THE 2020 CORONAVIRUS CRISIS

Households' financial savings rate increased significantly due to both caution and forced savings (Chart 2-8). As a result of the measures taken to control the spread of the virus and due to increased caution, the consumption rate fell to a level unseen since 2000, while the financial savings rate increased significantly.



The increased retail savings rate represents a future growth reserve. At the same time, it is important to note that only a part of the hike in the rate resulted from forced savings, while another part resulted from increased caution, the future development of which is characterised by uncertainty. If the caution seen in household consumption as a result of the coronavirus were to remain, the result may be slower consumption growth and therefore less dynamic recovery. On the other hand, the distribution of savings is a key factor. The concentration of savings in wealthier families represents a smaller reservoir for growth compared to savings distributed more evenly across various segments of society. The increase in the saving rate is a common phenomenon in the coronavirus crisis. The increase in Hungary's savings rate is not outstanding by international standards, but the Hungarian indicator started from a relatively high base before the crisis, whereby the rate corresponds to the EU average (Chart 2-9). The mobilisation of savings in our export markets is expected to create demand for Hungarian exports.





Note: Percentage point change compared to the previous year. Source: Eurostat, HCSO, MNB calculations.

#### 2.1.3 DEVELOPMENTS ON THE OUTPUT SIDE

Due to the coronavirus and restrictions, the services sector made the largest contribution to the decline in GDP in 2020. Significant differences in the performance of services can be identified among European countries (Chart 2-10). In the case of the Baltic and Nordic countries, as well as Poland, services declined more moderately, while the southern countries suffered a significant decline, being harder hit by the virus and the shutdown in tourism. In an international comparison, the performance of the Hungarian services sector (-4.7 percent) was slightly below the regional average but developed more favourably than the EU average. In Hungary, among the services IT and financial services managed to grow in 2020.



The decline in industrial production was explained by both supply-side and demand-side factors. Last year, in addition to the initial temporary factory shutdowns triggered by health risks, the performance of the sector was influenced by both supply chain disruptions and falling demand (Baldwin and Freeman, 2020). In the world's industrial production, the first economic impacts of the coronavirus emerged in China. Abrupt factory shutdowns and lost production disrupted global supply chains, also affecting Europe, including Hungary. Industrial performance improved in the second half of the year, but the global semiconductor shortage, continuing into 2021, points to disruptions in supply channels. Developments in its industrial added value rank Hungary in the middle of the range in the EU, representing better performance compared to Germany, Slovakia and the Czech Republic, which are also deeply integrated in the automotive supply chains (Chart 2-11). The Baltic States and Poland tended to outperform the average due to their different industrial structures. The poorest industrial production data were registered in the southern states most affected by the virus (Italy, France).



The added value of construction in Hungary showed the fifth largest decline in the EU due to contractions in public orders and corporate investment (Chart 2-12). The sector's performance varied across the EU: while Romania, Greece and Estonia recorded dynamic expansion, a significant decrease was seen in the added value of the construction sector in Slovakia, France, Spain, Ireland, and also Hungary. The performance of the Hungarian construction industry is qualified by the fact that its output increased significantly in the years preceding the coronavirus outbreak. The last expansion similar to the growth dynamics of 2017-2019 occurred in the early 2000s. Simultaneously, the sector started to become overheated. Prices rose by more than 10 percent in both 2018 and 2019. The phase-out of preferential housing VAT in 2020, the loss of public investments at the beginning of the year, and the increase in uncertainty caused a sudden retrenchment in expenditure.



Note: F sector accoring to TEÁOR classification. Based on seasonally and calendar adjusted data.



The economic crisis caused by the coronavirus pandemic had an uneven impact on economic sectors (Chart 2-13). Industry suffered severe losses due to the sudden disruptions during the first wave and the resulting factory shutdowns, but the sector proved to be significantly more resistant to subsequent waves of the pandemic. In the fourth quarter, although to a small extent, industry was already able to make a positive contribution to economic performance. By contrast, services requiring the personal presence of consumers, and above all international tourism, were more exposed to epidemiological restrictions. The performance of the services sector, representing a high share of GDP, temporarily improved over the summer thanks to more relaxed restrictions, but deteriorated again in parallel with the second wave, thus falling overall by 4.7 percent from 2019 and contributing -2.7 percentage points to GDP year on year.



# 2.2 Adjustment in the labour market

Shortly after the emergence of the coronavirus outbreak, companies were also forced to adjust in the labour market. Typically, adjustment has multiple channels: where redundancies occur, a more sustained deterioration in profitability is expected, while shortened working hours imply a shorter-term, temporary drop in corporate profit.

Reduction in employment due to the pandemic and containment measures did not result in immediate, large increase in the unemployment rate. Thanks to the use of statistical methodology, a major share of job losses temporarily increased the number of inactive people instead of the unemployed. As a result of this phenomenon, the unemployment rate peaked in May and reached an average 4.2 percent in 2020. Despite the increase, Hungarian unemployment can still be considered low in international comparison.

Looking at the change in employment per unit of GDP change (Okun parameter), it is apparent that the labour market adjustment registered at the time of the 2020 downturn was moderate compared to 2009. Slight labour market adjustment may provide an important basis for recovery. This will be discussed in more depth in Chapter 4 of the Growth Report.

During the coronavirus pandemic, the labour market proved resilient. The degree of layoffs was significantly mitigated by the well-functioning credit markets, the moratorium and the wage subsidies. In the event of a downturn in the economy, it is of paramount importance that the labour market does not suffer permanent employment losses, which would further slow down the recovery. Supporting the preservation of jobs, economic policy has steered the Hungarian private sector towards the reduction of working hours, a typical measure in most European countries. As of the beginning of 2021, the sectoral wage subsidy was used for almost 100,000 employees, most of whom work in the field of accommodation and hospitality.

## 2.3 Crisis management: reactions from fiscal and monetary policy

The first wave of the coronavirus pandemic and the consequent rapid deterioration of business and financial prospects required immediate intervention from many countries and central banks around the world. Most crisis management tools were already established during the 2008–2009 and earlier crises, but some new factors have emerged. The sectors most affected by the epidemic were granted special assistance, in particular healthcare and sectors with the greatest losses of income (tourism, catering, hotel industry, transport, etc.), complemented by labour market measures to compensate for losses of work or income. Another important new development is closer coordination between monetary and fiscal policy, which was not prevalent during previous crises. In some countries, central banks also took recourse to the tool of sovereign debt purchases, previously considered a taboo. The Fed, the

ECB and the central banks of developing countries, including the MNB, implemented a number of stimulus measures. The major central banks resumed their bond purchase programmes used during the previous crisis, and the smaller central banks followed suit. In addition, to compensate for the economic downturn, governments embarked on a fiscal stimulus effort which had not been seen since the global economic crisis. In most countries, payment moratoria, public wage supplements in the most affected sectors and, in some cases, other public benefits were sought to provide for financial stability. This triggered significant increases in public debt. In 2020, Hungary's general government deficit amounted to 8.1 percent of GDP, while the debt-to-GDP ratio rose from 65.5 percent to 80.4 percent.

## 2.3.1 FISCAL POLICY AND RISING PUBLIC DEBT

The coronavirus pandemic hit the world economy in a weakened state, but its impact did not only affect its malfunctioning parts. Even companies with healthy financial conditions saw their sales reduced to a fraction in a matter of days. The situation prompted the public to expect a solution primarily from the state. Accordingly, apart from the acceleration of current megatrends, a further increase in the role of the state may be an important consequence of the current crisis, amid more pronounced calls for the state to increase its engagement (Tcherneva, 2018; Kelton, 2019). Apart from taking the measures required to protect the economy, the state may participate more actively in the regulation of the market in the future, and may also take a leading role in long-term, high-risk projects and innovations (Mazzucato, 2015).

With its fiscal stimulus, the US stands out among the countries: the Consolidated Appropriations Act and the additional USD 900 billion package adopted at the end of 2020 provided support to households, the unemployed, small businesses and schools, in consequence of which the disposable income of households increased by 11 percent in real terms in January 2021, most of which went to savings (OECD, 2021). At the beginning of 2021, the US administration decided to deploy another USD 1,900 billion (8.5 percent of GDP) fiscal stimulus under the American Rescue Plan. This package also focuses primarily on households, but a smaller part is specifically aimed at helping small and medium-sized enterprises and large companies most affected by the pandemic. According to estimates, this fiscal impulse may increase US GDP growth by 3 percentage points in 2021 and by around 0.5 percentage points in 2022, enabling it to reach pre-pandemic levels as early as mid-2021 (European Commission, 2021). Households with low liquidity will presumably spend benefits on consumer goods quickly, while others increase their savings. The packages with an overall immediate effect of significant economic stimulus will also have an impact on the world economy. The rise in US households' disposable income is accompanied by an increase in their demand for foreign products, which, according to the European Commission (2021), could increase the EU's annual GDP growth by 0.3 percentage points in 2021 and 0.2 percentage points in 2022. The measures also have significant implications for inflation.

Given the scale of the economic damage caused by the pandemic, the European Commission has temporarily authorised Member States to disregard fiscal rules. The costs of controlling the pandemic, the resources needed to restart the economy and tax revenues falling as a result of the crisis presaged sharp increases in budgetary deficits. Some countries in the European Union already had significant levels of debt before the crisis, which continued to rise as a result of the economic recession caused by the coronavirus.

The domestic accrual-based public sector deficit in Hungary was 8.1 percent of GDP in 2020. The economic slowdown, the costs of controlling the coronavirus pandemic and the measures of the Economy Protection Action Plan all contributed to the 2020 deficit. The fall in economic activity reduced planned tax revenues, while fiscal measures provided the economy with significant additional funding, thereby stimulating the decelerating growth and resulting in countercyclical fiscal policy. Deficit data for 2020 are slightly higher than average in a regional and international comparison. The deficit amounted to 6.9 percent on average for the European Union and almost 7.5 percent for the countries of the region in 2020. In all EU countries, budgetary deficits that were substantial compared to previous years led to an increase in debt-to-GDP ratios. Hungary remains in the middle of the range, with public debt at 80.4 percent of GDP, i.e. more than 10 percentage points below the EU average at the end of 2020 (Chart 2-14).



### 2.3.2 BENEFITS OF THE LOAN MORATORIUM

The Hungarian moratorium is an economy protection measure that counts as wide-ranging and long-lasting even by international standards. The introduction of payment moratoria was a generally applied tool in the European Union. With the exception of the Scandinavian countries, some forms of moratorium on payments were introduced almost everywhere. However, there are a number of differences in the details of the measures introduced. In many countries, access is not automatic but based on applications, and in some cases repayments may only be suspended if certain conditions are met (such as unemployment, or operations or employment in an industry exposed to the pandemic).

The steadily high level of participation in the Hungarian moratorium was partly due to automatic access. The popularity of the payment moratorium is indicated by the fact that upon the launch of the programme in March some 1.6 million household debtors and 50,000 corporate clients availed themselves of the payment moratorium. In December 2020, household loans outstanding under the moratorium accounted for 54 percent of the eligible loans extended until 18 March 2020, whereas the moratorium covered 39 percent of corporate loans outstanding.

The payment moratorium provided significant support to the liquidity position of the actors of the real economy. According to our estimates, as a result of the payment moratorium, in 2020 household and corporate debtors may retain excess liquidity amounting to 3.6–3.8 percent of the 2020 GDP, contributing to the mitigation of the risks posed by the pandemic to financial stability and to the real economy. Extension of the payment moratorium until 30 June 2021 is estimated to leave an additional 1.9–2.1 percent of 2020 GDP with real economy actors (MNB, 2021b).

The annual growth rate of the domestic retail loan book was 14.5 percent in 2020, which qualifies as an outstanding dynamic in international comparison (Chart 2-15). The moderating effect of the payment moratorium on repayments and state-subsidised loans continue to play a major role in the high growth rate of lending compared to the 2009 crisis. In other EU Member States, the growth rates of lending to households were either single-digit or negative. Hungary's growth was followed by Belgium and Luxembourg with credit dynamics of 9.2 and 8.3 percent respectively, then by Bulgaria with a rate of around 7.6 percent. In several countries, developments in lending were less favourable compared to the 2009 crisis. In the case of Ireland, the 4.7 percent decrease in 2020 was practically the same as in 2009.





The annual growth rate of the Hungarian corporate credit portfolio was 9.4 percent in 2020, which is the fourth highest value in the European Union, and is also significantly better than what we experienced in 2009 (-5.3 percent). EU Member States show a high degree of heterogeneity in terms of the growth rate of corporate lending, ranging from 13.3 percent annual growth in France to almost the same amount of decline in Lithuania (Chart 2-16). Hungary's expansion is much faster than the annual dynamics of the other Visegrad countries.

![](_page_51_Figure_1.jpeg)

Dynamic credit expansion was accompanied by a strong balance sheet of the financial system, and credit risks were also lower than during the previous crisis. In the fourth quarter of 2020, partly due to the impact of the moratorium, the ratio of non-performing loans (NPL ratio) was only 3.3 percent, ranking Hungary in the middle of the European range. Banks' liquidity and capital positions are also robust, and the sector's shock-resistance would be adequate even in a more severe stress scenario. In terms of credit risks, it is a positive development compared to the previous crisis period that the indebtedness of households and companies is low even in European comparison, and the loan portfolio outstanding is also of much better quality, with around 70 percent of household lending already disbursed to borrowers complying with the MNB's debt brake rules. The central bank estimates that the coronavirus pandemic has resulted in a substantial increase in credit risk for 12 percent of corporate loans and 10 percent of household loans, but that the NPL ratio of private sector loans may remain a single-digit figure even after the moratorium is phased out.

#### **2.3.3 CENTRAL BANK BALANCE SHEETS**

As a result of the economic crisis caused by the coronavirus, the globally important central banks introduced a number of supporting measures that increased central bank balance sheets significantly compared to previous levels (Chart 2-17). In response to the crisis triggered by the pandemic, central banks tended to cut their base rates, increased the volume of their repo tenders, expanded their ongoing asset purchase and credit programmes, and decided to launch new programmes. The supporting actions have resulted in significant expansions in central bank balance sheets, representing increases amounting to 16–26 percentage points of GDP in the globally important central banks concerned (European Central Bank, Federal Reserve, Bank of England, Bank of Japan). The largest balance sheet expansion can be observed in the case of the Japanese central bank, which has increased its balance sheet by almost 26 percentage points since January 2020.

![](_page_51_Figure_6.jpeg)

![](_page_51_Figure_7.jpeg)

This expansion was driven primarily by large-scale asset purchase and credit programmes and other liquidity-providing instruments. In response to the crisis situation triggered by the coronavirus, central banks deployed a broad spectrum of their monetary tools. Balance sheet expansions were, in particular, attributable to asset purchase and credit and liquidity-providing programmes, while the effect of "miscellaneous" items was mostly marginal.

Central bank measures taken in response to the coronavirus outbreak caused sharp increases in the balance sheets. One of the most decisive elements of the monetary policy measures were asset purchase programmes, complemented by a variety of credit and liquidity-providing programmes. Some of the central bank programmes introduced last spring have already been phased out, but central banks continue to maintain most of their supporting measures, which may lead to further increases in central bank balance sheets in the future.

Note: The balance sheet total-to-GDP ratios were determined on the basis of quarterly rolling GDP. Source: ECB, Fed, BoE, BoJ.

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## 3 Changing consumption habits

The 2020 pandemic brought about an immediate change in consumer values and opportunities, resulting in a rapid change in consumption habits. Unlike previous economic crises, the pandemic has placed additional mental burdens on people besides financial uncertainty: anxiety, voluntary and imposed confinement, social distancing have made our everyday lives difficult. Meeting basic needs became a matter of urgency, while self-fulfilment needs lost priority, or were transformed. Health and climate awareness earned greater appreciation, with a sharp increase in the need for the use of contactless and digital options in almost all walks of everyday life: the presence of digital technologies has increased significantly in the areas of purchases, leisure, keeping contact with others, health, and education. This has been accompanied by a considerable fall in social consumption, i.e. leisure activities traditionally based on physical presence and social contact.

In addition to the aspects of convenience and required time, purchasing habits also came to be shaped by health considerations. As a result, forms of purchases involving less physical contact have become more prominent even among customers not using such options previously. The business model is shifting towards direct-to-consumer (D2C) operations, where businesses sell their products without relying on intermediaries and conventional channels of trade. As a result, companies specialising in deliveries have taken off, while physical stores have been put at a competitive disadvantage, and many have been forced to close. The trends seen during the pandemic will increase the weight of online retail also in the longer term, especially in the case of foodstuffs, household goods and medicines. At the same time, the greater weight of basic necessities in consumption patterns will at least partly persist even after the pandemic. Consumers are likely to retain their health and climate awareness in their eating habits for the longer term.

Social distancing and lockdowns have drastically reduced the range of activities that require physical presence outside the home. As the population was travelling less, tourism declined, and urban transport was also used less. Within the latter, cycling became more popular internationally and in Hungary. As people stayed at home, they had more time for healthier lifestyles, such as individual sports and cooking, while the amount of time spent in the digital space also increased. Once the restrictions are lifted, some of our new recreational behaviours may well remain. The longer-term impact of the pandemic on tourism will depend, to a large extent, on how successfully the pandemic is controlled globally. Social distancing has led to the increased role of virtual contacts to keep in touch with family and friends. In the consumption of films, restrictions intensified the pre-existing shift away from the cinema and towards video streaming services accessible from the comfort of the home. The number of people gaming and watching videos with gaming content is expected to remain higher even after the pandemic.

Social distancing has significantly accelerated the digitisation of education systems and training, healthcare and finance. Depending on the opportunities available for schools and families, the digital channel will partly retain the greater appreciation it has earned as a complementary means of education even after the pandemic. With its beginnings in pre-pandemic times, telemedicine, involving virtual physician-patient meetings, became firmly built into consumers' healthcare access patterns. Moreover, prevention is expected to receive more emphasis after the pandemic. The use of digital banking and contactless payment services has increased and is expected to continue to spread after the pandemic. In Hungary, this has been supported by the introduction of the instant payment system since March 2020, as well as the requirement to provide an electronic payment option at physical points of sale, effective from 1 January 2021. With the spread of digitalisation, our personal and financial data will become more accessible, making it especially important to improve the digital security awareness of the population, including children.

### 3.1 Main trends in consumption habits

The 2020 pandemic triggered immediate change in consumer values and opportunities, resulting in rapid change in consumption habits. Unlike previous economic crises, the pandemic imposed additional mental burdens on people in addition to financial uncertainty: anxiety, voluntary and imposed confinement, social distancing made our everyday lives difficult.

Health and climate awareness have earned greater appreciation with a sharp increase in the need for the use of contactless and digital options in almost all walks of everyday life: the presence of digital technologies has increased significantly in the areas of purchases, leisure, keeping contact with others, health, and education. The sharpest fall occurred in social consumption, i.e. leisure activities traditionally based on physical presence and social contact.

Initially, with the rapid spread of the pandemic, meeting basic needs became a matter of urgency, while self-fulfilment needs lost priority. According to an international survey by Accenture (2020), at the beginning of April most people (four-fifths of respondents) listed their own personal health and the health of family and friends among their three most important needs, followed by financial security, food and medicine security and personal security (Chart 3-1).

![](_page_54_Figure_5.jpeg)

Changed consumer needs were followed by a reduced size and changed structure of the consumer basket. Uncertainty led to an increase in savings and a decrease in discretionary spending, i.e. spending beyond the purchase of basic necessities. This resulted in a smaller consumer basket, in which the proportion of basic necessities and hygiene products is now significantly higher. According to McKinsey (2020b), the reduced size of the consumer basket and the increased weight of health-related and hygiene products may remain permanent features in the aftermath of the pandemic.

The role of individual responsibility and awareness has increased, creating a higher level of health and climate awareness in society.<sup>6</sup> Other than protecting themselves against the spread of infection, individuals can also strive to improve their health and the environment. A common feature of epidemics and climate change is that major damage to society can only be averted if society perceives the severity of the problem and is able to face an abstract threat (Funke-Klenert, 2020) (Chart 3-2). Unlike epidemics, however, climate change cannot be brought to a halt by the development of a vaccine<sup>7</sup> (DW, 2020d), while its longer time horizon also makes it more difficult to assess how the problem has been managed. In any case, the 2020 pandemic provided an exceptional opportunity to understand the challenges posed by climate change. Indeed, the coronavirus pandemic has shown that late measures can cause immense damage. In early 2020, the pandemic seemed abstract, and the vast majority of society did not even perceive the severity of the problem at the time. However, once infection became a tangible threat all over the world, society quickly adapted, accepted the promptly imposed restrictions, and changed its consumption habits.

Source: Accenture COVID-19 Consumer Research.

Chart 3-1: Consumer needs (survey)

The 2019 Growth Report focused on the condition of the environment as a factor of production, i.e. the quality and volume of natural capital. 6

"There's no vaccine for the planet." (António Guterres, UN Secretary-General)

# Chart 3-2: Potential link between the coronavirus epidemic and climate change and society's willingness to respond

![](_page_55_Figure_2.jpeg)

negative effect of the shock. As soon as it is perceived the willingness to respond increases sharply. conceptual; P= perceived, A=actual. Source: Funke-Klenert (2020).

Social distancing and lockdowns changed the commuting patterns of the population, and cycling has become more widespread. The use of bicycles and electric cars in urban transport increased significantly, reinforcing pre-existing consumer trends during the coronavirus pandemic. The rapid change in habits has also been driven by increasing health and climate awareness in society.

Work-related and recreational travel has also declined. Business trips were typically postponed or cancelled, with meetings organised on some digital platform. Non-business tourism has decreased significantly and international tourism has partly been replaced by domestic tourism, which has also caused a significant decline in air transport. Overall, the population travelled less, so they had to spend a significant part of their leisure time differently.

As people stayed at home, they found more time for healthier lifestyles such as individual sports and cooking, while the amount of time spent in the digital space – shopping, gaming, reading news or social networking – increased. The pandemic caused many people to lose their jobs, many were forced into part-time employment and many have been working from home (the impact of the pandemic on the labour market is described in detail in Chapter 4). Moreover, people were also obliged to stay put in their homes while quarantined, instead of the time earlier spent outside. As a result of the decline in tourism and visits to restaurants, people found themselves with extra time on their hands, previously spent elsewhere doing something else, now to be spent in some way at home. They adapted their habits accordingly. On the one hand, the amount of (leisure) time spent in digital format has increased. Social distancing shifted contacts with family and friends into the digital space. Also in shopping and entertainment, people opted for alternatives requiring no physical contact, accessible from home. On the other hand, the greater appreciation for health and, in part, the constraint resulting from restaurant closures, led to a healthier lifestyle. People took to preparing their food at home from unprocessed products. In addition, exercise (such as jogging in the neighbourhood) was also the opportunity for many to escape guarantine. Indeed, although possibilities for mass sports were limited at the time of lockdowns, individual forms of exercise continued to be allowed. According to a survey by PwC (2020b), people in the United States spent the extra time created by staying at home mainly with entertainment, news reading and hobbies, with increased amounts of time spent on online shopping, social networking, the media, physical exercise, and household activities (Chart 3-3).

![](_page_55_Figure_8.jpeg)

Source: PwC.

The trend of digitisation in consumption is not a recent phenomenon, the pandemic only accelerated and reinforced the uptake of existing trends. The coronavirus pandemic and the resulting nationwide lockdowns forced people to maintain contacts with the outside world through digital channels: not only for work, but also for shopping, seeing doctors, learning, and entertainment. The acceleration of using these services, albeit under compulsion, occurred at an incredible pace (MCKinsey, 2020b, Chart 3-4). According to data from sectoral newsletter PM2, in the United States the market share of online sales increased at the same rate (from 16 to 27 percent) during the first 8 weeks of the quarantine as in the previous decade. The number of users of a free telemedicine service accessible to anyone increased nearly tenfold in six months, from 80,000 to 750,000, by the end of last year. Based on data from UNESCO, UNICEF and the World Bank, from May to June 2020, 100 percent of the education system in all European countries used online platforms for distance learning in primary and secondary schools and higher education. According to a report by McKinsey (2020b), in China alone the number of participants in distance education increased by 250 million in the space of two weeks. Owing to the pandemic, digital platforms also made bold inroads in the entertainment industry: the second largest streaming provider reached its first 50 million subscribers in 5 months, which the largest provider had previously taken 7 years to accomplish. The number of subscribers to both companies has been increasing rapidly ever since.

![](_page_56_Figure_2.jpeg)

Some of the changes in consumption habits will be permanent. Once the pandemic is over, following the previous sudden increase the amount of extra leisure time spent at home will be reduced, the temporarily unavailable recreational and travel options will become available again. Many will try to make up for the shortfall in their consumption, because as social beings people have a basic need for personal encounters and contact. However, despite the fact that vaccines help to prevent further major waves of the pandemic, distrust and fear of a new outbreak may remain even after the pandemic has subsided.

Whether new habits prove to be persistent or temporary depends on several factors. According to analysts with McKinsey (2020b), the longer our engagement in our new habits (even if this happens under compulsion) and the more satisfied we are with them, the greater the likelihood that the trend will continue. They expect that the increased prominence of digitalisation in the areas of commerce, health and media-based entertainment will be sustained along with the role of home exercise. Spending outside the scope of basic necessities will also remain lower than before the crisis, with a sustained focus of consumption on health and hygiene. Other persistent consumption habits will include the shift towards a home-centred life, the decline in international tourism, and an orientation towards domestic tourism.

## 3.2 Purchasing habits – digitalisation and contactless commerce

With the global spread of the pandemic, consumers reassessed their purchasing habits and adapted them to the new circumstances. With greater appreciation for basic needs, basic necessities (foodstuffs, medicines, household and cleaning products) have become more pronounced within consumption. In addition, health considerations gave greater prominence to forms of purchases involving less physical contact, such as online orders delivered to homes or pick-up points.

With the rapid spread of the pandemic, meeting basic needs became a matter of urgency. According to the PwC survey (2020b), in the United States the purchase of frozen food and non-perishable groceries, as well as of household and cleaning products increased by a quarter compared to the pre-crisis period (Chart 3-5). The sharp increase in food sales may also be explained by the decrease in restaurant visits and by restaurant closures: people had to make home arrangements to replace previous restaurant consumption.

![](_page_57_Figure_1.jpeg)

Chart 3-5: Change in consumption of product groups

At the same time, the proportion of online purchases increased significantly even among customers who had not used such options before. According to McKinsey (2020c), 75 percent of US consumers tried a new buying method, either under economic pressure, due to store closures, or because their priorities had changed. The phenomenon is general, with a shift in retail purchasing habits towards online shopping regardless of income level. High income earners changed their habits even further: they shifted their online purchasing habits to the same degree to cover goods beyond the scope of basic necessities.

Hungary has also experienced an increase of online transactions within card purchases. Deák et al. (2021) demonstrate that in 2020 the proportion of online payments within card transactions increased by almost 4 percentage points overall. The ratio was the highest in the second quarter, when one in five purchases was made online. In that quarter, the number of physical purchases carried out domestically and across the border decreased by 8 percent and 70 percent, respectively, compared to the previous year. A correction in domestic sales occurred with the relaxation of restrictions in the third guarter, with some of the online buyers who had migrated from physical purchases opting for physical purchases again (Chart 3-6).

![](_page_57_Figure_4.jpeg)

#### Source: MNB.

Consequently, the greatest increase has been registered in online purchases for foodstuffs and medicines. A survey by Deloitte (2020c) found the greatest increases in online shopping in food (+56 percent) and medicines (+50 percent), followed by fashion (+49 percent), books (+46 percent) and beauty products (+45 percent). 23 to 41 percent of respondents reported previous online purchases in the product categories concerned, with an increase in frequency since the outbreak, whereas 10 to 18 percent made their first online purchases in a variety of categories.

When making their purchases, consumers showed a preference for methods involving less physical contact. According to the PwC survey (2020b), the greatest increase was registered in home deliveries of online purchases for foodstuffs, household and cleaning products, as well as personal care products and medicines. But it also became more popular to have packages ordered online, prepared in advance and delivered to pick-up points to avoid the crowd (Chart 37). Worldwide, the number of online food orders increased, with customers making their purchases less frequently, and, thanks to home cooking, in larger volumes.

![](_page_58_Figure_1.jpeg)

**Online cash register data show that the size of the shopping basket has also increased in Hungary.** Examining transactions by value band, Deák et al. (2021) found some of the purchase transactions to have moved from the band below HUF 5,000 to higher value bands. The proportion of purchases increased in all of the categories above HUF 5,000 (Chart 3-8). Furthermore, the vast majority of purchases (96 percent) remained for the second half of 2020 as well below the increased limit for contactless payments (HUF 15,000).

![](_page_58_Figure_3.jpeg)

In addition to the aspects of convenience and processing time, purchasing habits were also shaped by health considerations, which carried outstanding weight during the lockdowns. According to the Deloitte survey (2020c), among customers placing online orders in the preceding period, continued preference for online purchases based on health considerations was reported by nearly one-half of respondents in the case of food, and by more than a third in the case of medicines and beauty products (Chart 3-9).

![](_page_58_Figure_6.jpeg)

## Chart 3-9: Top reasons for buying more online in the next 12 months

#### Source: Deloitte.

Changes in purchasing habits will lead to a structural transformation on the sellers' side: digital sellers and companies specialising in deliveries will have a competitive advantage while many physical stores have been forced to close. Businesses are increasingly selling their products directly to consumers (D2C), without relying on intermediaries and conventional channels of trade. Online sales are becoming available to consumers on an increasing number of platforms (webshops and applications). Businesses specialising in deliveries are receiving a steadily rising volume of orders. By contrast, physical stores have faced decreasing demand, resulting in a significant wave of closures. (See Box 3-1 for details on corporate adaptation.)

Although catching up rapidly, businesses have only partially been able to meet consumer needs, which have been changing with shocking speed. Local stores continue to carry a wider range of products compared to online options, which would make many customers consider switching back from online shopping. In the Deloitte survey (2020c), to the question why they would not buy online in the next 12 months, nearly half of the respondents answered that the supply of food in local stores was better, and more than a third would support their local stores by their choice.

Large online sellers have also been facing problems because of the sharp increase in demand. According to the Accenture (2020) survey, respondents who made almost every purchase online during the pandemic felt that the sudden surge in demand could not be met by supply, which would cause them to use this purchasing method 9 percent less in the longer term, and switch back in part to shopping in traditional stores. Conversely, those who barely ordered online would increase the rate of their online purchases by 10 percent (Chart 3-10).

![](_page_59_Figure_2.jpeg)

![](_page_59_Figure_3.jpeg)

![](_page_59_Figure_4.jpeg)

Despite the temporary difficulties, the trends observed during the pandemic, will maintain the shift towards online purchases in the longer term. According to analysts with McKinsey (2020b), the increased importance of digitalisation in commerce will be sustained. This is supported by the fact that the vast majority (73 percent) of respondents to the McKinsey Consumer Pulse Survey would continue to use the newly tried purchasing methods (McKinsey, 2020c). In the global GCIS survey by PwC (2020c), 86 percent of respondents would continue to shop online or over the phone even after restrictive measures are lifted. Deloitte (2020c) found that, with the exception of some product categories – such as books, newspapers and DIY – consumers would use digital distribution channels in all areas to a similar or greater extent than before the pandemic. The greatest increase is expected in foodstuffs, household goods and medicines. In Hungary, a survey on the subject was conducted by NÉBIH (Hungarian National Food Chain Safety Office) in 2020, entitled "Quarantine Survey". The survey found that the trend of decreasing frequency of shop visits and increasing number of online purchases can also be identified in Hungary. In Hungary too, consumers increasingly prefer speed, safety and comfort in their purchases.

The change in the structure of consumption will also persist, in part, after the pandemic. According to the results of a global consumer survey by analyst firm Roland Berger (2020), consumers may buy more food, beverages and cleaning products, both in traditional stores and online, than before the pandemic (Chart 3-11).

![](_page_59_Figure_8.jpeg)

![](_page_59_Figure_9.jpeg)

Note: Question: In what categories do you expect to spend more/less in physical stores/online, compared to before Covid-19? Source: Roland Berger.

#### Box 3-1: Corporate adaptation to changing purchasing habits

The business model is shifting towards direct-to-consumer (D2C) operations, where selling digitally gives a competitive advantage. Digital sales are key to the survival of companies in the short term. Moreover, digitisation is expected to continue on the supply side after the pandemic. Of the companies responding to a survey by eNET, 40 percent expect to continue operations as during the pandemic, with more than a half preparing for digital expansion.<sup>8</sup>

Businesses have followed changes in consumer needs at a pace that was unimaginable before. Companies responding to a survey by McKinsey (2020a) reported having adapted to the new situation up to 20 to 25 times faster than they would have expected before the COVID-19 pandemic. They were able to meet changing consumer needs 24 times faster (21.3 days instead of 511 days) than previously planned, and to meet the demand for online purchases and services 27 times faster (21.9 days instead of the 585 days foreseen) (Chart 3-12).

<sup>8</sup> https://www.telekom.hu/rolunk/sajtoszoba/sajtokozlemenyek/2020/junius\_19

![](_page_60_Figure_1.jpeg)

In Hungary too, readily available and implementable solutions for digitalisation played a major role in the corporate development required to meet consumer needs. According to the eNET survey, digital functions such as webshops, cashless payment solutions, electronic contacts and online invoicing had already been used by Hungarian SMEs before the pandemic, but the number of users increased significantly due to the pandemic, with several companies planning to introduce innovations. The survey also showed that the more digital solutions a company used, the less its operations were impeded by the first wave of the pandemic.

Simultaneously, in 2020 e-commerce in Hungary increased at a rate that was significant even by international standards. Hungarian internet commerce showed the third largest growth rate in Europe with an increase of almost 40 percent (Chart 3-13).

![](_page_60_Figure_4.jpeg)

Despite this, the share of e-commerce in the retail sector in Hungary still lags behind both the EU average and the average of the Visegrad countries. Although e-commerce is increasingly becoming a key area of the economy, in 2020 the proportion of companies using its channels was below 14 percent in Hungary (Chart 314). In the large corporate segment, one in two Czech companies used e-commerce, compared to Hungary's ratio of 35 percent. Online channels accounted for 30 percent of the total corporates sales in the Czech Republic, and 23 percent in Hungary (the EU average was 20 percent).

![](_page_61_Figure_1.jpeg)

The level of digitalisation in the economy plays a key role in the uptake of e-commerce. Prepared by Eurostat, the DESI index measures the level of corporate digitalisation in four dimensions other than e-commerce: internet use, website and social media use, ICT security, as well as e-administration and general digitalisation. Based on the index, as with the proportion of companies using e-commerce, the level of digitalisation in Hungarian companies appears unfavourable as it lags behind the averages of the EU and the Visegrad countries (Chart 3-15).

![](_page_61_Figure_3.jpeg)

Note: Proportion of firms in e-commerce with more than 10 employees acquiring more than 1 percent of revenues from e-commerce. Without financial sector. Source: Eurostat, MNB calculation.

The new business model (D2C) requires companies to adopt not only digital sales, but also a new kind of organisation and logistics. In the medium term, self-driving vehicles, such as the Drone Delivery System service licensed in August 2020, may have great potential for cost-effective deliveries.

# 3.3 Fewer restaurants and healthier eating habits

Habits in the purchase and consumption of food have changed significantly since the beginning of the pandemic. The decrease in restaurant visits and the closure of restaurants have resulted in the need for the population to make home arrangements to replace previous restaurant consumption.

As their eating habits changed, consumers' health and climate awareness became stronger. The need for a healthy and sustainable diet has become widespread (Borsellino et al., 2020), along with an increase in the demand for local, fresh, and additive-free foods. As processed products were consumed in lower quantities, less waste was produced. Consumers preferred shorter supply chains and home delivery, with internet searches for "food delivery" and "local food" reaching a historic peak in April 2020 (Shveda, 2020). According to an international survey (Accenture, 2020), a large proportion of respondents expect to maintain the habits adopted during the pandemic in the long term. 68 percent of respondents would continue to produce less waste, with 60 percent making more health-conscious purchases, and some 50 percent choosing a nearby store. According to Deloitte (2020c), more than a quarter of consumers plan to prepare food at home in the future too, mostly due to lower risk of infection and better quality of food. According to the NÉBIH representative survey of 2020, Hungarian consumers, too, developed a preference for the products required for home cooking, and for foodstuffs produced in Hungary.

In terms of the future of the food industry, four megatrends can be identified (Deloitte, 2020b). An increasingly health-conscious lifestyle leads to (1) personalised nutrition and (2) responsible production and the avoidance of waste. (3) The digitalisation of the entire food chain is linked to food industry 4.0<sup>9</sup>. Finally, (4) the fine-tuning of the ecosystem is about bringing together actors along the food chain. Changes in consumer behaviour are reinforcing the trends observed in sustainability (PwC 2020a).

With the spread of teleworking and consumers becoming more climate- and health-conscious, a significant part of the changed habits in buying and consuming food may prove to be persistent. International surveys by PwC (2020a), Accenture (2020) and Deloitte (2020c) consistently suggest that most consumers would not revert to their pre-pandemic patterns. The adoption of teleworking for the longer term (see Chapter 4 for details) favours eating meals prepared at home and, consequently, a healthier lifestyle. In turn, the persistence of health-conscious eating habits supports the reduction of adverse climate change.

### 3.4 Travel and transportation

Social distancing and lockdowns have forced the population to change their travel behaviour. Lockdowns and border closures have restricted travel opportunities, with a major decline in tourism. Even as restrictions have become more relaxed, the population has remained cautious, showing a preference for domestic travel over international travel. In addition, urban commuting decreased due to the spread of teleworking during the pandemic. In transport, the population preferred forms of travel involving less physical contact. The persistence of such behaviour after the lifting of restrictions is reinforced by increasing health and climate awareness in society.

Along with (international) tourism, air transport also fell significantly during the pandemic. The second quarter of 2020 saw an immediate collapse, with no correction in the volume of passenger traffic ever since. The significant decline has had a positive impact on climate change. According to an international survey conducted by McKinsey (2020b), a part of society will prefer land transport even in the medium term. Even after the coronavirus pandemic, 39 percent of respondents would not opt for intercity air transport, which could have a positive impact on climate change. The longer-term impact of the pandemic on tourism is difficult to estimate and will depend, to a large extent, on how successfully the pandemic is controlled globally.

Consumers are increasingly opting for cycling and alternative (environmentally friendly) modes of transport, which is partly attributable to social distancing, government subsidies and increased health and climate awareness. Social distancing has led many people to switch to walking or cycling from public transport. Taking advantage of reduced car traffic during the pandemic, many cities have sought to promote environmentally friendly transport behaviour. Soon after the spread of the coronavirus in Europe, Brussels expanded its bicycle network by 40 km and Milan freed up 35 km of its road network. London has provided medical workers free access to electric bicycles. Berlin, Vancouver, Denver, New York, Mexico City and Bogota have also been leaders in supporting cyclists (DW, 2020b).

<sup>9</sup> New digital technologies such as AI, smart data and robotisation offer companies the opportunity to increase productivity and reduce costs.

The accelerated uptake of active forms of transport is confirmed by international data. According to the Strava dataset<sup>10</sup>, active transport (such as walking and cycling) increased by a significantly 42 percent globally already in 2019, a trend only to be intensified by the pandemic. In May 2020, London recorded an increase of about 120 percent year on year. The same figure is 76 percent for Berlin, 34 percent for New York, and 32 percent for Barcelona.<sup>11</sup>

**Budapest has also taken significant steps in supporting active transport.** A number of routes have been freed up for cyclists and pedestrians, with a significant benefits offered to those opting for public cycling.<sup>12</sup> In Budapest, in 2020 a 15 percent increase in bicycle traffic was measured compared to 2019 (Chart 3-16). However, growth already started before the coronavirus outbreak, and as early as January 2020, the traffic counter recorded a 28 percent increase on the previous year (Hungarian Cyclists' Club, 2021). Therefore, the pandemic only intensified bicycle use in Budapest.

![](_page_63_Figure_3.jpeg)

Source: Hungarian Cycling Club.

The use of electric cars has increased significantly due to subsidies and easier access. According to data from the European Automobile Manufacturers' Association (ACEA), in the third quarter of 2020 electric cars accounted for 9.9 percent of all motor vehicles sold in the European Union, an increase of 6.9 percentage points compared to the previous year. As in the European Union, the number of new electric cars also increased in Hungary during 2020. Subsidy schemes for electric cars have been available in Hungary since 2016. Renewed in May 2020, the scheme seeks to boost the market for electric vehicles (Tender for electric car purchase support, 2020). The subsidy is intended solely for the purchase of electric cars and may give this type of transport a significant boost.

**Consumers' climate protection preferences can also be reinforced by government-level responses.** Maintaining and providing further support for changed consumer behaviour can contribute to promoting climate protection. Germany, for example, remained committed to climate protection after the virus outbreak. A climate action plan is an integral part of the country's post-pandemic economic recovery plan (DW, 2020a). The German Chancellor considers it essential to support modern technologies and renewable energy (DW, 2020c). Government action plans facilitating recovery and seeking to promote climate protection can create a healthier world for the benefit of the whole of society (António Guterres, UN Secretary-General).

The coronavirus pandemic has stalled the trend of car sharing, as consumers prefer to use their own cars. Recent years have seen an explosive surge in car sharing arrangements worldwide. The Mol Limo system was launched in Budapest in January 2018, and expanded significantly in the first year, both in terms of users and the fleet size. Yet, the coronavirus pandemic seems to be reversing this trend all over the world. An international survey by McKinsey (2020d) shows a preference in society for private transport over community and shared options in order to avoid infection (Chart 3-17).

The number of users preferring car sharing decreased significantly during the pandemic, as confirmed by the **Deloitte (2020c) questionnaire survey.** Here, too, consumption behaviour has changed rapidly and significantly, showing a social preference for safety, a trend only set to be increasing in the future. Deloitte (2020c) has found a nearly 30 percent fall in the demand for shared vehicles in the aftermath of the pandemic. Respondents are reverting to using their own cars or bicycles in the long run for reasons including risk of infection (37%), habit (26.7%) and savings (19.5%).

<sup>10</sup> The largest collection of human-powered transport information in the world.

<sup>11</sup> https://www.fastcompany.com/90554980/the-pandemic-created-a-biking-explosion-how-can-cities-make-it-permanent

<sup>12</sup> Public cycling is also present in an increasing number of rural cities, with options available in Debrecen, Esztergom, Győr, Hévíz, Miskolc, Nagykanizsa, Pécs and Szeged.

## Chart 3-17: Means of transport considered safe during the coronavirus epidemic

Perceived health safety of mobility modes, percent of respondents

![](_page_64_Figure_3.jpeg)

Source: McKinsey Center for Future Mobility.

Overall, the coronavirus outbreak accelerated the change in traffic behaviour and benefited the choice of active forms of transport, electric cars and private cars. For many years to come, rapid changes in consumer preferences can benefit the active and alternative forms of transport that have spread worldwide. Apart from that, the rising number of teleworkers worldwide and the resulting decline in the overall number of journeys may be seen as another driver of climate protection. In part, teleworking is likely to be a persistent phenomenon, so the worldwide number of journeys is expected to remain at lower for the time being. According to a forecast by the International Air Transport Association (IATA), passenger aviation is also expected to return to pre-coronavirus levels only slowly, probably by 2024 (IATA, 2020). According to the survey conducted by McKinsey (2020b), international air traffic will be partially restored in the medium term, while domestic tourism will continue to play a strong role. They also report people's preference for staying at home (nesting at home) in the medium term, which will also reduce overall traffic.

# 3.5 Digitalised and contactless ways to spend leisure time

The pandemic caused a drastic fall in social consumption, i.e. leisure activities traditionally based on physical presence and social contact. Giving up personal contact and leisure outside the home (e.g. restaurant visits, cinemas or sports events), people turned to contactless alternatives that were accessible from the comfort and safety of the home. In the fields of contacts and entertainment (media and music consumption, games and sports broadcasting), (leisure) time spent in the digital space has continued to increase. In the PwC survey (2020b), 28 percent of respondents reported having tried and developed a new hobby during the pandemic.

The digital media and entertainment industry gained strength during the pandemic. According to a survey by Morning Consult (2021), the 20 fastest-growing brands last year include video communications (zoom, WhatsApp, Microsoft Teams), video streaming (Peacock, HBOmax, BBC) and video sharing (TikTok, twitch) applications along with the brands of mobile apps for online shopping, pharmaceutical manufacturers, and cleaning agents (Chart 3-18).

![](_page_64_Figure_9.jpeg)

Social distancing has shifted contacts with family and friends into the digital space. Self-imposed and regulatory restrictions to control the spread of the pandemic have hindered the maintenance of personal relationships. Regulatory lockdowns have restricted visits to catering establishments and meetings in community spaces, but humans are social beings, and as such they require contacts. Accordingly, the global consumption survey by PwC (2020c) reported alternatives to face-to-face meetings such as the increased use of video chat applications (59 percent of consumers worldwide), messaging applications (58 percent) and social media (58 percent). After the outbreak of the pandemic, social media consumption for keeping contact or for other media consumption was also widespread in Hungary.

The vast majority of consumers would maintain their increased media consumption even after social distancing is lifted. 91 percent of consumers would maintain their increased use of messaging applications, while 86 percent reported the same for social media and 74 percent for video chat applications (PwC, 2020c).

In the field of entertainment, rather than a temporary upsurge, the pandemic led to the acceleration of the existing hot trend for digital media consumption. With the continuing rollout of the wireless network and the emergence of new devices and advanced mobile applications, the role of digital media consumption has been increasing for years. According to a survey by Deloitte (2020a), in 2019 the average US household had 7 digital devices (smart phones, tablets, smart TVs, laptops), and 12 subscriptions per consumer. The survey found that the epidemic did not merely intensify the existing media trends temporarily but also accelerated them. Following the outbreak of COVID-19, the total number of subscribers increased in all areas, including video and music streaming, games, audiobooks, newspapers and magazines (Chart 3-19). In addition to the expansion of the market, the value of the content of the service gained in appreciation by consumers as service providers have been widening their supply. Consumer flexibility results in market volatility as switching between service providers and trying out services increase both new subscriptions and terminations.

![](_page_65_Figure_4.jpeg)

In the consumption of films, restrictions have led to major rearrangements, with cinema giving way to emerging alternatives that provide for safe viewing from the comfort of the home: television has regained its strength, accompanied by the continued uptake of streaming. The avoidance of mass events and limitations on the number of participants at social gatherings led to a collapse in cinema visits, and lockdowns forced service providers to close for months. Safe recreation has become important for consumers. As an alternative to cinema, consumers have partly returned to television and online streaming has also gained in strength. Cinemas offer the advantage of the big screen over recreation at home, which is counterbalanced by the comfort and safety of the home. In the longer run, online streaming may receive a permanently greater role next to cinemas.

As the ability to control their own entertainment is an important need for consumers, growth is expected to be temporary for television, and more permanent for streaming. The advantage of streaming services over television broadcasting is that it provides the consumer with the choice of what to watch, just like in the cinema. That said, the streaming offer is wider and more flexible, with films and a free selection of episodes from highly successful series, including original content that is not available elsewhere. Apart from the value of the service, its price is also an important factor for nearly a guarter of consumers (Deloitte 2020a). During the pandemic, streaming service providers recorded a significant increase in subscriber numbers. According to the PwC survey (2020c), consumers spent 36 percent more on media and entertainment already in spring 2020, after the outbreak.

As with digital cinema, theatre performances and concerts can also be followed via online broadcasting, which has emerged as a new type of service due to the pandemic. Theatres have also been forced to adapt to the new situation, with online performance broadcasts offered for the duration of social distancing. Theatre streaming service (SzínházTV) has also been launched in Hungary. While the service provides a different type of experience from personal presence, the performances can be viewed more freely from the comfort of the home. Reaching a wider audience can lead to the expansion of the market by making performances accessible to those living at long distances from theatres. Depending on returns on investment, this change may persist in the post-pandemic period in parallel with traditional performances.

Entertainment venues became empty during the pandemic, while music streaming services saw their user numbers increase. Music streaming providers increased the number of their subscribers by acting as digital substitutes for entertainment venues. As the services provided in entertainment venues are based on personal social experience, consumers will return to this form of entertainment in the long run.

Worldwide, the number of people gaming rose during the pandemic and is expected to continue rising afterwards. Nearly a third (29 percent) of US consumers was gaming on a weekly basis before the pandemic, according to the Digital Media Trends survey (Deloitte, 2020a). Since the outbreak, extra free time has led to a considerable increase in activity related to mobile games and video games, regardless of age. The fastest growth occurred in the younger age group, which may be linked to school closures or to the above-average rise in youth unemployment. For 29 percent of respondents, playing a video game is a more popular form of leisure time than watching a video. Moreover, more than a quarter (27 percent) of gamers consider gaming a social activity or a social experience. As a result, the increased prominence of gaming in leisure time is expected to persist after the pandemic. (Still, as the amount of leisure time decreases, the time spent on gaming may also be slightly reduced.)

Watching videos with gaming content (such as e-sports) has also become an increasingly common form of entertainment since the wider uptake of streaming, especially in the Asian region, a trend that has been intensified by the pandemic. With the spread of social media applications and streaming, gaming videos have become available in the digital space, where viewers can usually follow sports events or watch professional e-gamers at play. This includes videos with e-sports content, which are known, followed and played mainly in the Asian region (Chart 3-20). With the cancellation of traditional live sporting events, e-sports provided the opportunity for professional players (such as car racers, football and basketball players) to keep in touch with their fans during the pandemic. If traditional live sporting events are resumed after the pandemic, the popularity of e-sports may decline, yet remain higher than before the pandemic.

![](_page_66_Figure_6.jpeg)

## Chart 3-20: Share of respondents familiar with and engaged in e-sports

# 3.6 Digitalisation of education and training

Social distancing has significantly accelerated the digitalisation of education systems and training. The technology and the opportunity had been available before the pandemic (for example, smart boards were used in Hungarian schools), but there was no societal need for application. However, in the course of pandemic control, isolation from communities and school closures boosted the need for the remote digital training of learners staying at home on the one hand, and for the self-development of adults working from home on the other hand.

In education, e-learning had been occasionally used even before the pandemic. The advantage of the method is that it enables learners to cover the course material in a flexible schedule, to listen to it several times as needed, and to get immediate feedback on their progress. Especially for newer generations, this has made online training increasingly popular. It is also widely used as a means of upskilling on the job, where knowledge needs to be transferred to massive audiences.

Self-development through digital channels has earned greater appreciation by a population isolating in their

homes as a result of social distancing, which has also been supported by the expansion of supply. It has become important for employees to develop skills similar to those used at work, for which a large number of courses, made available free of charge during the first wave of the pandemic, were offered by educational sites on the internet. In addition, universities started to offer online courses and training, with the possibility to invite distinguished professors and lecturers often living far away. Conferences, previously held in a traditional arrangement involving personal attendance, were also transferred to the digital space.

The compulsion of the pandemic has led to a wide adoption of distance learning in the education system with the dominance of digital or online channels in the European region. Following the outbreak, almost all education systems in the world were forced to close schools and, as far as possible, to switch to distance education. According to the UN (2020) report of August last year, 1.3 billion children worldwide were affected by school closures in the period from May to June 2020. For many of these pupils (especially in developing regions) the right conditions for digital distance learning were lacking, and many of them had no internet access at home. Therefore, countries relied on multiple channels simultaneously (e.g. television, radio, paper-based education) for distance learning, while the role of digital or online channels varied from region to region (Chart 3-21). The online channel was used for distance learning in primary and secondary schools in all European countries, but only 50 to 70 percent of the countries in Africa. UNICEF estimates that 463 million children worldwide remained outside the reach of distance education.

Chart 3-21: Country choice of distance learning during school closures depending on education level and region

![](_page_67_Figure_4.jpeg)

The fast adoption of digital education and the reach of a wide range of segments in society was also facilitated by the service providers in Hungary. Schools and teachers gained temporary free access to training materials using virtual and augmented reality, as well as educational materials and websites for presentations, enabling students to acquire basic mathematical and linguistic skills playfully.

Depending on the opportunities available for schools and families, the digital option will partly retain the greater

appreciation it has earned as a complementary means of education even after the pandemic. Personal contact will retain its primary role in the education system even in post-pandemic times. However, where they worked well, to complement classroom education, elements of digital education will be retained, greater appreciation for which will help to improve children's digital competence. Therefore, children will be expected to spend more time online than before the pandemic. Thus, it is of outstanding importance to improve children's awareness of digital security.

### 3.7 Health care

The change in health care consumption habits has been driven by fear of personal contact and increased health awareness as a result of the pandemic. The pandemic has also posed an unexpected and significant challenge to the health care system. The change in consumer demand for health services has mostly been driven by fear of personal meetings, which increased demand for virtual physician-patient meetings. Consumer habits are also increasingly dominated by health-consciousness and the role of disease prevention has become more pronounced.

Virtual physician-patient meetings had already part of health consumption habits before the crisis, the epidemic has only accelerated the trend. The pandemic also posed an unexpected and significant challenge to the health system. The number of personal encounters decreased, and outpatient and GP consultations underwent a rapid transformation. Conventional outpatient care has become less frequent, while telephone and online virtual consultations have become established practice.

More than a quarter of US patient-physician consultations took place virtually in the first four months of 2020, and the number of virtual meetings doubled compared to the previous year (Deloitte, 2020d, Chart 3-22). The largest telemedicine provider recorded a nearly tenfold rise in the number of its users in the space of six months. In Hungary, general practitioners also gave advice more frequently over the phone; e-prescription has been introduced, whereby prescribed medicines and healthcare products are posted to the cloud and can be accessed by pharmacies.

Supported by positive consumer experience, telemedicine services are expected to remain after the pandemic. Virtual consultations have become more popular mainly due to fear of personal meetings due to the epidemic, but their long-term survival is made likely by positive experiences and convenience. The popularity of telemedicine may also be increased by the fact that it is also available to users living in locations with difficult access. According to a survey by Deloitte (2020d), 84 percent of the participants in virtual health services felt satisfied.

![](_page_68_Figure_8.jpeg)

The increase in consumers' health consciousness is also reflected in the use of health services, and prevention is expected to receive more emphasis after the pandemic. As part of health consciousness, we are increasingly paying attention to our own bodies, monitoring our own health. This is assisted by the growing number of smart watches and bracelets available, which also feature functions for sleep monitoring and cardiac arrhythmia monitoring. In addition to product purchases, employers also help to meet consumers' prevention needs. Even before the pandemic, employers had increasingly been providing preventive screening to employees as a benefit. These services were offered under contract with private healthcare providers, with a wide range of health assessments carried out in one place. The importance of health consciousness and prevention is expected to play a prominent role among consumer needs even after the pandemic.

# 3.8 Digital banking and payments

As a result of the pandemic, preference has increased for contactless digital alternatives in banking and payments. Driven by the increased (health) consciousness they developed during the pandemic, people avoided physical contact during payments and banking requiring face-to-face contact to a greater extent than before the pandemic. The uptake of online banking was supported by many banks' expanded the range of online/digital services during the pandemic.

In the autumn 2020 survey of the MNB, nearly 40 percent of the respondents reported that their payment habits had changed due to the virus situation. In the period after lifting the restrictions imposed during the first wave of the pandemic, 20 percent of the respondents made more frequent card payments, 5 percent bought online more frequently, and 1 to 2 percent used transfers more often to pay friends (Deák et al., 2021). This change was mainly seen in the age group under 60 years of age.

Hungary has seen an increase in the proportion of card purchases among the payment methods at physical points of sale. Deák et al. (2021) demonstrate that as a result of the pandemic, the proportion of card purchases within all transactions made via online cash registers increased at a significantly faster pace compared to previous years (Chart 3-23). In addition, the uptake of card payments was supported by the introduction of card payment options in many places (such as grocery stores) and the raised limit (also in Hungary) for contactless card payments without the use of a PIN number.

![](_page_69_Figure_4.jpeg)

The spread of electronic payments was also accelerated by the epidemiological situation in Hungary, and further strengthened by the entry and uptake of a larger number of solutions relying on instant payment, launched as of 2 March 2020. Deák et al. (2021) demonstrated an increase in the proportion of online payments among card payments (Chart 324). For online payments, the number of debit card transactions increased by 35 percent, and that of credit card transactions by 25 percent. Simultaneously, the number of debit card purchases at physical points of sale increased by 7 percent, while the number of credit card transactions decreased by 13 percent.

![](_page_69_Figure_7.jpeg)

The use of digital banking and payment services will continue after the pandemic, and is expected to spread further. According to an international survey by Deloitte (2020c), 38–50 percent of customers would use online banking and card and mobile payments even more frequently after the pandemic (Chart 3-25).

Chart 3-25: Distribution of future use of digital banking

![](_page_69_Figure_9.jpeg)

Note: Among respondents who said they had increased online shopping behaviour during COVID-19. Source: Deloitte (2020).

Several factors support the persistence of consumers' changed financial habits in Hungary. The uptake of electronic payments is supported by the fact that at the end of 2020, recognising the growing demand, several banks had already introduced an instant payment service, such as the

merchant-side QR code generating application, which, in addition to card acceptance, offers an additional alternative to the use of electronic payments. Moreover, as of 1 January 2021, it has become mandatory to provide an electronic payment option at physical points of sale. Deák et al. (2021) demonstrate that according to the survey conducted by the MNB in the autumn of 2020, 45–52 percent of respondents in the age groups below 60 years of age considered making more frequent electronic payments as a result (Chart 3-26).

![](_page_70_Figure_2.jpeg)

# 3.9 Data protection and digital security

With the spread of digitalisation, our personal and financial data are becoming more accessible. The role of digital alternatives in the activities of the population has increased from shopping and recreation habits to administration, education and health. At the same time, the population has been providing more personal and financial data on the internet for a better service experience, which means that such data will become more easily accessible. In its survey, Deloitte (2020c) found that nearly half of the German population (46 percent) consented more than once to the use of their personal data (Chart 3-27). At the same time, it is important that public awareness of the protection of personal data has increased since the outbreak. A pointer in the right direction is that the increase in digital solutions in the post-pandemic period will not entail a change in the habits that users adopted in the pre-pandemic period regarding consent to data use. 80 percent of the German population would not

change their consent to the use of their personal data, while 11 percent would consent more, and 9 percent would consent less.

Chart 3-27: Do you agree to the storage, use and processing of personal data more often during the COVID-19 crisis?

![](_page_70_Figure_7.jpeg)

Europol (2020) underlines awareness of the importance of caution about the retail finances and children's Internet habits. More people are using online services and there is an increase in the number of people who manage their finances through digital channels, whereby malicious attacks and phishing attempts may also increase. In addition to that, children are expected to spend more time online than before the pandemic. It is therefore of exceptional importance to improve the awareness of the population and of children of digital security.

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# 4 Consequences of the pandemic in the world of work

Labour markets have responded to the pandemic differently from previous crises, with employment decreasing less than during other recessions of a similar scale. The resilience of the labour markets is attributable to government and central bank measures, the stability of the financial and credit markets and the intensive-side adjustment of the labour markets. In the highly flexible labour market of the US, the unemployment rate rose to historically high levels in the space of a few weeks during the first wave of the pandemic, - to be corrected for the most part by the end of the year. Meanwhile in Europe, the labour market mainly saw intensive-side adjustment, i.e. a reduction in working hours. The two different patterns emerged because of different crisis management approaches in the labour markets. In the US, direct transfers were made to households, while in Europe government subsidies were used to retain company workers. In Hungary, reduced working time programmes were introduced which, along with a loan moratorium of a wide and general scale even by international standards, curbed redundancies and supported workers' incomes, while effectively reducing wage costs for companies. The loan moratorium and the dynamics of the Hungarian credit markets, which have remained healthy despite the economic recession and has also been supported by the central bank, have contributed to maintaining the level of employment. In the short term, labour markets proved resistant to the economic effects of the coronavirus, but adverse employment effects may be intensified in the event of a prolonged economic recovery and a possible deterioration in profitability.

In addition to short-term labour market adjustment, the coronavirus has accelerated the megatrends that have already shaped the world of work in the past. As a result of health risks and physical distancing, the proportion of teleworkers increased to historically high levels. The applicability of teleworking varies considerably according to the level of economic development in each country, the quality of the digital infrastructure, and sectoral and job characteristics. Initial experience of the coronavirus crisis has confirmed that a greater proportion of jobs in finance and insurance, as well as IT, are teleworkable, as opposed to jobs in farming, retail and catering. Hungarian data show that working from home was typically implemented at higher levels of educational attainment. The lessons learned from the pandemic suggest the potential start of a new era of teleworking after the pandemic.

In addition to the increased presence of hybrid work (a combination of on-site work and teleworking), the megatrend of robotisation and automation, which has been going on for years, may also intensify in the post-COVID era. The rapid and worldwide spread of the pandemic has highlighted the health risks of the human workforce, thereby catalysing the automation of production and service processes. In the coming years and decades, a new division of labour may emerge between humans and machines. Certain jobs may be lost in this process, but, as we have seen during previous technological revolutions, new jobs may be created simultaneously. The challenges in the labour market are enhanced by the fact that automation affects different jobs to different degrees. While elementary activities (those of shelf stackers, cleaning staff) and plant and machine operators' work processes can largely be automated, health and education professionals and management positions are less exposed to the process. The acquisition of new skills and competences is essential in order to avoid polarisation in the transforming labour market. In addition to digital and IT knowledge, competences such as creativity, complex problem solving or being a good negotiator are gaining greater appreciation because they cannot be automated. Adaptation of market participants is essential for the post-coronavirus transformation of labour markets. The key factors may be the acquisition of new skills and lifelong learning by employees, as well as the provision of reskilling and upskilling by employers.

# 4.1 Developments in the labour market during the pandemic

The coronavirus pandemic has brought about a sharp turn on the labour market worldwide. The consequences of the changed economic situation were serious particularly in the early stages of the pandemic when a major part of employers responded by making employees redundant or sending them on unpaid leave. Even employees in more favourable situations had to face changed working conditions.

Despite the gradual improvement in the labour market situation, the global labour market suffered significant losses in 2020. According to the current estimate of the United Nations labour organisation (ILO 2021), around 114 million people may have lost their jobs last year. As the hours worked fell more than the number of employees, the loss was equivalent to 255 million jobs (Chart 4-1). A majority of those losing their jobs (81 million out of 114 million worldwide) have stopped looking for work, increasing the number of inactive people rather than the unemployed. By the end of 2020, the situation on the labour market improved considerably, which is also explained by the fact that the second wave of the virus affected manufacturing production to a significantly lesser extent than at the time of the outbreak. Nevertheless, in 2021 employment may at best only approximate its pre-crisis level according to the most optimistic scenario of the ILO.



Note: Relative to 2019. The full-time equivalent (FTE) estimate was calculated as a 48-hour working week. Source: ILO (2021).

#### 4.1.1 THE CORONAVIRUS HAD A DIFFERENT IMPACT ON THE LABOUR MARKET THAN PREVIOUS CRISES

The effects of the epidemic became evident in the US labour market immediately and spectacularly. Similarly to other aspects of the economy, COVID also disrupted the labour market, which was forced to adjust as the economy ground to a sudden halt. Initially, the imposition of restrictive measures had a shocking effect. The US labour market responds more flexibly to fluctuations in economic performance, as companies often resort to temporary layoffs (unpaid leave, furloughs), which makes it easier for them to recall workers as the economic situation improves. In the US, temporarily laid off employees are considered unemployed. The appearance of the coronavirus resulted in a rapid and significant rise in unemployment in the United States, sending its rate up by 10.4 percentage points in a single month in April 2020 (Chart 4-2). The rise in the unemployment rate and the level it hit were both significantly higher compared to the figures registered during the 2008–2009 recession. The rapid adaptability of the US labour market is shown by the steady fall in the unemployment rate with a simultaneous decrease in temporary layoffs. By early 2021, unemployment dropped to around 6 percent.



2016

2017 2018 2019 2020

2021

2015

2014

Chart 4-2: Based on seasonally adjusted monthly data.

2008 2009 2010 2011 2012 2013

0

2005

2006

2007

In Europe, the unemployment rate only rose at a moderate pace. In the second quarter of 2020, the European Union GDP decreased by an unprecedented rate of 13.8 percent year on year. The number of production sector workers hired under the national accounts system decreased by 2.8%, a substantially lower rate than the EU average. The unemployment rate rose from 6.5 percent before the outbreak to only 7.8 percent in 2020. In addition to the extent of change in unemployment, the timing of unemployment in the EU-27 Member States was

Note: Based on seasonally adjusted monthly data. Source: Eurostat.

also different from that in the USA. While the US unemployment rate peaked within a single month after the outbreak, unemployment in Europe progressively increased until August. However, the moderate decline in employment does not fully reflect the changes in the labour market; indeed, the number of hours worked decreased by nearly 14 percent in the second quarter, in line with the decline in GDP (Chart 4-3).



Compared to previous crises, labour markets have responded less intensely to the challenges posed by the coronavirus. Historical crisis experience indicates the existence of a general lag in labour market response to changes in economic activity. In relative terms, the decline in employment was considerably more moderate in 2020 than during the 2008–2009 crisis. Based on our estimate for European countries, the unit decline in GDP resulted in a 0.6 percent drop in employment in the previous crisis. The same parameter decreased to under 0.3 percent during the coronavirus crisis (Chart 4-4). In the vast majority of countries, this "Okun's parameter" was significantly lower than in the previous global recession. At the same time, it is worth noting that adverse employment effects may be intensified in the event of a prolonged economic recovery. Companies that are in an adverse profit situation and run out of their financial reserves may resort to redundancies at a higher rate.

### Chart 4-4: Change in employment per unit change in GDP



Note: The Okun parameter (annual change in employment / annual change in GDP) was calculated for crisis lows based on currently available quarterly data. In some countries, parameters were not included in case of lack of data or negative sign. Source: MNB based on Eurostat.

Moderate labour market responses in the short term are explained by a combination of factors. As a result of the pandemic, the unemployment rate in the United States increased immediately, whereas intensive-side an adjustment occurred in Europe, i.e. a large reduction in the number of hours worked, with more moderate employment effects. The moderate rise in unemployment in Europe is also explained by the fact that companies used government and central bank programmes to retain their employees. The nature of the economic recession that occurred as a result of the pandemic differed significantly from previous ones. On the one hand, the expectations of market participants, subject to the lifting of restrictions, reflected a prompt rebound in economic performance while on the other hand, financial and credit markets also remained stable. In addition, in the first wave of the pandemic, restrictions prevented many people from seeking work actively, therefore some of those who lost their jobs moved directly into the inactive category. (ECB, 2020a; MNB, 2020).

Labour markets have proved to be more resilient than expected in the pandemic situation. As a result of the border closures, international tourism ground to a halt, and lockdowns and other restrictions forced certain segments of the services sector to suspend their business operations. In the meantime, temporary factory shutdowns were announced in several industrial sub-sectors because of supply chain disruptions and the necessity to create safe work environments in compliance with health protection measures. Initially, this gave rise to concerns of a significant increase in the number of unemployed. The rapid deterioration of indicators reflecting labour market sentiment predicted a much stronger wave of redundancies than was eventually recorded in the spring months (Chart 4-5).



Labour market adjustments primarily took place on the intensive side (typically in the form of short-time and part-time work), and the hours worked declined at an unprecedented rate. Changes in average working hours varied significantly across EU Member States (Chart 4-6). In relative terms, intensive-side labour market adjustment played a meaningfully greater role than during the previous crisis. In OECD countries, typically comprising developed economies, the decline in working hours was on average 10 times greater than in the first months of the 2008–2009 global financial crisis (OECD, 2020).



The Hungarian labour market also adjusted primarily on the intensive side in 2020. Following the outbreak of the virus in Hungary (March to May), private sector employment fell by 1.6 percent. The decrease in the hours worked was a significantly higher 7.3 percent, indicating a substantial intensive-side reaction by Hungarian companies. The decrease in per capita hours worked compared to the same period of the previous year persisted for the rest of 2020 (Chart 4-7). In Hungary, the intensive-side adjustment occurring in parallel with the redundancies is well indicated by the unusual proportion of employees not working in the reference week. Due to its methodological characteristics, in the Labour Force Survey the employed population also includes those who did not work at all (that is, 0 hours) in the week preceding the survey but were only temporarily absent from work. In April 2020, the number of people in this group was six times higher than a year earlier. Most respondents attributed absence to the pandemic and related reasons (HCSO, 2020). Some of the companies temporarily suspended their activities while retaining the workforce in this period. During the spring restrictions, due to the closure of primary schools, kindergartens and crèches, parents with younger children were forced to suspend work activities. Many people were forced to take paid or unpaid leave, and the number of people on leave and sick leave in the second quarter was twice as high as a year earlier.

Chart 4-7: Decomposition of the annual change in fulltime equivalent (FTE) employment



Note: Private sector, without employees working abroad. Source: HSCO, MNB estimation.

Vulnerable social groups are more exposed to the effects of the crisis. In the fourth quarter of 2020 year on year, Hungary registered a 7.3 percent fall in employment among young people (aged 15–24), and a 2.5 percent fall among the low-skilled compared to the same period of the previous year. Employment at the level of the national economy was only 0.8 percent lower in the same period (Chart 4-8). The youth unemployment rate is typically higher than the average even in times of economic booms. Across the EU, youth unemployment rose by an average 2 percentage points in the second quarter of 2020, while the aggregate unemployment rate (ages 15–74) rose by only 1 percentage point year on year.



## 4.1.2 MEASURES SUPPORTING LABOUR MARKET ADJUSTMENTS

The USA and Europe have adopted different strategies to address the decline in their labour markets. Economic policies implemented different strategies to tackle shocks to labour markets and households as a result of the pandemic. In Europe, economic policy focused on preserving jobs, while in the US extra income was distributed directly to households in order to compensate for the loss of income caused by rising unemployment. In the USA, the Consolidated Appropriations Act (a package amounting to 4 percent of GDP) focused primarily on supporting households and the unemployed. The effect of this appeared as early as January 2021 in the form of an 11 percent increase in households' disposable incomes, accompanied by a 2 percent rise in consumption expenditure in real terms (OECD, 2021). The fiscal stimulus planned under the American Rescue Plan is significant even by international standards, amounting to more than 8 percent of the GDP. Almost one-fifth of the package including incentives are provided to households. Based on data collected by the OECD (2020), around 60 million people worldwide participated in some kind of job retention programme. These have been highly popular in New Zealand and Europe (Chart 4-9). The low domestic ratio is due to the fact that credit growth has continued despite the coronavirus crisis, thus employment has been remained high even with the smaller amount of support.

Chart 4-9: Proportion of employees approved for job retention schemes



Note: Data refer to end May except for Luxembourg and Switzerland (end April). Employees who work directly for a company and are not self-employed. US data refer to participation in short-time compensation schemes. Source: OECD (2020), \*In case of Hungary, MNB estimation based on ITM and HSCO data.

In Europe, governments launched a wide range of job protection schemes. Mindful of the negative experiences of the previous crisis, European governments were determined to dampen the level of redundancies, the rise in unemployment. To that end, a large proportion of job retention schemes have been used (ECB, 2020b). After the 2008–2009 crisis, unemployment in Germany did not increase, which was primarily attributed to the success of Kurzarbeit. The essence of the program is that the state takes over part of the wages of employees working in the private sector on condition that the employers maintain the number of employees on their payroll. Brenke et al. (2011) concluded that in the absence of short-time work, the increase in unemployment would have been twice as large. During the 2008–2009 crisis, 25 out of 33 OECD countries used reduced time employment (Balleer et al., 2016), although the program only affected a relatively small proportion of the entire working population. Following the successful German example, during the coronavirus most European countries mitigated the negative employment effects with schemes based on the Kurzarbeit model.

The extensive use of reduced time working programmes have played a key role. Part-time arrangements have been successful in curbing redundancies, supporting workers' incomes, and effectively reducing the (wage)cost burden on companies (ECB, 2020c). According to Giupponi and Landais (2020), reduced time working agreement packages are more effective crisis management tools than unemployment benefits or general transfers. Lydon et al. (2018) found that sectors using reduced time working arrangements recorded a mere 0.12 percent work force reduction per unit of decrease in output, while the same rate was 0.4 percent in sectors where the proportion of companies using reduced time working was low. Based on the calculations of the ECB (2020b), unemployment would have risen to a much higher level during the first wave of the pandemic in the absence of reduced time working programmes. The schemes helped to preserve jobs in the acute phase of the coronavirus and may also accelerate the economic recovery, having contributed to the maintenance of relations between employees and employers, and thus to saving the cost of recruiting new staff. Measures affected 11.7 million employees (30 percent of employment) in Germany, 13.1 million in France (55 percent), 8.2 million in Italy (45 percent), 3 million in Spain (18 percent), and 2.1 million in the Netherlands (28 percent). Hijzen and Martin (2013) point out the importance of programme timing. While reduced working hour programmes help to preserve jobs in times of crisis, overstretching schemes may be a drag on the number of new jobs created at the time of recovery.

In Hungary, several labour market programmes were launched in the spring. The measures put in place, as well as a loan moratorium in Hungary, which is wide-ranging and general in international terms, have successfully curbed redundancies and supported employees' incomes, while effectively reducing wage costs for companies. The loan moratorium and the dynamics of the credit markets, which remained steady despite the economic crisis (and was also supported by the central bank) contributed to sustain the level of employment. As part of the reduced working time job protection scheme, the state reimbursed employees for 70 percent of their 15 to 75 percent lost working time for 3 months, up to twice the minimum wage. The available subsidy was capped at HUF 112,000. The second job protection programme involved wage subsidies for the research and development sector, available until the end of August 2020 regardless of changes in corporate income or working hours. In this programme, the state undertook to cover 50 percent of the wages, up to HUF 319,000 per employee. In addition to job protection subsidies, job creation wage subsidies were launched in the spring of 2020. The aim of that program was to create new jobs, and thereby to support the registered unemployed to find employment. The employer applying for the subsidy may receive a monthly subsidy of HUF 200,000 for the amount of the gross wage plus social contribution tax, for a period of 6 months. Until its closure, the programme helped to create 49,000 new jobs. In July 2020, nearly 250,000 people participated in Hungarian job retention schemes, the vast majority comprising recipients of job protection wage subsidies

(Chart 4-10). From late 2020, job protection and job creation wage subsidies were gradually replaced by sectoral wage subsidies, in which nearly 100 thousand people participated at the beginning of 2021. The sectoral wage subsidy is a wage subsidy of 50 percent per person employed, provided to enterprises in distress due to epidemiological restrictions, up to a monthly HUF 250,000 gross. The sectoral wage subsidy has proved to be popular in the sectors most affected by the coronavirus crisis (catering, accommodation, sports and leisure). The preservation of jobs covered micro, small and medium-sized enterprises as well.



Source: MNB estimation based on ITM.

### 4.2 Labour market megatrends accelerated by the coronavirus

The coronavirus has brought about rapid labour market changes comparable only to the world wars. The labour market effects of the pandemic became immediately apparent in the time series produced by the statistical offices, but in many cases the change proved to be temporary, with many labour market indicators approaching their pre-pandemic level within quarters. At the same time, the pandemic also intensified existing trends that will define the years and decades to come. It is a very rare phenomenon on the global labour market for such a major unforeseeable transformation to take place in a matter of weeks or months. In the last hundred years, only the world wars have caused such a structural change, including the mass employment of women in the industrial sector, which had never been seen before. As a result of the coronavirus, everyday life and social behaviours have radically changed, which has also had a significant impact on work performance. Companies were forced to adopt new operating procedures in mere weeks or months, in which innovative forms of working played an increasing role. The shocking compulsion to adapt to the new circumstances accelerated decades-long megatrends such as the spread of teleworking, digitalisation and automation on the labour market.

#### 4.2.1 A NEW ERA OF TELEWORKING

**Prior to the outbreak, teleworking was not used extensively in the world of work.** In 2019, teleworkers (employed on a regular or occasional basis) only made up an average 11 percent of all employees in the EU-27. The prevalence of teleworking in the Central and Eastern European region and in most of the Mediterranean countries was even lower than the EU average. In Hungary, only 3.6 percent of employees worked remotely before the coronavirus outbreak (Chart 4-11). The diverse structure of economies played an important role in the differences between countries. In countries such as Sweden, Finland, and the Netherlands, where knowledge and technology-intensive services had a larger share, teleworking was more popular already before the pandemic (Sostero et al., 2020).



The use of teleworking increased suddenly and significantly because of the pandemic. As a result of the pandemic, our general sense of safety drastically deteriorated, prompting adjustments in workplaces that require physical presence and social work. Adjustment occurred at an unprecedented pace, and the proportion of employees assigned to or opting for teleworking multiplied by several factors in a matter of weeks. The sea change in trends affected Hungarian companies and employees like wildfire, since they had worked remotely only to a negligible extent before the pandemic. The share of employees not working at their physical workplaces rose from 2.3 percent in February 2020 to over 16 percent in April-May (Chart 4-12). Although the sudden adjustment following the first wave of the epidemic was corrected in the second half of the year, still, on average more than 8.5 percent of employees were working remotely in 2020. It is worth noting that in addition to occasional teleworkers, the proportion of employees regularly working in this form has increased significantly.



Workplaces require different degrees of personal physical contact between employees and customers. Analysts with McKinsey (2021) divided jobs into 10 groups along the physical dimension of work. Due to the greater appreciation for health risks, the physical proximity of persons (employees and customers) determined the degree to which workplaces were affected. Production, transport and educational activities typically require more physical distance, while medical, travel and social entertainment activities involve more physical contact (Chart 4-13). In their view, greater transformations are taking place in workspaces that previously required closer physical proximity and more personal interaction.

## Chart 4-12: Proportion of teleworkers or home office workers



The applicability of teleworking varies considerably across sectors. According to Sostero et al. (2020), an estimated average 37 percent of employees work in jobs that can be done from home (Chart 4-14). Although that ratio far exceeds the average prevalence of teleworking in 2019, it indicates that there are many jobs whose location cannot be changed flexibly. The potential proportion of teleworking in developed countries is significantly higher than in emerging and developing economies, as it requires advanced digital infrastructure and a greater bearing of the services sector. According to WEF (2020), 80 to 90 percent of the workforce in Egypt, Bangladesh or Mexico cannot participate in teleworking. Working from home is applicable to varying degrees across sectors. A higher proportion of jobs in finance and insurance, IT and communication are teleworkable, as opposed to a much smaller proportion of jobs in farming, retail and catering (WEF, 2020).



Chart 4-14: Teleworkablity and the prevalence of telework across countries The possibility of the transition to teleworking varied across segments of the Hungarian labour market. In harmony with international trends, teleworking in Hungary was primarily an option for the services sector. From April to June 2020, 31.5 percent of employees in the service sector worked remotely either occasionally or regularly. Meanwhile, the same ratio was between 5 and 10 percent for vehicle manufacturing, transport, construction, or health care. During the second wave, the proportion of teleworkers was lower in all sectors, but still exceed pre-pandemic levels. The proportion of teleworkers remained high in the services sector and in education (Chart 4-15). Working from home was typically accomplished at higher levels of educational attainment. Nearly half of university graduates and more than 37 percent of the college graduates worked from home during the same period. By contrast, in the first wave of the epidemic, less than 2 percent of physical workers, vocational school graduates, and those with an educational attainment of up to 8 years were in telework (Köllő, 2021). The variation in teleworking trends is confirmed by the joint survey of G7 and SAP (G7, 2020). According to the responses of companies operating mainly in the sectors of trade, finance and IT, the transition to working from home was largely successful, with 56 percent of the companies surveyed responding positively. In the fields of IT and finance, nearly 100 percent of companies were able to take advantage of the opportunity, while only one in five companies in tourism was able to make the - presumably partial - transition to teleworking.



Note: In proportion to those employed who worked at least one hour in the week preceding the survey. Source: MNB based on HSCO.

The efficiency of teleworking varies by job type. The potential of teleworking varies strongly by sector, depending on the tasks and activities that can be performed remotely within the related occupations. In terms of workspaces,

computerised office work can essentially be done remotely, but not always with the same efficiency. Thus, productivity also plays an important role in the optimum applicability of teleworking. Experts at McKinsey (2021) estimate that 39 percent of jobs can be done from home, but that rate drops to 29 percent when efficiency losses are considered. In specific areas, the difference between the efficiency of on-site work and teleworking may be even more significant. Teaching is a good example: digital education was inevitable during the acute stage of the pandemic, however in the absence of adequate digital infrastructure and qualifications, in many cases education may have become less effective.

A majority of Hungarian company managers reported no productivity effects from on site or remote work (Chart 4-16). In addition, roughly the same proportion of responses indicated productivity gains due to home office (18 percent) as loss of productivity (17 percent). The corporate area also had an impact on perceived productivity change, with efficiency gains reported mostly in the banking and IT sectors (G7, 2020).



Working from home has significantly reshaped the daily lives of employees. One of the consequences of working from home has been savings in commuting time. In their research involving 5,000 respondents, Barrero et al. (2020) examined how the time saved was spent. Instead of the previous commuting of an average of 54 minutes per day, nearly 43.7 percent worked in their main or second job, while the rest of their time was devoted to childcare, household, or leisure activities. The amount of overtime increased at lower levels of educational qualifications. Compared to graduates, second jobs were nearly twice as frequent among employees with up to secondary school qualifications. While teleworking allows flexible work, striking the right work-life balance, and the absence of personal contacts can be a challenge. According to a survey by the Hungarian Central Statistical Office (KSH 2020b), Hungarian teleworkers evaluate working from home much more positively than their non-participating colleagues, who tend to exaggerate the risks involved.

The experience from teleworking suggests that a form of hybrid work may become dominant after the pandemic. Due to the pandemic situation, companies were under compulsion to transition to teleworking. Calculations by McKinsey (2021) suggest, however, that even when the pandemic has subsided, four to five times more people will be able to work remotely than before the pandemic. A survey conducted in the Hungarian labour market also confirms that hybrid work can be popular in the spirit of smart work. According to a survey by BCG and Profession.hu (2021), neither employees nor employers think that office work will return in its pre-pandemic form. Depending on the tasks involved, work will be done alternately between the office and the home (or another location away from the office). On-site work will become less prominent in the future. 60 percent of employees and 77 percent of employers believe that some form of teleworking will persist even after the pandemic (Chart 4-17). This will primarily be some combination of on-site work and teleworking, in alternating or hybrid form. It is highly unlikely that all working days would continue to be worked remotely, and as the risk of infection is reduced, maximising productivity will become a priority again. Certain tasks can be performed much more efficiently when employees are in the same place.



## 4.2.2 ACCELERATED AUTOMATION AND LABOUR MARKET POLARISATION

Automation and digitalisation had already shaped labour markets before the outbreak of the coronavirus. The rapid technological development of the past decades has challenged and encouraged the labour markets to transform for years and decades (Virág, 2019). Over the past decade, experts have actively been discussing the possible effects on the labour market of megatrends such as digitalisation and automation. According to pre-pandemic scenarios, nearly one-half of the workplaces could be partially affected or replaced by automation and robotisation (Frey and Osborne, 2013; Manyika et al., 2017; World Bank, 2016). The degree of automation may vary from sectors and jobs. The first wave of robotisation occurred in the manufacturing industry. The ratio of robots per unit value added has substantially increased lately, mainly in Asia and the CEE region. The Czech Republic, Slovakia and Hungary are now among the most robot-intensive economies in the world, following large processing and manufacturing powers such as Korea, Japan or Germany (Chart 4-18).



ded (millions USD). Source: OECD.

Rather than job losses, the robotisation trends of recent years have led to the transformation of the labour market. The more extensive use of industrial robots has not reduced the proportion of low-skilled workers in Europe (Klenert et al., 2020), while the automation of routine tasks had different effects in developed and emerging economies (de Vries et al., 2020). According to Acemoglu and Restrepo (2016), technological development results in the creation of new jobs, since processes that tend to destroy jobs (automation, robotisation) are accompanied by innovative processes that create jobs. The emergence of new professions and jobs has been continuous throughout history: the invention of mechanical machines, the rise of electronics and inroads made by smart devices have all created new jobs that did not exist before. This is confirmed by Lin (2011), claiming that 18 percent of the jobs at the time did not exist before 1980. According to an estimate by WEF (2020), the new division of labour between humans and machines could affect 85 million jobs, with a potential for 97 million new jobs created in the process.

The pandemic has acted as a catalyst for automation in labour markets. Spreading around the world in the space of a few weeks, the COVID pandemic highlighted the health risks of the human workforce. It was essential to ensure proper disinfection and physical distancing in most workplaces. In addition to short-term adaptation, the pandemic led companies to make decisions that will determine the future of work. This has accelerated and brought forward companies' automation developments. McKinsey (2021) found a close correlation between automation and physical proximity in workspaces. In their July 2020 survey, two-thirds of senior executives reported intentions to step up investments in AI and automation. According to the WEF (2020) survey, more than 80 percent of employers would be ready to move workflows increasingly into the digital space (Chart 4-19). The use of teleworking and digital devices is closely linked, suggesting that as digitalisation becomes more widespread, there would also be more possibilities for teleworking. 50 percent of respondents would accelerate the automation of workflows.



Accelerating automation could create a new division of labour between humans and machines. According to WEF (2020), by 2025, humans and machines could spend approximately the same amount of time working in occupations that we know today. The authors of the survey expect that although the importance of algorithms, programs and electrical equipment may increase in all jobs, their share can only exceed the human workforce in the collection and processing of data and information. The human workforce remains predominant in the areas of management, coordination, and decision-making. Obviously, technological transformation and automation affect different professions to varying degrees (PwC, 2018). In 2017, nearly 8 percent of jobs in the UK were highly exposed to automation, but the exposure varied significantly by type of occupation (ONS, 2019). Elementary activities (shelf stackers, cleaning staff) and process, plant and machine operators' work processes can be automated to the greatest extent, while professional occupations (health and education professionals, lawyers) and management positions are the least exposed (Chart 4-20).



Source: Office for National Statistics.

Automation accelerated by the coronavirus contributes to the polarisation of jobs. Immediate labour market adjustment following the outbreak of the pandemic has severely affected vulnerable groups of society, including low-skilled and female workers. Blanas et al. (2020) and Chernoff and Warman (2020) confirm that automation, which has become so popular during the pandemic, threatens the jobs of precisely those vulnerable groups. The accelerating megatrend of workplace automation may reinforce the polarisation of the labour market, given that in jobs that are more easily automated, the proportion of employees belonging to vulnerable social groups tends to be higher. At the same time, automation accelerated by COVID can lead to an increase in wages (and employment) in professions where new technologies complement employees' skills. Strack et al. (2021) examine the effects of digitalisation and automation on the labour market in the US, Germany and Australia under two pandemic scenarios. In their analysis, they formulate statements based on the assumed

evolution of labour supply and demand in different occupations. They predict that all three countries could face significant labour shortages in computer jobs and managerial posts by the end of the decade.

In the transforming labour markets, new skills and competences are being appreciated. The transformation of the world of work has gone under way during the past two decades, shaped by various global megatrends. While ageing, higher education levels, an increasing labour market participation of women and cross-border labour movement have had a predominantly supply-side workforce impact, globalisation and technological advances have typically affected labour demand. In order to find a new balance, in addition to the transformation of companies, it is also essential for employees' skills and competences to adapt to the new needs (OECD, 2017). While some jobs will be lost as a result of automation, new jobs will be created simultaneously. The transforming labour market requires a different qualification structure than before. The extent of qualification and skills mismatches varies by job, sector and country. In 2016, the qualifications of about 30 percent of those employed in Hungary exceeded or fell short of what is generally required for their work (Chart 4-21). This ratio is lower than the average of the OECD members, but higher than the average of the countries in the region. The shortage or surplus in required skills is mostly determined by signals from the labour market. The processes of employment, job losses and wages affecting different occupational groups all provide an indication of the balance of skills required (OECD, 2017). It is worth noting, however, that the qualifications mismatch does not show a high correlation with the level of economic development. Ireland's GDP per capita is almost double the EU average, yet its qualifications mismatch is similar to that in Greece (66.5 percent of EU development level) or Portugal (79.5 percent of EU development level).



The key factors in the post-COVID period are the acquisition of new skills, lifelong learning by employees, as well as the provision of reskilling and upskilling by employers. Based on McKinsey (2020), the most important skills of the post-coronavirus era may be determined by three main trends: the massive transition of work into the digital space, the change in consumer habits (e-commerce) and the transformation of global value chains (reshoring). As a combined result of these, for many jobs the balance is lacking between the available skills of employees (supply) and the skills sought by companies (demand). As a result of digitalisation, computer and IT capabilities become more emphasised, while creativity or leadership capabilities become valuable precisely because they cannot be automated. The number of workers with increasingly sought-after skills may initially prove limited compared to corporate demands. Both in Hungary and in the EU average, the demand of companies significantly exceeds the supply available on the labour market in terms of the most important capabilities of the post-Covid world, such as stress tolerance, leadership, negotiation, critical thinking, or complex problem solving (Chart 4-22). Reskilling and upskilling play a primary role in

reducing the gap between the supply and demand of skills. According to the survey by WEF (2020), the main obstacles to corporates' adaptation of the latest technologies are the skills mismatch and the inability to recruit qualified labour. In order to provide the skills needed, previously employers provided 62 percent of employees with upskilling opportunities, which would be increased to over 70 percent by 2025. In a transforming labour market, there will be growing demand for employees with increasingly sought-after skills, such as digital and software skills, as well as problem solving and communication. In Hungary, the proportion of the population with basic digital and software capabilities is essentially the same as the EU-27 average, with a slightly higher ratio for problem solving (Chart 4-23). However, the proportion of the population with basic communication skills in Hungary is significantly lower than the average of the European Union and the Visegrad countries.





#### Chart 4-23: Individuals with emerging skills (2019)

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# 5 Impact of the pandemic on global economic networks

The coronavirus outbreak and the efforts to combat it have highlighted the role of global supply chains in the economy. Strict and widespread restrictions imposed to control the pandemic quickly exposed the weaknesses of the current global economic model. Global value chains played a major role in how negative economic effects were spread and amplified. Every global economic downturn is followed by structural changes in the economy, drawing on crisis experience. Accordingly, lessons must be drawn from the events seen in 2020, and the global economic model dominating the past decades must be reconsidered also in the context of global value chains.

The emergence and rapid expansion of global value chains and supply networks since the 1990s has fundamentally redrawn the map of world trade and reshaped the manufacturing industry worldwide. A production process has evolved that is much more fragmented than before, with a shift in focus from the final product to the individual sub-processes, the production of and trade in intermediate products. Over the approximately twenty years up to the onset of the financial crisis, a pronounced readjustment occurred in the global manufacturing industry, giving many developing and middle income countries the opportunity to participate in world trade via global production chains.

Global supplier networks showed a major drop in performance during the financial crisis, failing to resume their previous vigorous expansion even after the recovery. For goods produced in the world, the share of globally absorbed imports did not increase further, but started to contract gradually, accompanied by a variation in the speed at which supply chains developed across countries, indicating the start of readjustment in global value chains in the aftermath of the financial crisis.

The global recession caused by the coronavirus outbreak is very different from the economic crises we have seen over the last hundred years. The decline in production and trade due to restrictive measures caused supply-side problems, which, due to supply disruptions to the trade in intermediate products, spilling over into many parts of the world via global value chains as a "contagion", generated negative feedback through supply chains. As global supply chains are highly efficient and optimised processes, operating with low stock levels and precisely timed schedules, it quickly became apparent that the reserves in the system were insufficient to deal with supply shocks of this magnitude and scope, and supply chains quickly became fragmented. This was compounded by the fact that, in view of the emerging instability and uncertainty, many governments around the world introduced partial or comprehensive trade restrictions on a wide range of products. Although the situation improved considerably by the second half of the last year, the disruptions to the supply chains are still being felt, and calls are becoming stronger for the restructuring of global value chains.

The coronavirus outbreak may clearly act as a catalyst for readjustment in global trade. One of the decisive trends of the period ahead may be stronger regionalisation around manufacturing centres, which will help to shorten supply chains, reduce delivery times and thus mitigate risks. The use of new technologies (increasing digitalisation, artificial intelligence, automation, robotisation) can also be key to reorganising global value chains. The coronavirus pandemic has significantly accelerated digitalisation in all areas of life, and production technologies must adjust to that trend. Since global value chains are in constant motion, transformation may also partly affect location decisions. Hungary was an accentuated target of the foreign capital, which was an incentive for the economy in the crisis, due to the high value and the advanced structure of the capital.

The future development of global value chains will be both a challenge and an opportunity for Hungary and the countries in the region. In the aftermath of the financial crisis, the region gained a significantly stronger position in supply chains. Countries in the region start from a favourable position, as the region continues to be positioned well regarding most of the factors that previously attracted investment. With a proper response to the changing environment, further integration into global supply chains may determine the convergence path of the region. In addition to deepening integration, an important role will also be occupied by the extent to which the countries in the region will be able to increase their share within product chain processes representing higher added value. One of the cornerstones of sustainable economic growth in the next decade is our ability to add value to production and innovation, knowledge to products and services.

# 5.1 The coronavirus outbreak posed new challenges to the global economy

The coronavirus outbreak and the efforts to combat it highlighted the role of global supply chains in the economy. After the emergence of the virus in China at the beginning of last year, it quickly evolved into a global pandemic, to which countries responded by restricting specific areas of life to varying degrees in order to suppress or slow down the spread of the virus. For fear of the unknown, very severe restrictions were imposed initially, which quickly exposed the weaknesses of the current global economic model. A stalling world trade, rapidly fragmenting supply chains, and loss of production for companies producing under the just-in-time (JIT) model and quickly running out of stocks, were all indicative of the problems.

As a result of the rapid corporate adjustment following the "shock" that characterised the second quarter of 2020, the systemic disruptions were overcome for the most part in the second half of the year, and with the range of vaccines available, 2021 is already expected to be a period of economic recovery. Every global economic downturn is followed by structural changes in the economy, drawing on crisis experience. Accordingly, the consequences must be drawn of the events seen in 2020, and the global economic model dominating the past decades must be thoroughly reconsidered also in the context of global value chains.

Already in the decade following the previous financial crisis, Hungary and the countries of the Central Eastern European region became deeply integrated into the global value chains. This trend may continue in the period following the coronavirus pandemic, while the rapidly changing global economic environment and the spread of major technological achievements present significant challenges for economic operators in Hungary and across the region.

# 5.2 Global value chains before the pandemic

International supplier networks have a long history now, but initially the segment was mostly characterised by trade relations only among developed countries. A good example is the "Auto Pact", signed in 1965, which abolished customs duties between the United States and Canada for the uninterrupted cooperation of automotive factories and suppliers. The most developed countries dominated the achievements of early globalisation until the end of the 1980s, with an outstanding economic weight carried by the G7 countries in terms of world trade and GDP (Chart 5-1). The shift from the "north-north" type of trade, dominant up to that point, to the "north-south" type of trade was brought about by the turning point of the '80s and '90s, when global value chains as we know them today began to emerge between countries with advanced technology and nations with low wage costs (Baldwin and Lopez-Gonzales, 2013).



## 5.2.1 DYNAMIC EXPANSION OF GLOBAL VALUE CHAINS: HYPERGLOBALISATION

The emergence and rapid expansion of global value chains and supply networks since the 1990s has fundamentally redrawn the map of world trade and reshaped the manufacturing industry worldwide. The boom in international trade was supported by several converging factors, such as economic and political liberalisation, various trade agreements, the standardisation and reduction of customs and tariffs, and the freer movement of capital and innovation. Another prerequisite was the development and uptake of new technologies that enabled fast and efficient communication (e.g. the emergence of information and communication technologies) and cost-effective transport (e.g. the proliferation of container ships). As a combined result of these factors, a production process evolved that is much more fragmented than before, with a shift in focus from the final product to the individual sub-processes, and the production of intermediate products. In trade, the emphasis has shifted from trade in final products to the supply of raw materials and semi-finished products. By the time a product reaches its final state, the required components may have crossed several national borders in the emerging system of international production sharing.

Box 5-1: Types of global supply chains

Permeating world trade, international production sharing has created a whole range of value chains, which, however, differ in many important parameters. Based on Wang et al. (2017), four types of production may be distinguished (Chart 5-2).

**1) Domestic production** is defined as all activities where both the production and consumption of the product or service take place within the same national borders, e.g. Hungarian sausage sold in the corner shop.

2) A traditional value chain is one where the goods and services produced in the given country cross the national borders, but are exported for the sole purpose of consumption, and the goods shipped abroad are not used to create further added value.

**3)** A **simple value chain** comprises production processes where the intermediate product crosses the national borders once and is consumed locally after processing, such as imported crude oil refined, then sold at petrol stations in the processing country. In this case, therefore, further added value will be generated after the national borders have been crossed.

**4)** A **complex value chain** is defined as production sharing where a semi-finished or finished product crosses national borders in two or more instances. For example, after the design and research phases, the German Mercedes company will use its Kecskemét plant for the assembly of vehicles that will be exported to all parts of the world. In this case, further value will be added at each stage after national borders have been crossed.

For global supplier networks, a distinction should also be made according to where a given country enters the value chain. Based on Wang et al. (2017), two main directions of linkage should be distinguished:

1. During **"backward" participation**, intermediate and semi-finished products are imported, then used for production. This is the level of supplier networks where production and assembly are carried out at the location concerned primarily due to its low labour costs, but the required supplier capacities are not available.

2. By contrast, **"forward" participation** involves a different type of linkage, where intermediate and semi-finished products are exported for final manufacturing and assembly to be completed elsewhere.

These two forms tend to co-occur in a particular country, and the more deeply integrated a country is in the global value chains, the stronger and more important its participation in the export of intermediate products. Successful participants in this segment are primarily companies whose high productivity make them competitive on the international market.

Before the onset of the financial crisis, the output of global value chains accounted for about 13 percent of the added value generated globally, almost twice the share of traditional trade in finished goods, which accounted for 7 percent Chart 5-2. At the same time, more than two-thirds of international trade was conducted through global value chains, mostly in the form of raw materials, parts and semi-finished products, business services and capital goods (OECD, 2020b). Multinational companies, which are closely linked to global supplier networks, accounted for one-third of the world's production, and conducted about a half of global trade (OECD, 2018).



The expansion of global value chains gave many developing and middle income countries the opportunity for economic convergence. Their entry into the world's economic circulation enabled not only the employment of the abundant and cheap workforce available, but also a major flow of capital and technology and know-how to the less developed countries through various channels. Although the companies participating in international trade relied heavily on low labour costs, they were still significantly more productive than local companies. Thus, the emergence of global value chains through ripple effects has improved the capacities of local economies. Over the approximately twenty years up to the onset of the financial crisis, a pronounced readjustment occurred in the global manufacturing industry (Chart 5-3).





However, in global supply chains, manufacturing typically covers the part with lower added value within the entire value chain, with pre-production phases (research and development, design) and post-production phases (marketing, sales, related services) accounting for a larger share of the value added. Between the 1970s and 2000s, this difference continued to increase partly because by relocating production to countries with lower wage costs production-related costs could be reduced, while activities at the beginning and end of the product chain typically remained in developed countries (Chart 5-4).





#### Source: OECD.

A supplier strategy built on low relative wage cost will, consequently, lose momentum over time and, without internal growth based on innovation, the growth momentum of developing and middle income countries may decelerate. In addition to the inflow of capital, it is therefore important to make the best possible use of the human capital and know-how received, and to improve the country's so-called absorption capacity, which depends on the amount of human capital available, physical, and financial infrastructure, macroeconomic stability, and the institutional system (Balatoni and Pitz, 2012).

#### 5.2.2 IN THE AFTERMATH OF THE FINANCIAL CRISIS, THE GROWTH OF GLOBAL VALUE CHAINS STALLED

Global supplier networks showed a major drop in performance during the financial crisis, failing to resume their previous vigorous expansion even after the recovery (Chart 5-5). Before the crisis, the annual growth of world trade significantly exceeded the growth of world GDP, the contribution of trade to the world's added value was very significant. However, this fast-growing phase of trade ended with the financial crisis, and although some recovery was apparent at the end of the 2020s, global value chains once again faced challenges due to the coronavirus pandemic.



In addition to the slowdown in world trade growth, global production also changed in other respects: for goods produced in the world, the share of globally absorbed imports did not increase further but started to contract gradually (Chart 5-6). This led to a decrease in the volume of foreign inputs used in production, and other indicators point to shortened supply chains, mainly in international terms (OECD, 2020a).



Note: This indicator takes into account all trade flows of intermediates inputs used in any stage of the value chain, and expresses their overall value as a share of the final output. Calculated for the world, it measures the overall level of fragmentation of production. Source: OECD TiVA, Comtrade, IMF.

However, changes in global value chains proved to be heterogeneous, with countries at different levels of development being affected differently. Following the crisis, high-income countries saw the fastest recovery in the function of supplier networks, with substantially deepened supplier relations after 2011. Outstanding among these countries are the countries of the Central and Eastern European region, which significantly increased their weight in global supply chains. By contrast, middle- and low-income countries are obvious losers of the readjustment occurring in the global value chains after the financial crisis, the decline being particularly apparent in Asian countries (World Bank and WTO, 2019).

Changes in global supply chains are attributable to several factors. The first waves of the financial crisis were followed by a major downturn in the real economy, as indeed every economic downturn will necessarily entail a partial restructuring of the economy in response to the preceding events. In the short term, changing supply and demand conditions led to a significant decline in global trade and broken supply chains were not necessarily restored to their exact pre-crisis condition. The new economic boom made it possible to rethink existing supply chains, to involve new partners, enabling the entry of new domestic players, thereby shortening supply chains and reducing trade conducted along value chains.

Highlighted in the context of the financial crisis, the issue of financing trade flows in global supplier networks may be a key consideration. The establishment and operation of a complex supplier network involves a high financing requirement, with each member of the chain simultaneously building up significant exposures on both sides of their balance sheets. Where a company's own funds are insufficient, short-term bank loans are introduced into the financing process.

The longer the supply chain, the more the entire production process needs to be financed, which in turn requires sufficiently liquid financial markets and low financing costs in order to run smoothly. If lending conditions are tightened and funding sources are scarce or more expensive, or delivery periods are prolonged and financing slows down as a result, the supply chain in its earlier form may prevent some companies from finding sustainable and alternative sources of supply. Involving local suppliers or partners located geographically closer (onshoring, reshoring, nearshoring) can help streamline the supply chain.

#### Box 5-2: The main forms of global production sharing

Global supplier networks emerged because of international production sharing. Companies have reorganised their operations in a variety of ways in recent decades and it is important to distinguish between the different forms of outsourcing (Chart 5-7). A company can organise the input required for a production or the production process itself in two ways: either by producing it internally, or by purchasing from a supplier. Another important decision involves the choice of location: the activity can be carried out at the company's premises or at another location, which can be within the country of the company, or at a remote site overseas. The dominant outsourcing strategy in the decades preceding the financial crisis was primarily offshoring within companies to external low-wage locations. However, in the last decade, the slow transformation of supplier networks began, which may continue in the period following the coronavirus pandemic. The possible reshoring (also frequently referred to as backshoring or onshoring) of previously outsourced production capacities to the country of origin is being increasingly discussed in the literature. Expectations are that reshoring may, rather than to the country of origin, be directed at a geographically close country (nearshoring), strengthening the regional nature of the supplier networks.



According to a study by experts at the BIS, the banking sector finances about 35 percent of trade, while the remaining 65 percent is managed by the companies, using their own capital. The US dollar plays a key role in bank financing, with about 80 percent of bank loans used in trade being denominated in dollars (BIS, 2014). Therefore, dollar lending is an important link in the operation of global supply chains, and movements in the dollar rate may thus be a good indicator of the evolution of lending terms. There is a surprisingly strong correlation between movements in the dollar rate, the volume of dollar-based loans disbursed in developing countries, and the evolution of global trade, as highlighted in his presentation by BIS Director of Research Hyun Song Shin in 2019<sup>13</sup> (Charts 5-8 and 5-9).





Although the exchange rate alone does not explain the decline in trade by global value chains, it underlines the importance of financing. Experts with BIS and the IMF have

13 Hyun Song Shin (2019): What is behind the recent slowdown?

pointed out the relationship between trade and its financing in several of their writings (BIS, 2018; Garralda and Vasishtha, 2019; and BIS, 2020).

The dynamic expansion of global supply networks before the financial crisis is likely to have benefited greatly from an abundant and cheap supply of funding, which became considerably tighter during the crisis and in subsequent years, and this may have contributed to the shortening of supply chains and the reduction of the volume of trade flowing through them over the last decade.

The reduction in trade is also commonly explained by changes in the political environment after the crisis. The economic effects of the crisis, along with a protracted recovery, weakened the previous pro-globalisation environment in a political sense. Ongoing trade negotiations lost momentum or were temporarily postponed, giving rise to protectionism favouring domestic production (see the UK's exit from the European Union and US trade disputes with China). In the case of global supply chains, these developments may take the form of potential supply risks, which can be addressed by shorter supply chains and by prioritising domestic partners or partners in closer locations.

## 5.2.3 THE ROLE OF THE CCE REGION IN GLOBAL VALUE CHAINS

In addition to understanding global processes, it is important to evaluate the performance of both Hungary and of the local region in relation to global supply chains. Eastern and Central Europe has gradually become deeply integrated into global supplier networks over the past two decades. A major driver of that process was the accession of the countries of the region to the European Union, which deepened economic integration and facilitated trade with the other Member States. Through investments relying on the steady inflow of foreign capital, several large multinational companies established themselves in Hungary and in the countries of the region, also connecting a significant number of domestic suppliers to the global supply networks.

As value chains stagnated or diminished worldwide after the financial crisis, countries in our region became increasingly involved in global supply chains and were able to increase their share compared to pre-crisis levels (Chart 5-10, Endrész, 2020).



The figure shows that the CEE region significantly exceeds the values of the world and the EU in terms of both "backward" (imports of intermediate goods, semi-finished products) and "forward" (exports of intermediate goods and semi-finished products) suppliers. Following the financial crisis, the region's participation in global cooperation rose to new historic heights (Chart 5-11). This dynamic may be explained from several angles, by reference to factors that have already been mentioned in a global context. The recovery of the international networks after the crisis took place unevenly, where the ability to make a rapid recovery and gain further share was largely limited to developed countries, with the Central and Eastern European region standing out among these countries.



The readjustment of international networks following the financial crisis appears to have put the countries of the regionalising value chains moving towards shorter supply networks, countries of Central and Eastern Europe, linked to the German economy through an increasing number of ties, rose to a more prominent role. It is important to emphasise, however, that integration into supplier networks varies considerably at sectoral level, with regional participation concentrated primarily in some key sectors. Furthermore, the current integration largely affects the lower value added segment of the production chain, allowing room for participation in higher value added processes.

### 5.3 How has the coronavirus affected global supply chains? Direct effects and lessons learned from the pandemic

The global recession caused by the coronavirus outbreak is very different from the economic crises we have seen over the last hundred years. Global value chains may have played a major role in how negative economic effects were spread and amplified. Based on information currently available, the coronavirus outbreak starting from China in December 2019 quickly spread worldwide, which was primarily accelerated by international passenger traffic connecting all parts of the world. Following the spread of the epidemic, most affected countries affected took strict measures to slow down or suppress the spread of the infection. Diverse measures ranged from the complete closure of regions or entire countries to the closure of schools and non-essential shops and services, to different forms of social distancing, which directly or indirectly influenced both the demand and supply sides of the domestic economy, therefore also affecting trade.

In their studies, Baldwin and Freeman (2020), Fried and Zhang (2020) and Kejvar and Velic (2020) pointed out that

global trade is negatively affected by the epidemic through three mutually reinforcing channels: supply problems due to domestic closures, a "contagion effect" spreading through global value chains due to supply disruptions in the trade in intermediate products, and declining global demand due to a drop in consumption activity and postponed investments.

#### Box 5-3: Resilience of global supply chains

Shortly after the coronavirus outbreak, the system of supply chains permeating world trade became severely broken. Ten years ago, Asia was hit by two major natural disasters: the earthquake in Japan and flooding in Thailand, which had similarly significant negative effects on supply chains in the short term. The lessons learned from the period following the disaster may be relevant to the post-coronavirus era.

The tremendous earthquake that hit Japan was the fourth largest registered in the world since 1900, yet Japanese companies proved extremely resilient. Studies by Todo et al. (2015, 2017) found that the majority of companies resumed business in three months following the earthquake. Overall, companies with wider supplier networks were able to restore their operations more quickly. Some of the Japanese companies changed their operating model: Zhu et al. (2017) found that the companies in the area hit by the earthquake preferred to outsource their activities more significantly, while in general, manufacturing companies sought to expand and diversify their supplier base in the aftermath of the earthquake.

The 2011 flood in Thailand significantly affected hard disk manufacturers, as at that time nearly half of the world's HDD production was concentrated in the valley of the Chao Phraya River, which was hit by the floods. In their 2015 study, Haraguchi and Lall pointed out the variety of the responses to the natural disaster by the large corporates affected. The US company Western Digital's plants were located near the waterfront and were completely inundated, Seagate's plants were located higher and went unharmed, while Toshiba suffered damage to some of its plants. In view of the changed situation, Seagate became the largest hard drive manufacturer in 2011, but Western Digital needed only six months to regain its market leadership. With the help of Thai Navy divers, they salvaged most of the company's production equipment and resumed production 46 days after the events. In Thailand, things worked out for Western Digital so well that later, in 2017, its Malaysian operation was also transferred here. Meanwhile, Toshiba took a different path, giving up its plants in Thailand and relocating production to the Philippines.

The problems on the supply side are therefore complex, with restrictive measures periodically interfering directly with factories and production, triggering a decline in supply by domestic exporting companies, with a simultaneous fall in demand for imports. The first and extremely stringent measures were introduced in China at the end of January 2020, which had a conspicuous and strong impact on domestic production and trade on both its export and import sides (Charts 5-12 and 5-13).



Note: Monthly data, seasonally adjusted, US dollar, constant price, last data point: 2020 June Source: World Bank GEM database.



rurary and 2019 January/Februrary: Source: China Customs. Subsequently, the sharp decline in trade generated negative feedback through supply chains, irrespective of the measures in place in other countries. On the one hand, through the low inventory level of supply chains, the fall in Chinese exports was capable of disrupting production within a short time elsewhere in the world. This in turn spilled over to successive members of the supply chain, down to the manufacturer of the final product. Similarly, the fall in Chinese demand for imports put China's suppliers in a difficult situation, with repercussions up the supply chain. This mechanism was further exacerbated by the fact that the rapid deterioration in expectations regarding the economic outlook led to a further decline in demand in the supply chains; manufacturers began to cut orders from their suppliers. The negative economic shock rippling across the supply chains spread very rapidly and widely, even before consumption and investment demand actually declined as a result of the closures and negative effects on the real economy.

Global supply chains are highly efficient and optimised processes, operating with low inventory levels and precisely timed schedules. As a result of the supply problems originating in China, it quickly became apparent that the reserves in the system were insufficient, and supply chains quickly became fragmented. This was compounded by the fact that, in view of the instability and uncertainty, many governments around the world introduced partial or comprehensive trade restrictions on a wide range of products, while a general shortage emerged of the means for protection against the epidemic (Chart 5-14).



Chart 5-14: Temporary export restrictions by product

groups and number of countries

#### Source: WTO.

However, the tense situation gradually eased over the course of a few months, with supply networks reconnecting and a recovery of industrial production and trade starting in most countries in the second half of the year. Several factors contributed to the partial improvement in the situation. To start with, China suppressed the outbreak with extreme rigour, so that production quickly returned to its pre-pandemic levels and exports were resumed. In the area of medical equipment, this came as a major relief for many countries. Simultaneously, industrial companies around the world adapted to the changed health situation, converting their factories and plants in accordance with the health requirements in place. Following the initial downturn, manufacturing production gradually returned to normal globally from the summer months onwards. The second wave of the pandemic and the subsequent lockdowns were weathered by the supply side of industrial production better than expected, a likely result of stronger demand compared to the first half year. After the spring lockdowns, household consumption habits adapted to the changed environment, contributing to the fact that in the fourth quarter the economic indicators developed slightly more favourably than expected.

Nevertheless, world trade suffered a significant downturn in 2020, and the subsequent recovery may also be cautious, involving many uncertainties. The WTO expects global trade to have declined by around 9.2 percent last year, which may be followed by growth of 7.2 percent this year (Chart 5-15). Although the outlook for the global manufacturing industry is favourable, some sectors (semiconductors, chips, maritime transport) continue to experience disruptions in the field of trade and the recovery of global supply chains may also take longer in certain areas (WTO, 2020).



#### Box 5-4: Turbulences in global supply chains

Although the global supplier network started to reconnect after the first wave of the coronavirus pandemic, the anomalies in several sub-markets highlight the complexity of international trade. The fact that some parts of the world have recovered from the initial economic downturn at different speeds against the backdrop of their different epidemic situations may lead to further problems.

A major slice of world trade is conducted via maritime container carriers capable of moving goods slowly but in massive quantities. However, from the second half of 2020, the maritime transport industry faced increasing supply problems, as a result of which the rental price of shipping containers multiplied many times over. Before the coronavirus pandemic, preparations for Brexit and Chinese-American trade tensions caused problems in relation to maritime logistics, which escalated further after the outbreak of the coronavirus. Following the outbreak, Chinese industrial production declined and the volume of maritime transport slowed due to closures in China. Simultaneously, consumer demand also changed, products for working from home, home renovation and home entertainment became more prominent. Once supplier networks were restored, demand quickly exceeded the available transport capacities, which was compounded by the fact that some of the available containers were in ports from which no shipments were foreseen. According to industry experts, soaring container prices will persist until the end of 2021, and this anomaly in maritime transport highlights the significant impact of the collapse of the distribution chains in early 2020.

The global microchip shortage emerging at the beginning of this year, forcing car manufacturers to shut down for shorter periods, is another symptom of the supply and production capacity anomaly caused by the coronavirus outbreak in the economy. The shortage is partly due to the increase in demand for consumer electronics in 2020, causing some of the chip manufacturers to switch to serving the industry with the stronger demand. Furthermore, demand for new cars recovered faster than expected, but as car manufacturers have already reduced their orders for chips, now it takes some extra time for new orders to be delivered. Expectations are that the microchip market will soon be able to overcome the difficulties encountered at the beginning of the year, enabling this segment of the supply chains to operate at full capacity.

### 5.4 Potential transformations in global supply chains after the coronavirus pandemic

The coronavirus outbreak has intensified the risks associated with global value chains and is likely to be considered a rare "black swan" event. The epidemic revealed that similar types of events with a low probability of occurrence, but significant negative effects (further epidemics, the impact of climate change) may also lead to temporary disruptions and even the collapse of the system. The slow readjustment of global supplier networks may already have started before the coronavirus outbreak, with developments in the period following the financial crisis substantially differing from those preceding it. The supply networks have had a significant share in the negative economic effects of the current pandemic, acting as transmitters and catalysts of the problems through stalling trade. In relation to the temporary fragmentation of value chains, the need for a future transformation of global supply chains increasingly became a matter of discussion in professional and policy workshops already in the first half of 2020. The outbreak may clearly act as a catalyst for readjustment in global trade, but this may occur primarily in conjunction with the trends previously seen, as cost-effective production will remain a priority for companies. A narrow segment of sectors may change in direct relation to the coronavirus, and government involvement in healthcare-related products is expected to increase efforts to ensure the security of supply.

#### 5.4.1 NEW TRENDS IN THE TRANSFORMATION OF GLOBAL VALUE CHAINS

Recognising the risks in global supply networks may trigger a shift in the world's manufacturing and trade towards new strategies and technologies. Although a major proportion of the companies adapted well to the changed situation in a short period of time and after a few months production gradually recovered in most segments, it is not yet fully clear how great a role the emergence of new suppliers and the application of alternative solutions may have played in this regard. In the aftermath of the financial crisis, it was already apparent that excessively long supply chains, trade financing, dependence on a single supplier, and production with low inventory levels could all pose risks, and that the expected transformation of global supply networks would mainly address these challenges. One of the major trends of the period ahead may be stronger regionalisation around manufacturing centres, which will help to shorten supply chains, reduce delivery times and thus mitigate risks. Global value chains are composed of three major regional networks (Factory Europe, Factory America, Factory Asia, based on Baldwin and Lopez-Gonzales, 2013) and most trade flows in terms of trade volume are carried out at regional level. Although the role of China has increased steadily over the past decades, this is precisely how certain supply chains may become excessively long and, as the case may be, too risky.

More regionalised supply chains and production may give more prominence to the concept of local production, which played an increasing role already before the crisis. While the first, rising phase of global value chains was dominated by the strategy of outsourcing production to cheaper locations and re-exporting finished products, this gradually changed. The trend was started partly by China, developing fast and evolving into an important market, along with Asian countries, given that the German car factories in China, or the Gigafactory built by Tesla, for example, produce primarily for the local market. There are also plenty of examples for production outsourcing in the opposite direction, with an increasing number of Asian companies setting up factories in Europe, for example, to meet demand here directly. This trend may become more pronounced in the near future, and companies on the global market may diversify their production with local production and regional suppliers.

At the individual corporate level, a multi-level strategy can help to mitigate risks in the supply chain, comprising the diversification of the supply chain, exploring new markets for own products, and a different inventory management. Companies in supply chains are exposed to a significant risk from relying on a single supplier (possibly the most favourable in terms of price) for inputs required in production. Finding alternative sources during a crisis is a big challenge, which, looking ahead, may prompt many companies to source the necessary inputs from multiple suppliers. The potentially higher price may be compensated by the lower operational risk in the event of any transport turbulence. Change in the practice of inventory management may be driven by similar strategic considerations. Currently, with the help of a highly optimised supply chain, production is carried out at minimum inventory levels, whereby even minor transport difficulties will lead to temporary stoppages in production. Looking ahead, production at higher inventory levels is likely to become the norm, but the additional financing required will also add to the costs of companies. The third potential strategy is the diversification of the distribution base, as in many cases a significant part of a supplier's revenue is covered by a single large partner. An ideal environment for finding new markets for products could be provided when supply chains become shorter and more regional where operators try to source their inputs from a variety of suppliers.

The use of new technologies can be key to reorganising global value chains. The coronavirus pandemic has significantly accelerated digitalisation in all areas of life and production technologies must follow up on that trend. Companies that are competitive on the world market comprise the most productive segment of the economy. This is especially true for companies in global value chains, where cost-effectiveness is a determining factor in competition on the market. Technological solutions partially or completely replacing the workforce already began to spread widely before the coronavirus outbreak: automation was stepped up, industrial robots were deployed in increasing numbers, and advanced artificial intelligence solutions were introduced (Chart 5-16).



Source: International Federation of Robotics.

Social distancing due to the pandemic and the minimisation of human contacts have shifted the focus to the use of technological solutions. Some areas saw accelerated deployments of previously untested tools, as the epidemic forced more dynamic innovation than previously planned. Successful technological developments will not be put back into their boxes after the pandemic is over; on the contrary, their dissemination is expected to continue due to their efficiency. Automation and robotisation and similar solutions to replace human labour are needed to transform global value chains, as current networks have largely emerged on the back of low labour costs. The improvement in productivity through capital intensity will in the near future affect an increasing number of manufacturing sectors, which may also change the demand for jobs in companies. Fewer but better-trained workers may be needed for more automated factories in future, and this may also pave the way for partial relocation of industry.

## 5.4.2 RELOCATION IN GLOBAL SUPPLIER NETWORKS

A recurring lesson in analyses of the coronavirus pandemic is that some of global production could be brought closer in some way or even fully repatriated to its country of origin. The pandemic itself has not changed the conditions under which global value chains have emerged, but the combination of cost-effectiveness and other new technologies may result in a much more dynamic readjustment in the geographical location of production units in the future. Global value chains are in constant motion, and the constant change in the factors that shape them is forcing companies to reassess their supplier relationships and optimise production processes, which includes location decisions.

The North-South type of vertical integration seen at the time when global value chains emerged is no longer valid today, as the picture has become much more complex. Offshoring or outsourcing, which can now be considered as traditional, remains the most dominant form of international division of labour despite all other considerations, and is not expected to change in the short term. The most labour-intensive sectors and production processes may continue to be located in countries with low wage costs and a supportive environment. The manufacturing capacity previously relocated abroad will not be reshored in unchanged form to developed countries, as this would render it uncompetitive.

Nevertheless, there are signs that a combination of new technology solutions and changing global value chains (with supplier networks becoming more regional and shorted, the need for more local production) might success-fully compete with the traditional low-cost production model. Industrial robots and other automated production processes require a different, more skilled workforce than before, which is available in larger numbers in developed countries. This enables part of the production to be moved back to the original country (reshoring, onshoring), or to a country in the same region with even more favourable parameters (nearshoring). This type of readjustment, however, requires significant investment, as the new production technology must demonstrate a similar level of productivity to that of a country with low labour costs.

#### 5.4.3 THE ROLE OF HUNGARY AND THE CEE REGION IN TRANSFORMING GLOBAL SUPPLIER NETWORKS

The future development of global value chains will be both a challenge and an opportunity for Hungary and the countries in the region. In the aftermath of the financial crisis, the region gained a significantly stronger position in supply chains. The combination of a favourable geographical location, the proximity of Germany, excellent infrastructure and skilled but still cheap workforce has made the Central and Eastern European countries an attractive investment destination, and thus the recipient of a major inflow of foreign working capital in the last two decades. In addition to European, mainly German-oriented, investors, there have been an increasing number of Asian companies seeking to produce for local European markets in their factories. In the Hungarian context, mainly South Korean and Chinese companies have invested in the recent years and additional processing capacity is expected to be built in the foreseeable future.

Countries in the region start from a favourable position, as the region continues to be positioned well against most of the factors that previously attracted investment. The shift towards shorter, more diversified, and more regionalised value chains is expected to benefit the countries of the region. They may be attractive targets for nearshoring, as the wage level is still lower compared to the most developed Western European countries, and a similarly qualified workforce is available to operate a more automated and robotised manufacturing industry.

The challenges faced by the region share their underlying reasons with potential benefits. Lower wage levels mean less productive companies in other segments of the economy that are not currently integrated into global supplier networks. Deeper integration requires the emergence of additional domestic suppliers that compete with their global partners in technology and productivity. Capital-intensive production requires significant investment in new technologies, while threatening a certain group of workers who can only be employed by companies using the current technology (Chart 5-17).

#### Chart 5-17: Automation potential



It is an important challenge for the countries in the region to integrate more deeply into the supplier networks, primarily in the direction of processes with higher added value. Processing industries in global value chains typically comprise the lower value added part of the entire value chain. For the countries of Central and Eastern Europe participating in supply chains, it is a clear objective to gradually engage in increasingly complex processes with high added value. This requires a new type of approach, innovative companies, incentives for research and development, and highly skilled workers.

Therefore, the period ahead will be of outstanding importance for Hungary and the countries of the region, as with a proper response to the changing environment, further integration into global supply chains may determine the convergence path of the region. The economic policy challenges are diverse, with the simultaneous needs to create an attractive and predictable investment environment, to encourage major improvement in the practices of the domestic business community, and to adapt to the labour market needs that change in parallel with the technology, using the currently available resources.

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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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