

# FINTECH AND DIGITALISATION REPORT



2022 JUNE "It would appear that we have reached the limits of what it is possible to achieve with computer technology, although one should be careful with such statements, as they tend to sound pretty silly in 5 years."

John von Neumann (1949)



# FINTECH AND DIGITALISATION REPORT



Published by the Magyar Nemzeti Bank Publisher in charge: Eszter Hergár H-1013 Budapest, Krisztina körút 55. www.mnb.hu ISSN 2732-3145 (print) ISSN 2732-3153 (on-line) Without prejudice to its primary objective – to achieve and maintain price stability – the Magyar Nemzeti Bank shall support the maintenance of the stability of the financial intermediary system, the enhancement of its resilience, its sustainable contribution to economic growth; furthermore, the MNB shall support the economic policy of the government using the instruments at its disposal.

A high level of digitization and financial innovation contributes to achieving these goals, therefore the MNB considers it especially important to develop the digitalisation of the financial system and support the market introduction of innovative financial services in a secure way.

The MNB favours a financial intermediary system that offers competitive and safe financial services to domestic consumers. To this end, the central bank is actively involved in developing an efficient incumbent segment that implements advanced technologies, a vibrant FinTech ecosystem, a supportive environment and a modern regulatory background, while maintaining market integrity.

The MNB's annual FinTech and Digitalisation Report seeks to provide insight into recent domestic and international developments in financial innovation, digitalisation and their underlying technologies, which are becoming increasingly dominant in the Hungarian financial markets. In this way, the MNB intends to contribute to strengthen the digitalisation level of the domestic financial system, to which it intends to provide active support.

The analyses in the Report were prepared under the direction of Anikó Szombati, Executive Director for Digitalization and FinTech development and Chief Digital Officer in the coordination of Digitalization Directorate. The Report was prepared by staff at the MNB's Digitalization Directorate, Directorate of Supervisory Coordination, Directorate Credit Institutions Supervision, Directorate Insurance and Pension Funds Supervision, Directorate Financial Infrastructures, Directorate Financial System Analysis and Prudential Modelling and IT Supervision Directorate. The main content of the publication was approved by the Financial Stability Council.

The Report incorporates valuable input from other areas of the MNB and the comments of the Financial Stability Council.

The Report is based on information available for the period ending 31 March 2022.

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# **Executive summary**

The MNB publishes the FinTech and Digitalisation Report on an annual basis to provide an overview of global and domestic financial digitalisation processes. Digital and innovative solutions, and the advanced technologies supporting them, are becoming increasingly important for the functioning and development of the financial system. On the one hand, financial innovations for customers and institutions can be traced back to the classic, long-established players in the financial market, the so-called incumbents, and on the other hand, new market players—either startups or large technology companies not previously active in financial intermediation—are increasingly involved in such developments. FinTech solutions are also present in Hungary and new service providers are increasingly emerging: in addition to the incumbent players that dominate the domestic financial market, there are already nearly 150 companies registered in Hungary that are dedicated to FinTech activities. In this report, we consider the latter group of individually identified companies to be the domestic FinTech sector.

The FinTech and Digitalisation Report focuses on four main areas. The report starts with a short overview of the most recent international developments on financial digitalisation processes and the global FinTech scene. Following that, we provide a comprehensive analysis of the domestic FinTech sector based on publicly available data. In the third chapter of the report, we summarise the results of the digitalisation survey currently conducted among Hungarian banks—also comparing them with the results of previous years—highlighting the areas where further progress is needed, either through internal or external developments, or through partnerships with FinTech companies, to provide better and more accessible, more competitive digital financial services. The report concludes with an assessment of the digital development of the Hungarian insurance sector based on the results of a comprehensive digitalisation survey.

Although international digitalisation processes were already accelerating even in the first year of the COVID-19 pandemic, the digital transformation of the financial sector gained new momentum in 2021. The COVID-19 pandemic, and the surge in digitalisation that accompanied it in the expanding range of financial services, has led to an increasing openness—and in many cases, increasing expectations—on the part of customers to use digital solutions. However, many consumers still demand a personalised service, or at least a hybrid service offering both online and face-to-face contact, so service providers need to take this into account when operating and developing their interfaces. In the international context, the importance of financial and digital inclusion has also been brought to the fore to avoid the exclusion of consumers without access to digital solutions, so has sustainability become a strategic issue, even through targeted digital developments. In this changed environment, innovative investment platforms and alternative online financing solutions based on advanced technology as well as ecosystems and so-called super-apps, have also gained popularity. The management of cybersecurity risks and the adequacy of data management processes are particularly important issues in the context of accelerating digitalisation. Regarding the latter, 2021 also brought concrete regulatory actions. In addition, a growing number of central banks are considering the introduction of central bank digital currency, which could have a significant impact on the innovation and functioning of the financial system.

The expansion of the domestic FinTech sector, which primarily provides B2B (business to business) services, continued after the outbreak of the coronavirus. The data for the 2020 financial year shows that, despite the general economic downturn caused by the coronavirus pandemic, the domestic FinTech sector continued to grow in terms of revenue and profit, continuing the upward trend of recent years. Small businesses continue to dominate among FinTech companies operating in Hungary: almost 80 per cent of the sector is micro or small, but uniquely, many FinTech companies in Hungary are already profitable as micro-enterprises. Furthermore, the operating results of small firms clearly show that high-value-added firms are also increasingly active in export activities. Domestic FinTech shave a predominantly B2B ("business to business") business model, with the most common services in the sector being financial software development and systems integration, payment services, and data analytics and business intelligence. An analysis of the ownership in the FinTech sector in Hungary reveals that one in four FinTech companies in Hungary has already received venture capital investment. The number of people working in the sector has also increased in recent years, with the number of persons directly employed by the sector reaching over 8,000 by the end of 2021.

According to the MNB's comprehensive banking system digitalisation survey, the digital maturity of domestic banks continued to improve during 2021, but the banking system as a whole has not yet exceeded the medium level of maturity. The MNB conducted its digitalisation survey among banks for the third time, covering more than 90 per cent of the domestic credit institutions in terms of balance sheet total. The level of digital maturity of the surveyed institutions has continued to improve; credit institutions at the forefront of digitalisation continued their improvement and the catching-up of less digitalised banks could also be observed in 2021. Digital developments mean that digital access to certain banking products is increasingly becoming a basic service, while netbanking and mobile banking platforms have become the main channels for customer communication, enabling, for example, more than two thirds of retail customers to receive their bank statements in digital format. At the same time, the share of branch-only banking has dramatically fallen while the share of omni-channel customers has increased sharply among the general public. Virtually all corporate customers use digital channels now. However, in addition to making products and services available remotely and digitally, banks should place greater emphasis on making the signals and notifications to customers about services they already use more digital and even automated. In terms of overall banking operations, we consider it an important step forward that, based on the MNB's expectations, institutions have prepared digital transformation strategies and started to implement them. One of the most important developments is that almost all domestic banks now have a dedicated manager responsible for digitalisation at board level. Beyond the areas specifically responsible for digitalisation, other dedicated teams within the institution are now actively contributing to the achievement of digitalisation goals, for example, user experience (UX) focused design has become commonplace. In the past year, however, there was little progress in the level of digitalisation of internal operations, where improvements and modernisation are needed as soon as possible. It is encouraging that the openness to cooperation with innovative players is growing—at a slow pace though—and domestic banks are actively seeking opportunities to cooperate with FinTech companies. Another positive development is the generalisation of flexible working and the substantial improvement in the efficiency of the organisation of work in the sector.

The digital development of the domestic insurance sector has improved compared to a year ago, but on the whole, it is still at a medium level, similar to banks. There may also be substantial differences in the level of digital maturity of domestic insurers, partly due to the different weight of life and non-life products in their portfolios, which also leads to substantial differences in the level of digitalisation of sales and service channels. Although there was no improvement in the online availability of insurance products in 2021, the sector continues to perform well on the whole, with the online application of retail property insurance being the most accessible for customers. In relation to other external stakeholders, the relationship with business partners is also increasingly going digital, but domestic insurers are less likely to develop partnerships with innovative companies. There is a need for a full organisational commitment to digitalisation on the part of the institutions, predominantly at management level. The picture is positive for digital competences in the workforce and initiatives to support their enhancement. The digital development of the insurers' internal systems is also considered to be good, with institutional core systems characterised by high data transmission speeds. However, improvements in both digitalisation and automation are needed in the area of communication between systems and internal processes, and more extensive use of cloud services for data management could further support the more efficient functioning of institutions.

# **1** International developments

Following the exceptional year of 2020 caused by the COVID-19 pandemic, the financial sector was reinvigorated in 2021. Closures and uncertainty have driven financial service providers to be flexible and to innovate digitally. The banks have continued to digitalise their products and services to meet customer needs, increasingly in cooperation with FinTech firms. The consumers are also increasingly open to using digital solutions, although many still prefer face-to-face, or at least hybrid, interaction that allows both face-to-face and online contact. The importance of financial and digital inclusion has also been brought to the fore to avoid the exclusion of consumers who do not have access to digital solutions. In recent years, more and more banks have focused their strategies on sustainability, which is implemented often in partnership with FinTech companies. In this changed environment, innovative investment platforms and alternative financing solutions based on advanced technologies have become very popular. The proliferation of ecosystems and super-apps has continued, and in line with this, the issue of making provisions in respect of data is becoming more and more common. In 2021, a record amount of investment flowed into the global FinTech sector and a significant number of FinTech companies crossed the 1 billion dollar mark to become unicorns. The acceleration of digitalisation in the wake of the coronavirus pandemic continues to pose a high cybersecurity risk for financial sector. From a regulatory perspective, a new development is that in 2021, specific regulatory steps have been taken to address the competition and data protection aspects of Big Tech firms and to keep the financial services of Big Tech and FinTech firms within an appropriate framework.



Chart 1

Note: In the proportion of respondents. 60 European banks from 11 countries participated in the survey.

Source: Roland Berger (2021): Is digital transformation picking up momentum in retail banks, and what is the impact of Covid-19? (4th European Retail Banking Survey).

## 1.1 THE IMPACT OF THE PANDEMIC ON DIGITALISATION, THE FINTECH SECTOR AND ITS GROWTH

In the prolonged pandemic period, consumers have become increasingly accustomed to using digital solutions, and the financial sector is innovating to meet a wider range of needs. The use of digital channels and contactless solutions has become more widespread, with services available online and alternative financing methods becoming more widespread. Both financial service providers and consumers have adapted well to the changed circumstances. During the pandemic, banks expanded the digital and fast accessibility of their services<sup>1</sup>. This can be seen most clearly in the case of consumer credits, but other credit products are also showing spectacular progress (Chart 1).

In the second year of the pandemic, digital channel usage is more prevalent, but after the surge in 2020, it became more difficult to acquire new digital customers in developed countries and it became important to retain the customers that are less digital. With the return of the option to make transactions physically, customers who had only used digital channels out of necessity were able to return to traditional ways of doing business, which they still find more convenient, in many industries. In the financial sector, this rearrangement was less pronounced, and the

<sup>1</sup> Digitalization in retail banking | Roland Berger

Change expected by consumers in their digital channel usage per industry after the COVID-19 pandemic



Note: Average of the countries surveyed: Brazil, China, European countries, India, Mexico, and the United States.

Source: McKinsey (2021): What's next for digital consumers (Global Digital Sentiment Insights Survey).



Source: BCG (2021): FinTech Control Tower.



Source: Citi GPS (2020): Banking the next billion.

use of digital channels is expected to continue after the pandemic (Chart 2), supplemented by physical visits where necessary. Financial service providers, in particular banks, also need to further improve the quality of their physical service, in addition to further developing their digital channels. This will require modernising the branches, improving the personalised experience and ensuring the interoperability between physical and digital transactions, both to retain less digitally active customers and to support those parts of the process that require a personal presence (the so-called "phygital" model).

# **1.2 THE CONDITION OF THE FINTECH ECOSYSTEM**

Even during the pandemic, the global FinTech market has grown, but in order to succeed, the FinTech companies have to respond to new challenges and changed circumstances, in addition to the digitalisation of classic financial processes. While the number of FinTech startups have grown in all regions in recent years, the Americas have continued to dominate (Chart 3). In the aftermath of the Coronavirus, the areas prioritised by financial service providers have also become a priority for FinTech firms. In the recent past, there has been a focus on solutions that promote financial inclusion (or prevent exclusion), initiatives towards sustainability, and the development of ecosystems and their associated super-apps to serve a wide range of consumers and diversify services and revenues.

The advance of digitalisation requires both digital and financial inclusion, as the operation of digital financial solutions introduced during the shutdowns is the most effective when they are accessible and used by the widest possible range of society. Financial and digital inclusion is a priority in both developed and developing countries (Chart 4), with different focuses depending on the country's overall digital development and other specificities. For example, it may come as a surprise to many that more than 5 per cent of households in the US are unbanked, and a further 20 per cent have a bank connection but are unable or unwilling to use it on a daily basis, primarily for financial reasons<sup>2</sup>. In developing countries, the aim is essentially to steadily reduce the use of cash and to connect a significant proportion of the population into basic financial services.

<sup>2</sup> Money and Payments: The U.S. Dollar in the Age of Digital Transformation (federalreserve.gov)

Changing views of different age groups on the usefulness of banking apps/websites since the COVID-19 pandemic



Note: Question: Since the COVID-19 outbreak have your views on the usefulness of banking apps/websites changed? Proportion of people using banking apps/websites in the last 12 years, based on 944 respondents.

Source: Kearney: Want to maintain digital focus post-pandemic? Banks should make these four moves (2020 COVID-19 banking and payments survey).

#### Chart 6 Typical functionality of a financial application for youngsters



More and more FinTechs have recognised the potential of digital financial inclusion. The high smartphone and internet coverage in most countries makes it easier to reach consumers through apps, including even their inclusion in digital finances. Nowadays, many FinTech applications focus on areas that are often neglected by the banking system (e.g. youth and family finance, easy and smaller savings and investment solutions, increasing the use of financial services by women). These FinTech services build specifically on the fact that digitalisation can improve not only the quality of financial services, but also their accessibility and cost-effectiveness, helping, among others, to attract the unbanked.

To ensure the long-term uptake of digital financial solutions, it is worth starting financial education among school-age children using gamification. Young adults are currently the biggest and most frequent users of financial mobile apps. A survey also shows that following the COVID-19 situation, younger age groups are more positive about the usefulness of banks' digital channels (Chart 5). This is why it is worth raising the interest of the still unbanked 8–16 age group in mobile banking services, so that they can become active users of innovative solutions as young adults, forming an even larger base. More and more banks and FinTechs are providing financial apps for students or families to learn and play with as well as to learn about simple financial transactions. The young are receptive to learning the knowledge embedded in social games, while they can learn how to use an account, manage everyday transactions or even contact customer service. Apps have a wide range of functionality (Chart 6) and are becoming increasingly popular around the world. In the 2020–2021 school year, the MNB also launched its Digital Student Safe, a financial literacy app for students and parents, which is currently being further developed and its functionalities are expanded.



Note: The survey was conducted between February and March 2019 among a total of 27,103 digitally active adults in 28 countries. The percentage differences shown in the figure represent how likely it is for women to have less access than men on each issue.

Source: Financial Alliance for Women (2021): Gender-intelligent FinTech design: how FinTechs can capture the female economy, October 2021.



Note: In the proportion of respondents, based on 1178 respondents. The question on the systematic measurement of sustainability metrics received 1032 responses.

Source: McKinsey (2021): 2021 global report: The state of newbusiness building. The development of women's financial literacy and empowerment are no longer just on the agenda of large corporations and organisations; there are now countless FinTech companies focusing specifically on women's financial access and supply. Women are less likely than men to use financial services from traditional financial institutions (having bank accounts, managing family finances and investments), and there is a significant difference in the use of FinTech solutions, according to a BIS (Bank for International Settlements) analysis of data from 28 countries<sup>3</sup> (Chart 7). A more active participation of women in financial operations would be socio-economically beneficial, but it would also improve the return on investment figures of service providers by serving a growing customer base. The FinTech companies that deal with women's financial inclusion focus on women's digital and financial education, creating crowdfunding platforms, connecting female small business owners, financing women's health, or even promoting blockchain-based digital assets.

Thinking responsibly about the future means that sustainability is an increasingly important issue for customers, and therefore also for FinTech service providers. Given that FinTech startups are fundamentally flexible and open to innovation, they have also been able to better track the evolution of customers' sustainability needs (Chart 8). Related to this, customers today are increasingly looking at how their service providers address ESG (environmental sustainability, social issues and responsible corporate governance) aspects not only in their lifestyles, but also in their investments. This trend is even stronger for the millennial generation, who will decide on a huge share of bank profits in a few years' time by making a conscious choice of bank (presumably just the more conscious young people who have savings). In addition to being useful and educational, services and products that include ESG elements can also be used to increase customer interactions because of their popularity. Such products could include for example an app that provides estimates of the customer's carbon footprint based on their spending, a credit card that rewards eco-conscious purchases, green investment opportunities, or even micro-investment opportunities for a wider-than-before range of customers based on the social aspect. To categorise FinTechs or services for sustainability purposes, a Swiss initiative has developed a taxonomy of FinTech solutions for green purposes, in line with the categories used by the BIS (Bank of International Settlements), the FSB (Financial Stability Board) and the WEF (World Economic Forum) (Chart 9), which helps to

<sup>&</sup>lt;sup>3</sup> The FinTech gender gap (bis.org)



Source: Green Digital Finance Alliance, Swiss Green Fintech Network (2021): Interim Report: A Green Fintech Taxonomy and Data Landscaping.

#### Chart 10





Source: CCAF (2021): The 2nd Global Alternative Finance Market Benchmarking Report.



Note: The top 10 blockchain platform transactions are included in the data set. Blockchains other than these, or intra-platform transactions that do not appear on other blockchains were not considered. Source: Dappradar (2021). provide an overview of market solutions and to orient potential new entrants.

In times of uncertainty, such as an economic slowdown caused by the pandemic, innovative FinTech investment and financing solutions will also play a greater role. In the last few years, a number of innovative online investment platforms have emerged which, with their modern and easy-to-understand interface and guick and simple usability, have made both traditional investment products (e.g. shares, mutual funds) and new forms of investment (e.g. cryptoassets) accessible to a wide population. With the development of digital technologies, such as blockchain, these platforms are able to serve their customers in an increasingly extended timeframe, often with 24/7 global availability, at lower and lower cost and with greater efficiency. But alternative online financing markets also carry significant risks. The tightening of the Chinese regulations in this area has also led to a fall in global volumes. Apart from China, the market for alternative online finance has grown steadily in recent years (Chart 10).

NFT was one of the hot digital assets in the investment markets in 2021. It is estimated that the trading volume reached 25 billion dollars last year, compared to less than 100 million dollars in 2020 (Chart 11). In many cases, there may be real value-added use cases behind the growing interest (see Box 1), which is why the MNB is also actively testing blockchain technology.

To meet the digital needs of consumers, financial service providers continued to build ecosystems in 2021, typically involving FinTech companies. Beyond a certain level of efficiency, the competition of financial institutions can only be enhanced by building and consciously managing platforms and ecosystems beyond banking, or basic financial services. By offering a wider range of services, customers can be encouraged to be active on a daily basis, and thus to stay loyal and pay additional fees. This trend is no longer limited to banks and Big Techs; FinTech companies that have been focused on one specific service are gradually building their ecosystem, launching a wider range of financial, insurance or social functions.

It is difficult to say today what the long-term impact of the current popularity of NFTs will be, but it is clear that blockchain technology can provide value in a number of business models. The advantage of NFTs is that they provide transparent and traceable digital ownership, which could be widely used in the future to prove ownership of physical assets. In addition, the programmability of NFTs through smart contracts could provide further valuable application opportunities.

#### Box 1

#### The worldwide rise in the popularity of NFT

An NFT (non-fungible token) is a digital asset that embodies the ownership of a digital content, using blockchain technology. Each NFT has a unique serial number that uniquely identifies it, hence the name: non-fungible token. The transactions associated with each NFT are stored in a blockchain, which also allows the ownership history of a given NFT to be traced transparently. Several types of NFTs are known, differing mainly in their field of usage, although in many cases there are overlaps among them. These can be categorised as art, collectible and utility NFTs.

**Digital art is one of the best-known uses of NFTs.** Creators can create an artistic NFT from a work of art in the physical world (e.g. a painting) or even a digital work of art (e.g. an image drawn in paint), allowing unique identifiers to authenticate the origin of the NFT in the digital space. The growing interest in digital art is shown by the fact that several works of art were sold for tens of millions of dollars in 2021.

The development of interest in NFT on a global scale has been driven by the growing popularity of collectible NFTs. These NFTs are similar to numbered basketball cards, there are multiple specimens of them that look the same, but they can still be distinguished by their unique serial number and can represent a unique value for who owns which one. They may also be issued as a series of NFTs, in which each element of the series has a percentage chance of having certain traits; the rarer the trait the more valuable the NFT.

A breakthrough for NFTs towards traditional market players can be reached by utility NFTs. The essence of this type is that it provides the owner with certain functions in the digital or real world. This feature can be valuable in many industries. The holder of an NFT issued by a musician may be entitled to a priority concert ticket purchase or a personal meeting after the concert. But in the same way, the seller of a product can offer a purchase discount to the holders of NFTs issued by him.

Like crypto assets, the intrinsic value of NFTs is difficult to determine, and speculation plays a significant role in the evolution of market prices. Market prices are currently driven by strong demand pressure, which may even have a self-reinforcing effect. Regardless of this, it is worth identifying the characteristics that can help in the assessment of NFTs. In the case of artistic NFTs, as with traditional works of art, the professional recognition and popularity of the creator can be a guiding factor. For a collectible NFT, the most important factors are its serial number, rarity and trading intensity. For utility NFTs, the function they offer and their expected future value can determine the market price. It is also important to note that the production of NFTs on public platforms requires little technical knowledge and has therefore become a popular tool for fraudsters.

It is difficult to say today what the long-term impact of the current popularity of NFTs will be, but it is clear that blockchain technology can provide value in a number of business models. The advantage of NFTs is that they provide transparent and traceable digital ownership, which could be widely used in the future to prove ownership of physical assets. In addition, the programmability of NFTs through smart contracts could provide further valuable application opportunities.



Chart 13 Median FinTech investment over time by maturity stage of firms



Chart 14 Evolution of the number of FinTech Unicorns



## **1.3 FINANCING OF FINTECH FIRMS**

Despite the slowdown in the early days of the prolonged pandemic caused by COVID-19, the second year of the pandemic saw unprecedented records in the FinTech market in terms of funding. In 2021, market participants were already over the first initial uncertainty about the economic outlook, and regulatory restrictions were mostly less severe than a year earlier. Thus, not only the new digital and financial habits that emerged in 2020, but also the types of services that were scaling up already before 2020 have all generated demand for the sector. Examples for the new type of interest include the increased retail demand for securities markets due to the temporary suspension of sports betting, and the unprecedented attention to blockchain and cryptoassets. The most significant case in the latter type of services was the resurgence of cross-border travel and the resulting foreign exchange transactions.

After a slowdown in early 2020, the amount of capital flowing into the global FinTech sector surged in the first half of last year. The total value of investments in 2021 was already more than a third higher in the first three guarters than in the whole of 2020. And the year 2021 as a whole, apart from a record year in 2019, surpassed all previous years in terms of aggregate value (Chart 12). There was a significant increase in the number of transactions, which gives a dual picture of the sector. On the one hand, the sector has become more and more mature over the years. Even before the pandemic, the size of the markets and the number of customers acquired by the players established in the 2010s was already in the order of millions, so that even in the new waves of the pandemic, they enjoyed a profound investor confidence (Chart 13). On the other hand, the growth in the global volume of FinTech investments has been catalysed by the development of regions that are currently lagging behind. Here, the early-stage investments were dominating. This process may accelerate significantly in the coming years due to the growing importance of financial inclusion and the further democratisation of technology, i.e. its accessibility to an ever wider range of people.

In 2021, we could see an unprecedented jump in the number of FinTech unicorns. Last year, more than ever before, was dominated by unicorns, companies worth more than a billion dollars. Globally, one in four companies that also qualify as a unicorn come from the FinTech sector. More than one hundred and fifty new FinTech unicorns were born in 2021 alone, bringing the global total to over two hundred and thirty (Chart 14). The reason for this outstanding growth is that FinTech companies founded in the last decade are becoming more scalable as their



initial transformational impact grows, which is increasingly valuable for investors. Geographically, the US still has the largest number of FinTech unicorns, but Asia and Europe are catching up. A closely related phenomenon is the dramatic increase in the total number of so-called large investments<sup>4</sup>, with the five largest fundraising circles each raising more than five hundred million dollars.

The Americas remained the preferred target market for FinTech investors in 2021, but the EMEA region is catching up in terms of investment volume. In the US, an unprecedented level of venture capital and private equity investment has pushed the total value of capital raised by the continent's FinTech sector by more than a guarter of its 2020 level, but down just ten per cent from the record high in 2019, before the pandemic. In the Americas, venture capital investments, the main driver of growth, showed an outstanding value compared to global deals as well: In 2021, regarding all transactions, one in three was in this category, and they were not far behind in value (Chart 15). This is due to the proactive approach of the US entrepreneurial and investor culture, and the region's openness to new solutions and innovative financial products, even at the earliest startup stages. In the EMEA region, in addition to venture capital investments, private equity and M&A financing activity has increased dramatically since the pandemic broke out. One of the drivers of the region's growth was the African continent, which had a record year in 2021. The drivers of the very significant growth in Africa are the proliferation of smartphones and the low penetration of financial services, which will enable further dramatic growth in the FinTech ecosystem. This development is particularly expected in the payment services, InsurTech and WealthTech segments. The Asia-Pacific (APAC) region also saw growth during 2021. The development of the region's ecosystem is demonstrated by the fact that the number of the transactions surpassed previous records and the total value of investments almost doubled the 2020 value—but still fell short of the absolute record set in 2018. The solutions called BNPL (Buy Now Pay Later, see Box 2 for more details), which are very popular in the region, have received outstanding investor attention. Among these, the very significant acquisitions of the Australian Afterpay and the Japanese Paidy are particularly noteworthy. However, the tightening Chinese regulations have led to significant devaluations and regional reallocations in the activities and stock exchange listing of the technology sector. What are called embedded finance/banking and BaaS (Banking-asa-Service) models can also be identified as a new trend in the region.

<sup>&</sup>lt;sup>4</sup> Large investments are so-called megadeals, which are capital investments of at least 100 million dollars each.



**FinTech companies that provide payment services and account products continue to gain popularity among investors and consumers.** The pandemic has made digitalisation and remote access part of everyday life more than ever before, and thus the focus of investors has been on emerging and returning consumer habits. It is becoming increasingly clear that the product focus that characterised financial services before the outbreak of the coronavirus pandemic is being replaced by solutions that are more customer-centric than ever before. One of the most significant examples of this is the explosion of BNPL solutions, which can be identified as one of the most prominent global trends for 2021.

The big advance in 2021 was in investments related to blockchain technology, but cyber-defence is also attracting increasing attention. The explosion in the value of capital flowing into blockchain and cryptoasset firms now accounted for more than a quarter of the sector and the trend is expected to continue as the crypto ecosystem expands, particularly in the US, Canada and the Caribbean.

There was also a dramatic increase in demand from investors for innovative players in cyber defence and wealth management (WealthTech). These were driven mainly by a dramatic increase in cyber-attacks and ransomware, reflecting the surge in digital transactions, but also by the growing presence of KYC and fraud management solutions providers, which could be further strengthened by the rise of open banking. However, the WealthTech market is also on the rise, thanks in no small part to the fact that a significant proportion of the younger generation is now conducting their investment transactions exclusively digitally. As a result, in addition to the many startups that have emerged, the market has already seen acquisitions by the largest incumbents.

Overall, the InsurTech and RegTech sectors were marginally down on the results of two years ago, but the increase in the number of transactions shows investor interest. In 2021, insurance providers have typically focused on strategies in new directions to be developed along embedded financial services. These mainly took the form of partnerships and additional investments, made even by large companies (Chart 16).

#### Box 2 BUY NOW PAY LATER

a 21st century competitor to classic credit card, commodity credit and cash loan products

In recent years, "Buy Now Pay Later" (BNPL) deferred payment solutions have gained huge popularity in many countries around the world. In the UK, for example, the volume of transactions through the BNPL service quadrupled in 2020, while 56 per cent of consumers in the US already used BNPL in 2020. Recently, we have heard of numerous largescale acquisitions and capital raisings involving BNPL providers (e.g. Klarna, Square - Afterpay, Paypal - Paidy), and the largest players in the payments market are announcing that they are expanding their service portfolio with BNPL solutions (e.g. Revolut, Apple - Goldman Sachs, Mastercard, Monzo and Curve). The segment has attracted not only the most investor attention in most continents, but also the largest number of customers, thanks mainly to increased demand for e-commerce and short term, easy and convenient, fully digital financing features.

The activities of BNPL providers pose a challenge for banks, as their service is an innovative competitor to their traditional credit card, commodity credit and cash loan products. The BNPL service is essentially an innovative payment method where registered consumers can pay for their purchases in several equal instalments, free of interest, over a period of time. Meanwhile, the full amount is paid to the trader by the BNPL service provider and the instalments are collected from the consumer (Chart 17). Increasingly,

#### Chart 17 Operating model of the BNPL service



the logos of BNPL providers appear alongside the icons of the card companies among the physical and online payment solutions accepted by more and more shops. The payment market participants are fighting hard to get the consumers to choose their solution. The banks have realised that they need to rethink their traditional products, for example in Australia several banks have abolished the annual fee for their credit card products to compete with free BNPL services and several banks have started to offer BNPL-like solutions as part of their credit card services. With more payment options, consumers can choose from cheaper offers, typically with a more transparent fee structure, so the pricing of banking products should also be simplified.

The popularity of BNPL services can be explained by several current trends. On the one hand, young people are sceptical about traditional banking products, especially credit products, but are open to modern, innovative solutions accessible via their mobile phone. On the other hand, welfare societies can in some cases be characterised by excessive and often financially irresponsible spending, with many consumers preferring to buy the products they want immediately. Thirdly, these providers offer an additional online presence (webshop) and an offline payment method to merchants seeking to an omni-channel reach of their customers.

The BNPL services can encourage more prone consumers to make impulsive, ill-considered purchases, which increases the risk of non-payment and, together with the consumer's overall credit obligations, the risk of overindebtedness. BNPL-type credit facilities require special considerations from a consumer protection and prudential perspective. The fact that BNPL providers operate within the EU on the basis of a credit provision licence is not a sufficient guarantee of consumer protection (e.g. the consumer protection provisions of the EU directive on consumer credit agreements do not apply to EU BNPL providers). Given that these service providers do not voluntarily subject themselves to consumer protection requirements, a number of problems may arise despite their regulated activities: for example, the obligations to assess the consumer's creditworthiness, advertising and pre-contractual information obligations do not apply. The regulatory framework for the BNPL service varies from country to country, but typically they are not subject to the obligation to provide data for any credit reference agencies due to their lower exposures (below HUF 300,000 in Hungary). The bank is not informed of BNPL obligations during a credit scoring, and BNPL providers do not take into account the consumer's new bank credit for further purchases, so the consumer's total repayments may rise beyond his or her ability to pay. The over-indebtedness of consumers can increase the proportion of non-performing loans, which can lead to financial stability risks.

#### Chart 18

Which channels costumers would use to access certain banking services in a post-COVID world



Note: Respondents could choose more than one category for a given service, or choose none of the options. Accordingly, the proportions of the responses to a poll can vary from 100 percent to both positive and negative.

Source: Deloitte (2021): Building on the digital banking momentum.

## 1.4 LANDSCAPE ON BANKING DIGITALISATION AND BANK-FINTECH COOPERATION

There is a sustained customer demand and expectation for convenient, digital banking services. Despite the severe restrictions experienced during the first waves of the COVID-19 pandemic, the banking system has continued to function smoothly, thanks in part to the rapid digital transformation of customer service seen in 2020. Through these processes, the generally positive image of banks that has existed for years as trustworthy institutions was maintained for 2021. However, the surge in digital banking activity during the pandemic has also become a lasting expectation. The shift of banking services into the digital space has focused attention on a number of convenience services, while the vast majority of customers have become digitally mature and active users of certain online banking platforms, and as a result, increased online activity in many areas is likely to be sustained. Users' preferences reflect the fact that for less complex processes (e.g. credit transfer, settling invoices, modifying data), the remote, digital form may continue to be preferred. However, non-routine issues requiring discretion such as opening an account, financial planning or investment advice, a personal presence may remain important, but digital needs and expectations are likely to grow also in these areas (Chart 18).



Chart 20 Main areas targeted by banks to reduce operating costs



Note: Percentage distribution of respondents ranking each area, an institution could choose more than one response. Source: EBA (2021): Risk Assessment Report. The overall image of banks is increasingly defined by the availability and convenience of digital solutions. In general, the image of banks is effected by a number of factors, including the range of products and services available, reputation and branding, coverage area, market positioning, but digitalisation aspects are also more and more valued. Convenient digital availability is increasingly important for customers, especially young adults particularly tend to change their underperforming bank for another (Chart 19). At the same time, institutions should pay attention to young age groups, given that today's young customers new entrants to financial services—will form the backbone of the customer base of the future.

An important and partly forward-looking task is to match each space where the services are used with the specific needs for all age groups. When developing digital interfaces for banks, specific customer preferences and needs are in priority, even within different age groups. Given that for some age groups and customer segments, both face-to-face and remote customer service may remain relevant in the long term, a multi-channel approach is needed for using personalised banking services, ensuring interoperability between channels. However, an important aspect of such phygital access to the services and the creation of a long-term sustainable business model is the internal modernisation of institutions, and thus the implementation of a comprehensive digital transformation.

**Conscious, comprehensive digital planning is increasingly being applied to all areas of banking operations.** Institutions are prioritising digital transformation not only in their external relations, but also for their back-office processes. The banks, recognising the opportunities, are also looking to digitalisation as a primary solution to achieve their optimisation and cost reduction plans, as reflected in the European Banking Authority (EBA) survey (Chart 20).



Note: The survey is based on questions asked of executives at a total of 290 US-based banks and credit unions.

Source: Cornerstone Advisors (2022): The State of The Union in Bank-FinTech Partnerships.

#### Chart 22 Average number of new incumbent-FinTech partnerships per year



Note: The survey is based on questions asked of executives at a total of 290 US-based banks and credit unions.

Source: Cornerstone Advisors (2022): The State of The Union in Bank-FinTech Partnerships.

#### Chart 23

Percentage of respondent institutions who faced challenges adopting certain technologies



The openness to bank–FinTech partnerships has also continued to grow, although there is still room for improvement in terms of effective partnerships. Some of the banking players already recognised the potential benefits of FinTech collaborations for certain developments before the coronavirus outbreak, but COVID-19 and the need to rapidly adopt digital solutions has led to further collaborations (Chart 21). This shift is reflected in the development of partnerships in recent years, but despite this, the number of FinTech–incumbent collaborations is still not high: In 2021, the US banks partnered with an average of 2.5 new FinTech companies (Chart 22). The possible partnership forms are also expanding with the spread of embedded and platform-based financial service-selling models (e.g. Banking-as-a-Service, Open banking).

Nowadays, several transformational developments are taking place in parallel at the same institution, but the banks face a number of significant obstacles. The vast majority of institutions also face barriers to implementing advanced and innovative technology solutions, whether they are developing them on their own or in collaboration with FinTechs. Solutions based on artificial intelligence stand out in this area, as they are the most promising development and have been launched in the largest number of banks; partly due to their complexity, the most obstacles occur in their implementation (Chart 23). These obstacles tend to be multifaceted and take the form of both physical constraints (e.g. lack of scalable underlying infrastructure) and more general, conceptual problems (e.g. outdated implementation mechanisms), while the need to attract the right expertise for implementation and subsequent operation also appears to be an increasing problem.



Source: Gartner (2022): IT Key Metrics Data 2022: Industry Measures — Banking and Financial Services Analysis.





Source: Gartner (2022): IT Key Metrics Data 2022: Industry Measures — Banking and Financial Services Analysis.



Source: APWG (2022): Phishing Activity Trends Report, 4th Quarter 2021.

There were diverse developments regarding the IT resource needs of banks. Although the year 2020 brought a less spectacular jump in the growth trend of IT spending compared to preliminary expectations, the higher cost ratio was maintained in 2021 as well (Chart 24). This is probably because for the majority of institutions, the COVID period has typically revealed a number of additional, even longer lead-time, development and modernisation needs, often concerning the basic infrastructure. Meanwhile, following a peak in 2020, by 2021 the overall headcount increased more than the banking IT costs, meaning that the IT support of employees declined. However, the relative increase in IT working hours has also slowed compared to the trend in previous years (Chart 25).

## 1.5 CYBERSECURITY CHALLENGES DURING THE PANDEMIC PERIOD

Ongoing cyber threats are becoming inherent part of the banking sector's operation. The proliferation of digital channels for financial services, accelerated by the COVID-19 pandemic, has significantly increased the exposure of banks to cyber-attacks, which the increasingly sophisticated malicious actors have sought to exploit. The ongoing and growing cyber threat often aims at the customers. Typically, in the form of increasingly credible and authentic-looking phishing, payment-related transactions, credit card or SIM card frauds, but increasingly also in the form of investment frauds or malicious attacks on mobile phones. The number of phishing attacks reported in a given month tripled between the beginning of 2020 and the end of 2021<sup>5</sup>, and the targets are most often the members of the financial sector or their customers (Chart 26). However, the institutions are not spared by the attackers either. In their cases, DDoS attacks, ransomware attacks involving GDPR fines used as added leverage as well as the possibility of BEC or CEO attacks targeting employees, can increasingly be expected<sup>6</sup>.

<sup>5</sup> <u>APWG | Phishing Activity Trends Reports</u>

<sup>6</sup> Internet Organised Crime Threat Assessment (IOCTA) 2021 | Europol (europa.eu)



Innovative technological developments that go hand in hand with a growing online presence can also be exposed to cyber risks. The shift from traditional infrastructures to online and cloud-based solutions, which is increasingly observed in banking sectors, and the wider adoption of innovative technologies such as IoT and artificial intelligence, mean that cybersecurity threats are generally on the rise. To prevent attacks on cloud usage, the 3 largest cloud service providers made significant investments in cyber and data security over the past year<sup>7</sup>. The use of new technologies and changing work schedules also provide plenty of opportunities for cybercriminals to be creative, with only 20 per cent of attacks before the pandemic being of new types, but this figure rising to 35 per cent during the pandemic<sup>8</sup>. The threats to supply chains and their potentially catastrophic cascading effects have reached the highest rank among the main threats.

The sale of Malware-as-a-Service is a new form of cybercrime and a growing trend worldwide. A particular risk in this area is that most virus software is relatively easy to buy, so the technical barrier to entry for cybercriminals is greatly reduced. The examples include ransomware, denial of service, phishing and misinformation services, where a criminal can successfully attack individuals or even institutions without high technical skills. 2 out of 3 ransomware attacks are committed by Ransomware-as-a-Service<sup>9</sup>.

The number of ransomware attack attempts has more than tripled in the last two years, with nearly 20 ransomware attacks happening every second today (Chart 27). In 2020, November was the worst month, with 37.8 million attack attempts, but in 2021, a new record was already set in January with 43.1 million monthly attempts. Due to the rise of ransomware-as-a-service and successful attacks on an increasing number of targets, the monthly figure nearly doubled by June 2021. Multiple factors could be behind the sudden surge in ransomware attacks. On the one hand, the exponential growth of the international cloud structure is increasing capacity. On the other hand, the constantly evolving and increasingly sophisticated techniques, multi-layer attacks and the growing number of dark web organisations that create them, which supply ransomware services to criminals.

8 <u>https://www.youtube.com/watch?v=R8qft-5zA6g&t=6504s</u>

<sup>&</sup>lt;sup>7</sup> <u>https://www.cnbc.com/2022/03/29/google-microsoft-ramp-up-cloud-security-as-cyberattacks-increase.html</u>

<sup>&</sup>lt;sup>9</sup> https://www.zdnet.com/article/ransomware-as-a-service-is-the-new-big-problem-for-business/



Source: BIS (2021): Big techs in finance: regulatory approaches and policy options.

## 1.6 REGULATION OF THE FINTECH SECTOR, ITS DEVELOPMENT AND REGULATORY INITIATIVES

In 2021, the focus of international regulatory efforts regarding digitalisation was on addressing FinTech and Big Tech business models, which already require regulatory action globally. Recognising the increasing urgency of the need for regulation, some of the issues to be addressed were identified and some concrete proposals were made.

The penetration of technology firms in financial markets calls for increasingly urgent regulatory action, where a combination of an activity and entity-based regulatory model may be most effective. The Big Techs are expanding very rapidly in various industries, including the financial sector, especially in emerging markets, by leveraging their competitive advantage, the data assets they have at their disposal due to their other activities, and network effects. At the same time, the current financial regulatory framework is difficult to apply to them, especially also in the knowledge that business models are constantly changing and evolving with the help of the data assets and the analysis of those customer data, while services are provided across borders by huge groups active in several industries (Chart 28). The regulatory response to deal with financial services provided as a non-exclusive activity may be based on a hybrid, i.e. a mix of the activity and the entity-based models: the home Member State's entity-based approach may be able to cover the cross-border, group-level activities of tech firms, while the supervisory authorities of the host countries may be able to address risks in the host state through activitybased regulation. Although technology companies do not yet threaten the incumbents' positions, the situation can change rapidly and they can become systemically important players in the financial sector, so the regulatory authorities need to be prepared in time and address the risks arising from, among other things, innovative business models, presence in different industries and cross-border activities.

The prudential regulatory authorities should work with data protection and competition regulators as soon as possible to develop appropriate responses. Developing cross-sector and cross-border cooperation is key to the development of a financial regulatory framework for tech firms. The cornerstone of the success of the future financial regulatory framework is a holistic approach to the regulatory and supervisory challenges posed by the emergence of Big Techs in financial markets. Particular attention should also be paid to the issue of personal data which is usually the basis of the operating model in digital markets. Currently, regarding the benefits of tech firms, some regulatory anomalies also arise: although traditional



Note: Based on a representative sample of 1,361 US households, September 2020.

Source: BIS (2021): Regulating big techs in finance.

Chart 29

market players work with significantly less data than tech firms, it is still the banks that have to share some data with tech firms in the EU due to the PSD2 regulation. But data sharing doesn't work the other way around, as the GDPR strictly forbids tech companies to share their data with the banks.

With the development of digital solutions and the proliferation of super-apps, the efficient and ethical use of data is becoming increasingly important. One of the characteristics of the digital economy is that it is datadriven, so data has significant economic value. The main deception of this economy is that it is free. In practice, the free services provided by platform providers have a subscription fee, which is paid by the users when they provide their personal data. In the European Union, a series of strategic and legislative initiatives that affect data began appearing. The draft Data Governance Regulation, published in 2020, would provide the legal framework to allow people to trade their data, for example Big Tech companies to pay data providers directly for their data. A growing number of professional forums are raising the possibility of users receiving a remuneration for their data under the terms and conditions they set, but in practice there is no widely accepted regulatory solution yet.

There is a general crisis of confidence regarding the use of data (Chart 29). The solution to this problem can be a new technology called Self-Sovereign Identity (SSI), which means that consumers directly manage their data and can decide with whom they share information. The use of this technology is also a growing trend in the financial sector. It has become clear by now that there is a significant competitive advantage to be gained by strengthening the trust of users (Chart 29).

Some major regulatory authorities have already taken concrete actions against the so called "walled garden" model of the tech giant platforms restricting or eliminating competition. Regulatory action on digital markets dominated by tech giants is a long-awaited and welcomed initiative everywhere, but different geopolitical regions have applied slightly different approaches (Table 1). The European Union has published a draft regulation, directly applicable in all Member States, to regulate the activities of the Big Tech companies and protect competition in the market. The so-called draft legislation on digital markets is an ex-ante market regulation proposal that aims to protect both forms of market competition, competition in the market and competition for the market. In the United States of America, in the form of several related bills, the regulation of large digital platforms is also in progress. In the UK, the broad consultation on the regulatory framework to

Table 1           Approaches to data protection and data sharing requirements in each global region						
Subject area		Requirements in regulations		European Union	The United States	China
Data protection	Collection and use of personal data	How extensive is the current legislation		Comprehensive	Partial	Comprehensive
		Which aspects are covered by the existing legislation	Legality, fairness, transparency	Yes	Yes	Yes
			Goals	Yes	Under negotiation	Yes
			Safety	Yes	Yes	Yes
	Costumer's rights in relation to the data processed	How extensive is the current legislation		Comprehensive	Partial	Partial
		Which aspects are covered by the existing legislation	Consent, access	Yes	Under negotiation	Yes
			Correction, deletion	Yes	Under negotiation	Yes
			Portability	Yes	Under negotiation	Yes
Data sharing	Open banking	How extensive is the current legislation		Partial	Early stages	Early stages
		The regulatory approach (prescriptive, facilitative, market- driven)		Prescriptive	Market	Market

Note: \* Under the facilitative approach, jurisdictions issue guidelines and recommended standards, and release open API standards and technical specifications. Under the market-driven approach, there are no explicit rules or guidance that either require banks or prohibit them to share customer-permissioned data with third parties.

Source: BIS (2021): Big tech regulation: what is going on?

support competition in the market was closed in October 2021, so although a concrete legislative proposal is still pending, the so-called <u>Digital Markets Unit</u> was set up within the UK Competition Authority in spring 2021 to prepare for the new regime.

In addition to the known challenges, the continuous evolution of digital markets requires new regulatory responses. With the surge in online purchases triggered by the COVID-19 pandemic, the newly emerged Buy Now Pay Later (BNPL) financial service providers have gained huge popularity in a short period of time (see Box 2 for more details). As it is a type of credit facility, international regulation is uniform in that it makes the innovative service conditional on the existence of some form of credit provision licence. However, there are differences between countries in terms of specific requirements (Table 2), which also has a significant impact on the expansion of this type of service. As a result of the more flexible approach of the United States, this solution is the most widespread and has the largest market uptake there. Within Europe, this service is popular in the UK, but the European Union's strict requirements mean that BNPL's popularity and take-up is not yet as pronounced in the EU as elsewhere.

Table 2
Types of licence for BNPL providers in each
jurisdiction

Jurisdiction	Type of authorisation
EU	Credit institution license
UK	Consumer credit authorisation
USA	Licence or entitlement to grant credit in a given state

Source: MNB.

## Chart 30

# EU FinTech regulatory milestones and initiatives in 2021

1 <sup>st</sup> Quarter of 2021	<ul> <li>White Paper on Open Insurance (EIOPA)</li> <li>Request for proposals fotm the Euripean system of financial supervision about digital finance related topics (European Commission)</li> <li>Consultation on an EU wide instant payments system (European Commission)</li> </ul>
2 <sup>nd</sup> Quarter of 2021	<ul> <li>Cross cutting draft legislation on Artificial Intelligence (European Commission)</li> <li>White Paper on the potential of blockchain and smart contracts in the insurance market (EIOPA)</li> <li>Call for information on the use of digital financial solutions (ESMA)</li> <li>Report on governance and control principles for artificial intelligence (EIOPA)</li> </ul>
3 <sup>rd</sup> Quarter of 2021	<ul> <li>Legislative plans for an EU anti money laundering regime (European Commission)</li> <li>Report on FinTech solutions used by CSDs (ESMA)</li> </ul>
	<ul> <li>Report on the use of digital platforms in the EU banking and payments sectors (EBA)</li> </ul>
4 <sup>th</sup> Quarter of 2021	<ul> <li>EU Community funding regulation entry into force (European Parliament)</li> <li>Establishment of a euro area framework for electronic payments supervision (ECB)</li> <li>Report on threats and fraud trends 2021 (European Payments Council)</li> <li>Developing an EU wide Cross Border Regulatory Sandbox Testing Framework (EBA)</li> </ul>
Source: MNB.	

In 2021, the European Union continued with vigour the coherent regulatory modernisation process started in previous years. The market for FinTech innovations in banking and insurance saw new regulatory and supervisory initiatives (Chart 30) over the past year, which already demonstrate the European Union's commitment to regulatory innovation. In parallel with the emerging initiatives and plans, the consultation on the legislative proposals published in the Digital Finance Package in September 2020 continued, with the main focus on the EU regulatory plans for cryptoassets (MiCA) and the draft regulation on digital operational resilience for the financial sector (DORA).

To maintain the competitiveness of the European Union, the European Commission has committed itself to the development and use of artificial intelligence technology. In April 2021, the Commission published the world's first regulatory proposal on artificial intelligence. The <u>draft</u> regulation on artificial intelligence lays the foundations for the use of "trusted" AI in a risk-based approach and, if adopted, binding rules would govern and be directly applicable in all Member States to promote the uptake of AI, investment and innovation.

The fight against money laundering and terrorist financing could reach a whole new level thanks to the European Commission's new package of proposals. For many years, the EU's fight against money laundering and terrorist financing has been structured around directives that the Member States have to transpose into their national legislation. Instead of the often fragmented national regulatory system, according to the directive form, the Commission's proposal, published in July 2021, would strengthen uniform application by raising certain requirements to the level of a regulation. As part of a very wide-ranging set of proposals, the anti-money-laundering supervision of some financial service providers would be brought under the new EU anti-money laundering authority within an integrated supervisory framework. The package would also further strengthen the anti-money-laundering supervision of cryptoasset providers by placing all providers under the supervision of the common authority, removing the possibility of using anonymous crypto wallets and requiring all providers offering cryptoasset trading facilities to conduct customer due diligence.

Table 3 Operation of the EFIF's procedural framework for cross-border testing						
	1st case	2nd case	3rd case			
Name	Cross-border testing	Testing with observers	Testing with ex-post data sharing			
Description Testing an innovative solution in several (at least 2) European countries, so that it meets the regulatory sandbox criteria in each target country individually		Testing an innovative solution locally, but for some regulators the whole process can be traceable	Testing an innovative solution locally, but with some regulators the test results are shared ex-post			
Number of regulators actively involved in testing	at least 2	1	1			
Role of other regulators involved in specific testing Active participation in testing, Observer role		Observer role: insight into the entire testing process and documentation	Receiving the results and assessment following the testing			
Source: MNB edits.	·	· · · · · · · · · · · · · · · · · · ·				

The European Forum for Innovation Facilitators (EFIF) has developed a procedural framework<sup>10</sup> for crossborder testing to support the spread of FinTech solutions across the European Union in a regulated framework. The framework does not wish to turn the innovation hubs and regulatory sandboxes in the Member States into a pan-European system, but aims at a structured sharing of information on testing across borders. Based on the Procedural Framework published in December 2021, information related to the testing of a FinTech solution can be communicated to different supervisory authorities in the single market in three different ways (Table 3). The FinTech companies will be able to apply to this EU testing framework—in addition to applying to the regulatory sandbox in their Member State(s)—through the EU Digital Finance Platform, a one-stop contact point run by the European Commission. The EFIF will be responsible for the structured sharing of information between national supervisory authorities and for facilitating the development of a common position on the uptake of innovative technologies.

From 10 November 2021, the <u>regulation on crowdfunding</u> <u>service providers for businesses</u> become mandatorily, directly applicable in all EU Member States, and is expected to significantly expand the EU's alternative finance market. For years, many Member States—such as Austria, Lithuania, Spain, Italy and France—have sought to exploit the potential of crowdfunding through national legislation, which has necessarily limited the crowdfunding investment/lending to the national market. However, under the new rules, a service provider with a licence to provide crowdfunding services for businesses in one Member State

<sup>10</sup> Procedural Framework for Innovation Facilitator Cross-border Testing

can operate throughout the EU. For service providers, this means cost and time savings and for investors and project promoters means the widening of choices and, presumably, greater confidence in this form of financing. A gradual and significant growth of the crowdfunding market can therefore be expected over the coming period, taking into account both the length and smoothness of the authorisation procedures for new entrants, in particular in Member States without national regulation, and the transitional rule of the regulation, according to which providers already authorised to provide crowdfunding services under national law at the date of entry into force of the regulation will only need to obtain an EU authorisation by 10 November 2022 at the latest.

#### Box 3

#### Central bank digital currency – a new evolutionary step for money

With the widespread advance of digitalisation, the question that is increasingly arising at central banks is what is the form that the digitalisation of money will take, the market structures that will emerge as innovative service providers proliferate, and ultimately the role that central banks will play in the operation of the money of the digital age. At present, the direct link between the real economy (households and businesses) and the central bank is essentially cash. However, the financial transactions of the 21st century require less and less cash, which raises the question of what form of money central banks can use in the future to ensure this level of direct contact.

Central bank digital currency (CBDC) is a digitally available central bank liability that differs from the currently known forms of central bank money; from cash in that it is digital and from account money held by commercial banks in that it represents a direct claim by the public and companies on the central bank. The question may arise as to why a widely available central bank digital currency might be needed in the future, and what features it might have that today's digitally available money, issued mainly by commercial banks, does not have or has only to a limited extent. These possible properties are briefly discussed below.

**Widespread accessibility:** While the spread of electronic financial services has led to more and more people using convenient and fast solutions from banks and payment service providers, the limitation is typically the extent of bank account usage. In other words, citizens who, either because of their financial situation or because of their own choice, do not have access to a bank or do not actively use one, are excluded from access to financial services. The proportion of unbanked people in Hungary is around 13 per cent of the adult population, more than two and a half times the 5 per cent seen in the US or the euro area. And the proportion of the population with a bank account but not actively banking is even higher. The central bank digital currency, which is available as a citizen's right, can help to shift these layers towards electronic channels, making financial transactions easier, faster and cheaper for them and for commercial entities and service providers. The digital euro or digital dollar project, among others, has set itself the goal of ensuring this, but developing countries such as Mexico, Ghana and Nigeria are also prioritising this goal alongside developed countries.

Accessible at low costs: For widespread, active use, it is essential that the new scheme is attractive to those who do not currently use financial services. This requires low-cost or even free access to basic services. Providing this framework can also open the door to digital finances and account use for groups in society such as pensioners and people with low incomes.

**Suitable for digital and large-scale targeted public transfers:** If it is ensured that anyone has access to the central bank digital currency, the newly created framework, which will also work with existing acquiring networks, could be suitable for sending even targeted public transfers without the need for additional coordination, such as personal delivery to a home address or other administrative processes to reach the rightful recipients. The importance of targeted subsidies and remote access was also highlighted by the closures surrounding the COVID 19 outbreak. In China, this could be implemented as early as in 2020, at first through the two digital payment service platforms in the market, while in the US, for example, the authorities could only deliver the stimulus packages by paper cheques through the post. In the future, in such or similar cases, not only the access to the aid, but also the spending of it may be fast, electronic or even targeted. This latter could either take the form of specifying the time available for use or the purposes for which the spending are to be used.

**Interest rate:** An important feature of central bank digital currency could be the interest rate that can be directly determined and enforced by the central bank. This could help improve the efficiency of the central bank's decisions. The interest rate channel of monetary transmission is amplified, allowing the central bank to achieve its statutory objectives more quickly and efficiently. On the other hand, the direct interest rate channel increases competition in the banking system, which makes central bank conditions more effective for retail players—increasing the interest income of the population and encouraging banks to operate more efficiently. In order to preserve the stability of the financial system, there is also the question of limiting the amount of the asset or introducing interest rate bands, where above a certain amount, users are not interested in increasing their savings in the form of CBDC.

"Programmable money": It is an important design consideration that digitalisation should not be understood as simply moving traditional processes into the digital space, but should also allow for innovative solutions that go beyond previous frameworks and opportunities, in this case to improve the financial services market as a whole. By making money "programmable" through the use of smart contracts, it could be possible to automatically effectuate the decisions affecting central bank digital currency in a pre-defined way, so that digitally executed financial transactions can be carried out automatically as soon as the pre-defined conditions occur. In addition, with the wider use of smart contracts, pre-programmed financial services could emerge that could replace processes that are currently still manual. It is mainly these uses that are being explored by the so-called wholesale or professional service provider digital currency constructions. In this context, the research conducted so far within the BIS Innovation Network can be mentioned; Project Helvetia, for example, mainly investigated the efficiency benefits of automated Payment-to-Payment or Delivery-vs-Payment transactions with central bank digital currency in the money or securities market. In practice, a large part of the back-office workload can be replaced by a smart contract platform based on a central bank digital currency, reducing the time needed to complete a transaction from days to seconds. Similarly ambitious targets can be set for the simplification of cross-border payments through the central bank digital currency. These are being researched by the Bank for International Settlements (BIS) in the framework of the Project mBridge or the Project Dunbar; into the latter, the MNB's digitalisation area could also join. In addition, programmability and the use of smart contracts can also be relevant in the retail segment: It can even enable the automation of complex processes, for example, in the case of a real estate or car purchase, the official property or car registration is automatically effectuated in real time after the payment is made. A similar programmed solution can be used for a number of Machine-to-Machine financial transactions, such as automated payment for your car when you fill up or park it, or automated payment for the energy you use in your smart home.

**Back-up system including even offline payment option:** In certain extreme cases, such as natural disasters, mobile network outages or power cuts, the possibility to make electronic payments may be limited. Likewise, temporary difficulties may arise if any of the players involved in today's card payment and transfer system experience problems, either due to a service outage or a cyber-attack. If the public or businesses are already used to digital payments, but the availability of these becomes limited in the above situations, it may be necessary to provide an electronic payment facility in addition to cash, which can ensure that digital wallets or other means can be used for payments until the situation returns to normal. Technologies already exist to achieve these goals. A modern and robust digital platform, designed to meet future needs, to be created by the central bank, could play a bridging role in such situations. Ongoing research in the area of central bank digital currency in Sweden and Japan, for example, is also aiming in this direction.

# **2** Domestic FinTech sector

The growth trajectory of the domestic FinTech sector was not interrupted even in 2020, the year of the general economic downturn caused by the coronavirus pandemic: The value of turnover and profit generated by the sector reached a new record. The Hungarian FinTech ecosystem now includes 146 Hungarian-based companies, of which the share of B2B service providers remains significant. The dominance of the share of micro and small enterprises in the size distribution of enterprises has been further strengthened by the new entrants. The operating results of these small firms show that high value-added firms are also increasingly active in export activities. Nearly two-thirds of the firms were still involved in financial software development and systems integration, payment services or data analytics and business intelligence in 2020. Examining the ownership background of the players in the Hungarian FinTech sector reveals that one in four Hungarian FinTech companies has received at least one round of venture capital investment, and that a quarter of the domestic market is made up of Hungarian subsidiaries of foreign companies. By the end of 2021, the number of people directly employed by the sector exceeded 8,000. The MNB Innovation Hub continues to be an important pillar of the domestic ecosystem, as evidenced by the continuous inquiries from innovative market players. The MNB is committed to supporting innovation and digitalisation on a broad scale and to strengthening the domestic FinTech ecosystem through both domestic and international cooperation.



Note: Companies that submitted accounts to the National Tax and Custom Authority (NTCA) at least for 2020 are shown. Source: NTCA, MNB.

## 2.1 ANALYSIS OF THE DOMESTIC FINTECH SECTOR BY COMPANY SIZE AND NUMBER OF EMPLOYEES

The domestic FinTech ecosystem has continued to expand, with 146 FinTech companies actively operating in Hungary in 2020. Companies engaged in FinTech activities were identified from a set of companies operating in 2021<sup>11</sup>, filtered based on the scope of activities that corresponded to the definition used, after a web scraping of the websites and detailed examination of the potential companies (Chart 31). Mergers and liquidations/windings-up have been observed in several cases within the sector, but, despite this, the number of FinTech companies has continued to grow. The expansion of active FinTech firms has basically been driven by two sources: on the one hand, either newly founded FinTech startups or subsidiaries of international players have started their activities in the country, and on the other hand, firms that have been active for a long time but previously only in other field(s) have become active in FinTech. The majority of FinTech companies in Hungary have a B2B (business to business) business model, which shows that within the sector, FinTech companies are not primarily present as the challengers of the incumbents in the financial sector, but as their partners.

<sup>&</sup>lt;sup>11</sup> In our analysis, the Hungarian FinTech sector comprises only companies with a Hungarian tax number, operating in a corporate form and active in 2021 (in their case, the latest available annual reports—and thus our assessment—refer to 2020). For details on the identification methodology, see the MNB FinTech and Digitalisation Report 2020, Box 3.



Note: Company size was determined on the basis of the 2020 reports and year-end or annual average staff number data. Source: NTCA. MNB.



Almost 80 per cent of FinTech companies operating in Hungary are micro or small businesses. In the case of both domestic and foreign-owned FinTech companies, micro and small enterprises are in vast majority. Their aggregate share of the total sector increased to 79 per cent (Chart 32). One positive outcome of the development of the domestic ecosystem is that the growth in 2020 was primarily driven by a 6 percentage point increase in the number and share of small firms. Domestically-owned FinTech companies are generally smaller: micro companies represent about 55 per cent of all domestically-owned companies, while the share of medium-sized companies is only 26 per cent. The proportion of small and medium-sized size categories remains higher in the case of foreign-owned FinTech companies. The typically large size of these firms is partly due to the fact that most of them are relatively old and/ or have added FinTech services to their previous scope of activities, or have a dedicated role in the international FinTech value chain. In contrast, domestic companies are mostly new and providing FinTech service as their main focus.

Expansion has begun in several segments, but nearly two-thirds of the domestic players are still made up of companies in financial software development and systems integration, payment services, and data analytics and **business intelligence** (Chart 33). The number of companies involved in financial software development and systems integration grew at the same rate as last year, accounting for more than a quarter of the sector's companies. The fact that the number of players involved in the digitalisation efforts of typically domestic incumbent institutions has also continued to grow is an indication of the domestic implementation of cooperations in the international banking and FinTech sector. In addition, the number of domestically founded FinTech companies entering into cooperation with international incumbents is also increasing, to a lesser extent though. Among the segments with a smaller share in the domestic sector compared to the previous year, but in line with global trends, cybersecurity, investment, finance and insurance as well as digital transformation consultancy also showed increasing activity.







Source: NTCA, MNB.

In the new normal following the first waves of the pandemic, the number of people employed in the domestic FinTech sector has expanded more than ever before. The dynamic growth of the sector was already evident in previous years. Between 2015 and 2020, the average annual growth rate of more than 15 per cent doubled the number of people in employment. Based on the number of employees already available in November 2021, the number of people employed in the domestic FinTech sector increased by almost another thirty per cent from 2020 to 2021, with no change in the ranking by the scope of services (Chart 34). The expansion was mainly driven by growth in medium and large companies. The biggest percentage change was in investment, finance and insurance, where the number of employees almost doubled—in just one year. The biggest change was in the areas of financial software development and systems integration, where there was a more than one and a half times increase in one year. On the whole, the rising employment figures for the domestic FinTech ecosystem in 2021 are in line with international trends. Based on current knowledge, this is expected to persist in the longer term as well, which is a desirable development both in terms of the level of digitalisation of the domestic economy and the availability of financial services.

#### Box 4

#### MNB initiatives to strengthen the FinTech ecosystem in Hungary

Encouraging the development of broad-based FinTech-incumbent relationships and strengthening the domestic FinTech ecosystem is a priority for the MNB. To this end, the MNB not only supports the spread of forward-looking, yet secure solutions, but also actively cooperates with the players in this sector to ensure that solutions that strengthen digitalisation and international competitiveness are more widely available on the domestic market.

The MNB Innovation Hub framework of supporting financial innovation has been serving the development of the domestic market for four years. The MNB's financial innovation platform (Innovation Hub) was launched in 2018 as a forum for direct and flexible contact with innovators. During the life of the initiative, the MNB was able to provide swift and expert guidance on various regulatory dilemmas related to financial innovation in nearly 150 cases, for both domestic and foreign-based businesses. As a player in the international innovation ecosystem, the MNB is also an active member of the Global Financial Innovation Network (GFIN).

The MNB chatbot, which has been active since December 2020, was expanded in 2021 to include more information on central bank areas. The MNB was a pioneer among European central banks in introducing its own chatbot. The Pallas Athéné pilot chatbot project supports the strengthening of Hungarian artificial intelligence (AI) innovation efforts with the involvement of Hungarian FinTech players. With the 2021 knowledge base enhancements, the MNB's chatbot project is available in five dedicated topics (financial innovation, consumer protection, supervisory licensing, statistics and the electronic system for receiving authenticated data (ERA)) complementing the initial three, but the MNB is continuously exploring the possibility of further enhancements.

The MNB has launched its own mobile application to test the potential in blockchain technology. In connection with the opening of the Money Museum this year, the MNB launched the Money Museum mobile app on 18 May 2022 on the International Museum Day. In addition to displaying content related to the Money Museum, the

innovative mobile application offers visitors solutions supported by blockchain technology. On the one hand, users of the app can win NFTs with a unique serial number, in our case digital coin images, by completing playful financial education quizzes. The NFT collections are accompanied by periodic prize draws. The first of these is linked to the 75th anniversary of the introduction of the forint, where users in possession of 6 different coin images (NFT) giving the word FORINT, can win one of the physical coin sets containing glossy versions of the five-forint circulation coins issued on the occasion of the introduction of the forint. On the other hand, the app allows coin collectors to register their own unique QR-coded physical commemorative coins, creating their own digital collection. The resulting digital coin registrations can later be transferred within the application and the ownership history can be tracked transparently on the blockchain.

The functionality of the MNB Digital Student Safe mobile application, which aims to improve financial awareness and financial inclusion, will be expanded in 2022 in close cooperation with industry players. The Digital Student Safe is a free mobile application for the 8–14-year-olds, which was launched in the autumn of 2020 in cooperation between the central bank and a Hungarian FinTech company. The app is a playful, digital way to help primary school students learn the basics of finance while involving their parents as well. The further development of the application, which already has thousands of users, started at the end of 2021 in cooperation between domestic FinTech players, domestic credit institutions and the central bank, and is expected to be available to the general public in autumn 2022. The app will be enhanced with a number of features, and it is planned to be able to handle transactions involving real money.

In November 2021, the MNB organised the World FinTech Festival in Budapest for the second time, in cooperation with the Singapore FinTech Festival. The Singapore FinTech Festival (SFF) is the world's largest financial digitalisation and innovation event, organised by the Monetary Authority of Singapore (MAS). The SFF is a global platform for the FinTech community, bringing together the world's FinTech players, technology innovators, policy makers, financial sector leaders, investors—including private equity and venture capital—and academia. Organised for the sixth time in 2021, the festival was open to the public online for 5 days and 11 global co-events were also available to join in. From Europe, only Copenhagen and Budapest, as official co-host, were present.

On the second day of the event, the Hungarian Embassy in Singapore hosted the first Hungary–Singapore FinTech Business Forum, involving FinTech associations, central banks and selected companies from both countries. In 2020, the MAS and the MNB signed a cooperation agreement to strengthen the joint work on FinTech innovations between Singapore and Hungary, and in 2021, a cooperation agreement was signed between the Hungarian and Singapore FinTech Associations to actively seek opportunities for joint projects, research activities and support each other in achieving common business goals. At the end of the event in Budapest, 10 Hungarian FinTech companies were given the opportunity to present their activities to an international audience.

Breakdown by number of players in the domestic FinTech sector by year-on-year change in revenue and profit after tax



Note: The set of companies examined is the set of companies that have filed reports for two consecutive years. For this reason, companies reporting for the first time in 2020 are not included in the graph. Source: NTCA, MNB.

#### Chart 36 Profitability of the FinTech sector



Chart 37

Distribution of profitable and loss-making companies in the total domestic FinTech sector by year



## 2.2 SALES REVENUE AND PROFITABILITY OF THE DOMESTIC FINTECH SECTOR

In 2020, the domestic FinTech sector was characterised by increasing sales revenue and further improvement in profitability. For the sector as a whole, the changes caused by the pandemic and the rise of digitalisation have created growth opportunities. In the first year of the coronavirus pandemic, the combined sales revenue of domestic FinTech companies exceeded HUF 170 billion, while the profitability ratio reflecting their efficiency rose by 1 percentage point to 9 per cent.

Two out of three domestic operators managed to increase their sales revenues and profits in 2020 (Chart 35). The sector's turnover increased by more than HUF 40 billion and its profit after tax by more than HUF 5 billion in a single year. The average revenue growth rate of growing firms was above HUF 150 million, while the median value was HUF 23 million. The majority of companies (57 per cent) also achieved an increase in profit after tax. This value increased by an average of HUF 42 million, while their median profit increase was HUF 3 million. On the whole, it can be said that the large and powerful players have been able to take advantage of the exceptional situation to a greater extent, but micro and small enterprises, which make up the majority of the sector, have also been able to take advantage of the market opportunities created by the unexpected situation.

The growth in sectoral level return on equity (ROE) has stalled (Chart 36). The sector's cumulative equity increased by almost five times (HUF 25.5 billion) during 2020 compared to the sector's cumulative profit, while the sales revenue grew at an accelerating pace. The reversal of the ROE trend is therefore fundamentally driven by the continued increase in the FinTech sector's ability to attract capital as well as by the later return of the invested capital. The supposed reason for the latter may be the focus of the operators on growth and market acquisition.

Many domestic FinTech companies are already profitable as micro-enterprises. Although the share of profitable firms, including profitable micro-enterprises, has been declining for years due to the continuous expansion of FinTech startups (Chart 37), the share of profitable firms in this company size improved by 2.5 percentage points from 2019 to 2020 (Chart 38). In contrast, the share of profitable players in the small and medium-sized enterprise segment decreased slightly from 2019 to 2020. While for the former, nine out of ten companies made a profit in the last closed financial year, the same proportion was slightly

Distribution of profitable and loss-making companies in the domestic FinTech sector by size



Source: NTCA, MNB.





Source: Ministry of Justice (National Company Register and Information System), MNB.

lower for medium-sized companies (89 per cent). The profitability of domestic FinTech firms—which is less typical internationally—is probably also due to the fact that they have a more moderate growth dynamic, are less expected to achieve explosive growth rates and are typically B2B focused, which often means a more stable revenue base.

# 2.3 THE INVESTOR BACKGROUND OF THE DOMESTIC FINTECH SECTOR

The domestic FinTech companies typically have three owners. The division of the owners of an average company actively engaged in FinTech activity registered in Hungary has two individuals and one institutional investor at the same time. A quarter of the domestic FinTech market is made up of Hungarian subsidiaries of foreign companies.

In the medium term, the role of venture capital in the domestic FinTech sector could be further strengthened. The distribution of investors behind domestic players is still dominated by domestic individuals. They are followed by domestic and foreign venture capital investors, then foreign parent companies. However, based on international funding trends<sup>12</sup>, the presence of the latter two segments in the domestic FinTech sector is expected to increase in the medium term.

One in four domestic FinTech companies has received at least one round of venture capital investment since its inception. In micro-enterprises, the presence of domestic venture capitalists and private investors is most common. For small companies, apart from the private investors, there are also domestic and foreign venture capital investors, less frequently but in similar proportions. Furthermore, in this company size, the presence of private owners is almost matched by the presence of wholly foreign parent ownership. Medium-sized companies are now part of the portfolio of more institutional investors: in almost one in six medium-sized companies a domestic venture capital investor has a share, while for foreign investors this is already the case for one in five companies. In the large enterprises of the domestic sector, only the foreign parent companies of the enterprise have a share (Chart 39).

The vast majority of the domestic FinTech ecosystem is based in the capital city. 88 per cent of the FinTech firms are based in Central Hungary. Other players in the sector are equally distributed in the whole of Transdanubia, Northern Hungary and the Southern Great Plain region.

<sup>12</sup> For more details on financing trends in the global FinTech sector, see subsection 1.3.

The relationship between the export activity of FinTech companies and their value added in terms of the number of employees



Note: The minimum, maximum, lower and upper quartile, and median values are shown in the figure. By exporting companies we mean companies whose sales revenue is at least 10% from export activities. Source: NTCA, MNB.

## 2.4 THE EXPORT ACTIVITY OF THE DOMESTIC FINTECH SECTOR AND THE DEVELOPMENT OF START-UPS

A strong link can be identified between value added per employee and export activity. FinTech firms that also export services tend to have a higher value added, regardless of the type of activity and the size of the firm, as confirmed by the regression analysis. This is mainly because the scalability of the activity can be better achieved through exports and the economies of scale can be better exploited. Analyses presented in the previous FinTech and Digitalisation Reports published in 2020 and 2021 show that exporting services as a strategic choice allows for a more dynamic increase in sales revenue, also underpinning the change in scale, which can be supported by better capitalisation (Chart 40).

# **3 Digitalisation level of the Hungarian banking sector**

The MNB assessed the level of digitalisation of domestic banking players for the third time now. Covering more than 90 per cent of the domestic banking system in terms of balance sheet total, the study found that the digital maturity of domestic banks continued to improve during 2021. While the credit institutions at the forefront of digitalisation continued to make progress, and the less digitalised banks were also catching up, the whole banking system has not yet been able to exceed the medium level of development. The strengths of domestic credit institutions are in the management and the partner and customer pillars representing the interactions with external stakeholders. At the same time, the system and workflow, focusing on internal operations, as well as the digitalisation measured in the workforce pillars remained at a similar level as in previous years. The lack of digitalisation of the pillars supporting internal operations could become critical for maintaining the competitiveness of the sector—especially in the face of competition from emerging innovative players. A significant future improvement in the level of digitalisation of the product pillar would also be key in the competition of products and services which is increasingly transparent, as the rapid and large-scale advances caused by the pandemic can be seen as a one-off event for the time being. The benchmarking of the comprehensive digital transformation strategies, prepared and submitted in line with the central bank's internationally ground-breaking recommendation to further strengthen the digitalisation of the domestic banking system, will start in 2022.



# 3.1 DIGITALISATION OF THE DOMESTIC BANKING SYSTEM

According to the MNB survey, the digital maturity of the domestic banking system has further improved. The MNB assessed the digital maturity of the domestic banking system for 2021 again, along 7 main pillars (Chart 41). The survey, now in its third edition, covered 90 per cent of the domestic banking sector in terms of balance sheet total. The annual survey contains about 280 questions, the vast majority of which remain unchanged from year to year, providing a picture of the current state of play in the 7 main pillars, with a small number of questions updated regularly to provide insights into technological developments in the banking sector and to track the general trends of digitalisation.

The digital maturity of banks continued to improve over the past year, but the banking system as a whole has not yet surpassed the medium level of maturity. The median bank's composite index for 2021 reached a level of 61, a substantial improvement from 56<sup>13</sup> a year ago. In addition to the median value, the minimum and maximum values have also increased, meaning that while the credit institutions at the forefront of digitalisation have continued

<sup>&</sup>lt;sup>13</sup> The score of 56 for 2020 is the score calculated according to the new methodology in the annex to the 2021 FinTech and Digitalisation Report, and it was used to produce the new index comparing 2020 and 2021. However, according to the 2021 FinTech and Digitalisation Report's methodology for that year, the composite index at that time had a median score of 58.

Evolution of the scores by pillars and the total points of the digitalisation development index of the domestic banking system



Note: The chart represents the minimum, the maximum, the lower and the upper quartiles, and the median values. The values of 2020, used for the comparison, were prepared based on the new methodology in the annex to the 2021 FinTech and Digitalisation Report. Source: MNB.

# Chart 43 Availability of digitally accessible products

100



Note: The weighting was done in proportion to the total assets of the institutions surveyed. Despite the decline in home insurance and the investment account closing, the range of banks providing digital access did not change, the decline was due to a technical factor, the change in market shares in proportion to the balance sheets total. Source: MNB.

to improve, the catching-up of less digitalised banks could also be observed. The gap between the leaders and the laggards has narrowed in all other areas, except for process digitalisation, suggesting that competition is increasing.

Looking at the trends along each pillar, it can be seen that the sector is doing best in the management and workforce pillars, which represent the preparedness of managers and employees, i.e. digitalisation is playing an increasingly important role in the organisational culture of banks. Significant progress has been made in the product, client and partner pillars, which represent interactions with external stakeholders, but there is still a high degree of variation in the digital maturity of domestic banks in these areas. The workflow and system pillars measuring the level of digitalisation of internal operations have only slightly improved, similarly to recent years, although the digitalisation and automation of internal operations cannot be postponed for long in order to achieve a longer-term digital transformation (Chart 42).

## 3.2 DIGITALISATION OF INTERACTIONS WITH EXTERNAL STAKEHOLDERS

In 2021, digital access to banking products has improved at an unprecedented rate. Although 2020 already saw significant progress in the digital accessibility of domestic banking products, 2021 surpassed even this. This can be explained by the persistence of the COVID-19 pandemic and its role as a catalyst for digitalisation as well as by the maturation of the first wave of digitalisation developments launched in 2020.

Digital access to certain banking products is increasingly becoming a basic service. Current account opening is now available digitally at all the credit institutions included in the analysis, and digital availability is above 90 per cent for personal loans, using a weighting proportional to the balance sheet total (Chart 43). The largest increase is in the digital accessibility of investment accounts, suggesting that domestic banks have recognised the growing demand from clients for investment products and their quick and easy remote accessibility. International FinTech companies are also increasingly active in this market, so the move was also justified by competitiveness considerations. A similar trend can be observed for products linked to online payment





*Note: In the proportion of respondents. Source: MNB.* 

#### Chart 45

Applying pricing incentives in case of using certain service types through digital channels



Note: The weighting was done in proportion to the total assets of the institutions surveyed. Source: MNB. services (see Box 5 in this respect), where international competition is also strong and where there is room for substantial improvement in the availability of virtual cards (Chart 44). In general, there has been significant progress in the digital accessibility of several banking products, mainly for retail clients, while there was no progress so far in business-related services (e.g. investment loans).

The use of digital channels is supported both by the solutions facilitating the navigation in the digital space and pricing incentives. All the institutions surveyed support navigation on their online interfaces by FAQs, and a significant majority of banks also offer uniform guides, tutorial videos and chatbot solutions. Banks are also trying to support the spread of online banking with pricing incentives, although for the time being only for current account transactions. In the future, it would be advantageous to incentivise digital recourse with better pricing for making deposits and taking loans (Chart 45). In parallel with the online platforms, digital solutions supporting customer convenience are also increasingly present in the branch office administration processes: almost all banks offer now advance appointment booking, but the institutions are also increasingly introducing signature pads and easy-to-fill electronic forms. These solutions are designed to improve the smoothness and speed of administration in the branches.



Note: The weighting was done in proportion to the total assets of the institutions surveyed. Source: MNB.

No No



	C		20	40	60	80	100
	2020		1	4	1	:	cent
Information in branches	s ·				-		Per
	2021		-		2 3 3		
Online advortising	2020		1				
Online advertising	2021		-				
	2020		:				
Pricing of products			-		5 5 5		
	2021		:				
Newsletter	2020					<u> </u>	
	2021						
	2020						
Other	2020						cent
	2021		:				Per
	0	2	20	40	60	80	100
		Y	'es				
			lo				

Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.

The domestic banking system is committed to developing financial culture and awareness. Without exception, all domestic credit institutions aim to develop financial literacy and awareness as a strategic goal. In practice, however, they address the issue in different ways and with different intensity (Chart 46). Financial awareness and responsible, prudent individual financial decisions are of paramount importance because they can make families more financially secure, contributing to their well-being, to the strengthening of the economy and to the longterm stability and growth of the financial intermediation system. Developing financial literacy and awareness in the digital space requires further efforts and a new approach, because those excluded from digital financial services due to their skills or abilities are at risk of long-term isolation and exclusion.

The domestic banks are paying considerable attention to encouraging the use of digital solutions. In line with the digitalisation developments in the sector in recent years, the sector is increasingly focusing its efforts on driving its clients towards digital solutions. In addition to the varied pricing incentives presented earlier (Chart 47), dedicated campaigns and extensive media activity (e.g. online events and social media presence) are also used. However, the effectiveness of this activity is not only welcome from a convenience aspect, but also from an environmental and sustainability point of view. Last but not least, the digital solutions replacing paper can be a cost-saving factor for banks and clients alike.



Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.

#### Chart 49

What proportion of corporate customers at banks received regular monthly bank account statements electronically in each year



Note: The weighting was done in proportion to the total assets of the institutions surveyed. Source: MNB. awareness and cheaper pricing for purely digital banking services, but this process has been dramatically accelerated by the pandemic. By the end of 2021, in more than 85 per cent of the banking sector on a balance sheet total basis, and at least 70 per cent of the retail customer base, received their bank account statements digitally. From a consumer perspective, this means that only less than a third of account holders use paper statements now (Chart 48). A similar trend towards digital connectivity was also observed in the corporate sector over the past two years. However, there is still considerable variation across institutions, which may be influenced not only by the banks' pricing incentives, but also by the accounting obligations of firms on the buyer side (Chart 49).

More than two thirds of Hungarian retail customers now

receive their bank statements in digital format. In the

uptake of electronic statements there has been a significant

progress over the past three years. The move away from

paper statements was initially catalysed by environmental

How typical it is at particular banks that clients receive digital notifications about their loan product



Note: In the proportion of respondents. During the calculation those institutions which are not selling that particular product were not considered.

Source: MNB

#### Chart 51 Channels through which digital notifications typically arrive



Note: Based on the aggregation of the 5 product groups examined (credit line debt and overdraft, personal and housing loan debt, bank account statements). The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.

It is also becoming more and more common for the bank to send a digital signal when a loan is in arrears. Significant progress has been made on the digital availability of personal debt notifications, in particular through netbanking and mobile banking, as the share of banks informing all customers on these platforms has tripled. Digital notification of the due date and existence of home loans is also available at several institutions, but there is still considerable room for improvement: in the case of netbanking, this option is available at more than half of the sector, but at barely a third of the sector in the case of mobile banking. Most clients can receive fast, personalised information digitally when they exceed their overdraft limit, or when they are notified of overdue and outstanding debts. It is important to stress, however, that while the availability of digital customer information is improving, in order to reap the efficiency benefits, customers must also be open to change (Chart 50).

Mobile banking and netbanking have become the main customer communication platforms for banks (Chart 51). The near doubling of mobile banking activity in less than a year is partly due to the growing popularity of mobile usage in general, and partly to new, more modern and user-friendly applications released by domestic institutions. In addition, a not insignificant factor is the strong customer authentication that is mandatory for online payments from 2021, requiring a two-factor identification of customers, which is already mostly done by consumers through mobile banking apps.

Availability of real-time access to credit assessments for customers on digital platforms



Note: The weighting was done in proportion to the total assets of the institutions surveyed. Source: MNB.

#### Chart 53 Distribution of retail and corporate customers by channel usage



Note: Based on the banks' self-declaration, in proportion to the total number of customers. Source: MNB. loan has an important added value, in the case of both online, where possible, and offline applications. However, regarding personal loans, only nearly half of the sector offers this option to customers, and in the case of home loans, the same proportion is below ten per cent in terms of balance sheet total (Chart 52). The traceability of these processes would not only significantly improve the customer experience, but could also reduce the burden on the employees of credit institutions who may receive such requests. Furthermore, in the event of deficiencies or other problems, the customers could even proactively help to ensure that the credit approval process is successfully completed as soon as possible, which is in the interest of both parties.

The availability of real-time trackable credit assessments

on digital interfaces could be further developed. The

ability for the customer to follow the bank's processes in real time after applying for a home loan or personal

The share of branch-only customers has fallen dramatically, and the share of omni-channel customers has skyrocketed. The spread of digital financial solutions seems to be unstoppable. The number of people using online banking apps is constantly growing: more than a quarter of the Hungarian population now bank almost exclusively via their smartphones. At the same time, the proportion of "branch only" customers has also changed significantly; in 2021, typically only one in six customers visited a branch compared to around 50 per cent in previous years. But, with 38 per cent, the highest is the percentage of customers actively using both physical and digital channels (Chart 53).

Almost all business customers now also use digital channels (95 per cent overall). The channel usage of corporate customers is somewhat different from that of retail customers due to the heterogeneity of the transactions, resulting in a dominance of omni-channel and netbanking usage. With the increasing uptake of digital banking, the varying frequency of cash use (largeramount branch deposits and withdrawals) and the pricing of individual branch operations may make omni-channel banking preferable, while the uptake of netbanks may be driven by the fact that mobile banking applications are primarily designed for the habits of retail users.



Source: MNB.

Chart 55 Automatic renewal of cooperation agreements with existing suppliers



Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB

#### Chart 56

#### Development of applicants to domestic banking incubation programmes



The use of social media platforms has continued to grow in the banking sector and is now considered essential. At the sector level, as in previous years, credit institutions continued to spend around 30 per cent of total marketing expenditure on digital marketing in 2021, and the number of dedicated human resources did not increase significantly. Nevertheless, there was an increase in both the intensity of appearances and the number of regularly used interfaces (Chart 54). On the one hand, this may be explained by the dramatic increase in the proportion of customers banking exclusively digitally, with internet usage and increasing penetration of social media being identified as significant factors in the background. On the other hand, the need to reach the younger generation entering the banking system has also become cardinal, as reaching them through other traditional means (e.g. TV, radio, billboards or physical outreach) is becoming less effective.

Digital interaction with supplier partners can contribute to the efficient operation of a bank by significantly reducing costs. Regular, standardised communication with external and internal partners can be automated, but substantial improvements are needed on the banks' side. In 2021, only around 37 per cent of the banks, in terms of balance sheet total, renewed automatically their cooperation with existing suppliers, i.e. it more than doubled in two years (Chart 55).

There is a growing openness to cooperation with innovative actors. Domestic banks are actively looking to partner with FinTech companies, but the number of solutions integrated into their operations is only slowly increasing (Chart 56). Institutions with incubation programmes typically have a live business relationship with several FinTechs, but the model, despite this, is not scaling up, and the number of domestic institutions running incubation programmes is not expected to increase, according to the institutions. Meanwhile, there are already active partnerships with other innovative service providers: Partnerships with Big Tech companies and/or platform providers are present in 80 per cent of the banks, while 60 per cent of respondents also have dedicated partnerships with other banks and non-banking actors to support open banking.

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#### Box 5

Retail payment habits – nearly half of the youngest adult age group use mobile phones for payments and a fifth use non-bank FinTech apps for online purchases

For the Magyar Nemzeti Bank, it is important to examine the payment habits of market participants and, within this, the proportion of electronic payment methods used. In the latest MNB study on payment habits<sup>14</sup>, the authors examined the payment habits of the population using data from a representative survey conducted in autumn 2020. Our results show that 80 per cent of the population use electronic payment methods. Electronic payments are also popular for bill payments and online purchases. In addition, more modern solutions, such as mobile payment solutions and non-bank FinTech payment applications, are increasingly being used.

A quarter of the adult population already use a mobile phone for payments in at least one payment situation. Most people, 62 per cent of those who pay by mobile phone, do so for online purchases, but the proportion of people who pay by mobile phone for parking (not by sending a text message, but by using a mobile phone app) and for shop purchases is almost the same, at 57 per cent and 55 per cent respectively. And 35 per cent of people who pay by mobile phone use the private-to-private payment service.

**36** per cent of online shoppers pay using a non-bank FinTech payment application in this situation. Almost a third of the population shop online, almost all of them use some form of electronic payment solution, and almost a third of those who shop online only pay electronically in this payment situation. Looking at the electronic payment options separately, online payment by credit card and card payment on receipt are the most popular with nearly three quarters of online shoppers using these payment methods. This is followed by payments by individual transfer and non-bank FinTech payment applications with 47 and 36 per cent respectively. It is also important to note that the frequency with which payment methods are used may also vary. Those who use individual credit transfers and non-bank payment methods for online shopping indicated a higher proportion of regular use than those who use credit cards. In the case of these results, it should also be taken into account that online shopping may have more limited payment options than other payment situations.

The young generation is more open to new payment options. Nearly half of the youngest adult age group use mobile

payments and a fifth uses non-bank FinTech payment options for online purchases. When looking at groups based on different socio-demographic factors, it can be seen that there is a significant difference in the openness to electronic payments between groups. The use of electronic payment methods decreases with age and increases with education level and household income per capita. In terms of employment status, population in active employment and students are the most open to electronic payments, while the retired are the least open. This is also visible in the use of non-bank FinTech payment solutions for mobile payments and online shopping. In the case of age, while in the youngest age group, the 18-29 years old, half and one fifth of the age group use the abovementioned solutions, the usage rate decreases with age, but even for the over-50s, some people still use these options (Chart 57).



<sup>&</sup>lt;sup>14</sup> Vivien Deák – István Nemecskó – Tamás Végső: Payment habits of the population in 2020 <u>mnb-tanulma-ny-hun-143-lakossagi-fizetesi-szokasok.</u> <u>pdf</u>



Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.





Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.

## 3.3 PREPAREDNESS OF MANAGEMENT AND WORKFORCE

Although the potential of digitalisation was recognised by the banking sector before the pandemic, the "new normal", after the 2020 pandemic situation, was necessary so that it receives the right priority in the decision-making of banks. Digitalisation at the organisation level has been a key strategic objective for institutions for several years, meaning that the majority of the banking sector is not only looking to optimise IT costs, but also to achieve digital transformation at the institutional level. However, real commitment was born only in the last three years. In addition to the development of the digital maturity of institutions, the pressure from emerging innovative players—and thus consumers—may have contributed to this: while in 2019, only a third of the sector aimed at product- and process-specific digitalisation with a narrow focus, by the end of 2021, the entire sector had adopted a comprehensive digitalisation approach (Chart 58).

By 2021, domestic institutions became ready to meet the challenges of digitalisation, supported by the development of organisational cultures. According to the self-assessment of domestic institutions, the challenges of digital transformation are becoming less of a problem for them, in line with international trends: while barely two thirds of the domestic banking system considered themselves prepared before the pandemic, by the end of 2021, all institutions surveyed, reached a high level of preparedness. There has also been a substantial, positive change in the corporate culture of banks to support the spread of digital solutions (Chart 59). Based on international examples, this factor is critical not only for the successful implementation of digital transformation, but also for the increasingly "phygital" (physical and digital) banking operations.



Note: The weighting was done in proportion to the total assets of the institutions surveyed.

No

Yes

Source: MNB.

#### Chart 61





Note: The weighting was done in proportion to the total assets of the institutions surveyed. Source: MNB.

fact that almost all domestic banks now have a dedicated head of digital banking in their board. What is encouraging is that, in line with the MNB's proposal in its FinTech and Digitalisation Report 2020 and the expectations highlighted in the MNB Recommendation 4/2021 (III.30) (see Box 6 for more details), the number of institutions where the digitalisation officers are already members of the bank's board of directors has quadrupled in three years (Chart 60). In addition, the expert support available in the area of digitalisation is also growing, with a steady increase in both IT and business experts (Chart 61). Based on the international trends, this growth is expected to continue; the largest banks often see themselves as technology companies with banking licences.

The prioritised remuneration of meeting digitalisation targets is still only present in half of the sector in our country. From 2020 to 2021, there was no substantive change in either the institutions' employee performance appraisal system or the bonus systems to ensure that digitalisation-related tasks are positively differentiated. On the whole, half of the institutions surveyed show a higher degree of recognition of completing their digitalisation tasks. Given that achieving digitalisation goals requires first a transformation of corporate culture, then of processes and finally of systems, the representation of all these in the corporate objectives can be key to achieving true digital transformation across the organisation. This is not just an intrinsic value, but essential to meet rapidly changing consumer needs and to keep incumbent institutions competitive with emerging innovative players.

Beyond the areas specifically responsible for banking digitalisation, other dedicated teams within the institution are now actively contributing to the achievement of digitalisation goals. By 2021, data asset analysis teams were already present throughout the domestic banking system. This can be crucial for improving the banks' efficiency in the future, and it is also essential for the customer experience, so that they can be provided with more relevant, personalised offers.

The presence of user experience (UX)-focused design and related methodologies in domestic institutions



Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.

#### Chart 63 Distribution of employees in IT positions in the domestic banking sector



Note: Employees in IT positions were primarily defined as those with a degree in programming, software designer mathematics and general IT. Source: MNB. Design with focus on the user experience (UX) has become commonplace in the banking system. It is a progressive phenomenon that in 2021, there was no domestic institution where the application of principles and methodologies to support design focused on user experience did not appear (Chart 62). In line with this, teams specialising in user experience and user interface (UX/UI) design are already present in four out of five institutions. However, the existence of these competences may also become a basic requirement in the future, if the quality of customer experience provided by FinTech and Big Tech players is expected by domestic consumers from domestic banks. In the closely related areas (process optimisation, customer journey), the domestic sector is also performing well; teams with this focus have been established in almost all institutions.

IT competences, which are an extremely scarce resource, are widely sought by banks. The number of people working in IT positions in the banking sector has been rising steadily for years to provide the human resources needed to support technological progress. A number of organizations that do not provide state-recognised IT qualifications have already responded to the significant labour market demand, as these education platforms are accounting for more than a third of the banking sector's IT workforce (Chart 63). The trend is expected to continue to strengthen in the coming period, as the number of IT jobs continues to grow.

There has been a positive turnaround in the assessment and development of competences required by the digital age at the domestic banks. Since 2019, there has been a significant improvement in the perception of employees' digital literacy. Every year, banks see the need to improve the digital skills not only of dedicated IT employees, but of all employees as increasingly important. At the same time, regular surveys on the level of digital literacy are becoming increasingly common and have practically doubled in the sector in three years: By 2021, four fifths of the institutions carried out a digital literacy survey at least once a year. These activities are critical to maintaining competitiveness at both institutional and sectoral levels. Supporting the development of employees and helping them to advance within the organisation through retraining and development based on surveys can also be an important factor in increasing loyalty to the institution and reducing staff turnover (Chart 64).



Note: The weighting was done in proportion to the total assets of the institutions surveyed.

Source: MNB.

#### Chart 65 How widespread are dedicated project management applications in the banking system for work management tasks



Note: Based on the banks' self-declaration, the weighting was done in proportion to the total assets of the institutions surveyed. Source: MNB. The efficiency of work organisation is improving, along the provision of flexible working. For teleworking, with the exception of branch workers, there was no trend change in 2021 compared to the way work was organised in 2020. Typically, as the pandemic situation has improved in waves, the number of people working from the office has increased, but for both health and flexibility reasons, the availability of working from home is maintained in 2021. In the labour market, this seems to be embedded in the expectations of employees in the long term, in line with the MNB's Recommendation No 12/2022. (XI. 6.) on "IT security requirements for teleworking and remote access". In addition, it is worth highlighting the increasing adoption of project management applications in the sector, which help to improve the efficiency of work organisation, suggesting that operational tasks are also increasingly being carried out on the basis of some kind of project management methodology (Chart 65). This fundamentally strengthens the resilience and capacity for change of incumbent institutions which can make a meaningful contribution to the delivery of more competitive digital financial services.

#### Box 6

#### Evaluation of the banks' digitalisation strategies

In total, the big banks have submitted more than 1,000 pages of thoroughly developed digital transformation strategies, as recommended by the MNB. In March 2021, the MNB issued an internationally ground-breaking recommendation to strengthen the digitalisation of the domestic banking system, according to which each domestic credit institution developed a comprehensive digital transformation strategy and a roadmap for itself by the 31 October 2021 deadline, which were also submitted to the central bank. About 1,000 pages of documents covering all sub-points of the MNB recommendation, including situation assessments and plans, were received from the institutions. Some credit institutions have revised their already existing digital transformation strategy to meet the MNB's requirements, while others in the sector, in the absence of a previous digital transformation strategy, had to prepare and adopt a completely new one.

The areas covered by the strategies vary widely in terms of sophistication, with the emphasis generally on frontend objectives. The presentation of the timing of planned developments varied widely between banks. Although the majority of banks have already prioritised their digitalisation goals in recent years in response to international trends, competitors' actions and the pandemic, the recommendation has led them to broaden their focus areas, specify their timing and rethink their processes. In the case of the majority of banks, front-end goals for products and services are more thoroughly developed than back-end plans for internal efficiency improvements. However, thanks in part to the pandemic, there is also a greater focus on improving corporate culture.

Although the service providers have improved the digital accessibility and usability of banking products and services as a result of the COVID-19 pandemic restrictions, the banks are planning further customer-friendly improvements in line with the MNB's recommendation. The banking strategies detail specific action plans and timelines for improvements to front-end functionality in response to the MNB's expectations. Most banks offer the possibility to perform at least a part of the basic account transactions online, the next step is typically to expand the functionality of the digital account package, launch video banking, develop a status tracking system for online transactions and expand accessibility solutions (e.g. making them available also in the mobile app). At the same time, more and more banks are making the point that it is not worth discriminating against those using traditional channels. Great strides have been made in building online complaint handling channels, and the next step for most banks is further automation of the process. The level of digital equipment of bank branches is not uniform even within the banks, and the aim is to modernise as widely as possible to provide a high level of service to customers who prefer physical channels and to ensure efficient omni-channel transactions.

The banks have recognised the importance of a corporate culture that supports digitalisation and have recently taken a number of steps to improve it. A key element of the recommendation was the appointment of board members responsible for digital transformation, which is expected to ensure that the banks' strategic thinking also addresses the strategic importance of digitalisation. When the recommendation was published, it was common for the banks to provide working from home and to use digital communication solutions (e.g. digital signatures, task tracking) for certain key work processes. As a result of the positive experience with the new working arrangements, the banks have set themselves the long-term goal of flexible, hybrid operations. In addition to the traditional waterfall project management model, the use of agile methodologies is becoming more and more common, but typically only in small teams on a pilot basis. With the focus on digitalisation, the need for digital expertise has increased, and the banks are trying to adapt to this with internal training and targeted recruitment using digital channels. The strategies received include very good examples for the implementation of internal knowledge transfer, innovation-related presentations and workshops or thematic competence development, while comprehensive initiatives to regularly assess the digitalisation level of employees are not yet typical in the strategies—despite the fact that in practice, the banks have reported an increasing number of such initiatives in the MNB's digitalisation survey.

In their plans to digitalise their internal operations, the banks have primarily focused on supporting business, product and service-centric functions. The strategies include the efficient and rapid IT implementation of business development needs through closer cooperation between the two areas, and ensuring faster lead times for specifically

IT projects. Dedicated projects aiming at the improvement of internal operations hardly appear among the banks' objectives, with the main drivers for internal improvements being to support business operations and ensure flexibility by effectively channelling new business needs. In addition to supporting new projects, the banks are working to automate existing internal processes, increase system reliability, reduce operational costs and strengthen cybersecurity. The bank strategies focused on improving data management processes and on developing the targeted and regular use of data. Related to this, most banks also started to think about building ecosystems for data management within the banking group, collaboration with partner firms and a set of services that support customer lifecycles at multiple points, but specific, time-scheduled plans for this are still limited in the strategies.



Note: The weighting is based on the ratio of the total balance sheet of the institutions examined. ITIL is a set of best practice processes for delivering IT services to customers, making systems more efficient to operate and improve.

Source: MNB.

# Chart 67 Prevalence of unified systems or databases



Note: The weighting was done in proportion to the total assets of the institutions surveyed. The 2019 survey did not ask about the availability of a unified archiving system, so 2019 data are not available. Source: MNB.

# 3.4 DIGITALISATION OF INTERNAL OPERATIONS

Solutions that reflect an innovative process approach are common in the banking sector. To optimise processes, most banks have dedicated cross-sectional teams and use a standard framework for the IT development back-testing process (Chart 66). Almost all of the Hungarian banking sector uses ITIL (Information Technology Infrastructure Library) processes, which greatly facilitates the provision of data for process improvement and the resolution of problems related to the provision of services.

Despite the progress that has been made, there is still room for improvement in the area of unified, digital and efficiently managed databases. Creating a unified, structured and up-to-date customer database within a bank has many business benefits, and is becoming a key requirement in the competition with Big Tech and FinTech companies. In addition to the storage and management of data assets, improvements are also needed in their conscious use. Targeted customer offers are becoming more common on the institutions' side, but the customer data collected digitally for these offers cover few data types, similarly to the results of recent years. A related major step forward is the modernisation of document management and archiving systems through digitalisation (Chart 67).

Banking software is becoming more sophisticated and cloud-based solutions are also on the rise. Although the last 1 year did not bring any change in the state of the art of the banking hardware asset base according to the banks' self-assessments, the modernity of the software asset base, which was somewhat lagging behind, has improved slightly according to the self-report of several banks. Progress is also increasingly evident in the use of cloud-based solutions, allowing for more flexible and efficient operations (Chart 68). In addition to all these, the benefits of improving internal systems are already becoming apparent; the costcutting effects of digitalisation increased in 2021 compared to 2020, according to the institutions' self-assessments.

Proportion of institutions using cloud services in the domestic banking sector



*Note: In the proportion of respondents. Source: MNB.* 

#### Chart 69

Evolution of aggregate service disruptions due to incidents reported by large domestic banks



Note: The chart represents the minimum, the maximum, the lower and upper quartiles, the median and the mean values. In case of the mean, the weighting was proportional to the number of respondents. Source: MNB. The availability of a digital customer interface covering an increasing number and range of services, and thus customer satisfaction, is largely affected by system outages that are unfortunately still relatively frequent. Despite the efforts of recent years, the total number of hours of annual system downtime reported to the MNB and available from the banks' data provision has not changed significantly (Chart 69). In 2021, business continuity incidents caused 199 hours of downtime at the median bank; in addition, it is a backward step from the previous median of 165 hours. Although the average downtime has improved from 447 hours to 262 hours as some poor-performing institutions caught up, the increase in median downtime is a notable risk factor. Downtimes can be caused not only by system failures, but also by malicious software, so cybersecurity improvements are also needed to address the problem. It should be stressed that fraudsters and scammers can not only attack institutions, but can also be dangerous to customers, as it is common to see cyber criminals being active on online platforms using the name and image of a bank. (Box 7).

## Box 7 Ransomware

Ransomware is malicious software that, after encrypting data on a computer or mobile device or locking the device, demands money from the users in exchange for unlocking the data. The demand for payment often appears on the screen of the locked device, or is contained in a file alongside the encrypted files, and contains the contact details of the cybercriminal's "customer service" or payment instructions for the amount claimed. Ransom demands are typically made in bitcoin, as the amounts paid in this way are more difficult to trace than traditional bank transfers. In the case of attacks on companies, where larger ransoms are involved, it is often possible to negotiate using the criminals' contact details.

Unfortunately, paying the ransom is no guarantee that the victim will get their data back. Even if one receives anything at all from the blackmailers, there is no guarantee that the encryption key you receive will work and actually unlock the encryption. For this reason, experts recommend that if one falls victim to a ransomware attack, one should never pay, but rather use the right malware protection solution to prevent the damage and back up one's valuable data regularly. At the same time, more sophisticated ransomware attacks also try to locate backups and encrypt or destroy their contents. If you are in trouble, you can get help from the NoMoreRansom project website, a partnership of law enforcement agencies and specialist companies: https://www.nomoreransom.org/

The damage caused by ransomware is increasing every year and the attacks are becoming more and more sophisticated. Criminals want to make sure they get their ransom, so the latest trend is not only to encrypt data, but also to leak confidential information out of the company network and demand a ransom to keep it from being disclosed. In addition, the messages from ransomware attacking companies have a new motive: disgruntled employees are being warned that they can help bring the virus to their company in exchange for a share. There was also a case where criminals first attacked an insurer selling cyber-attack insurance, and then, in possession of the list of its customers, attacked the insured in turn, as those who have insurance against such an eventuality are more likely to pay the ransom. Trends like these are prompting regulators and authorities to look for new ways to crack down on ransomware: money is being prevented from being paid out through conservative enforcement of anti-money-laundering rules, and the criminal gangs behind ransomware are being dismantled in large-scale international operations.

# 4 Digitalisation level of the Hungarian insurance companies

According to the results of the digitalisation survey conducted by the MNB in the domestic insurance sector, covering 90 per cent of the sector in terms of gross premium income, the level of digitalisation of domestic insurers can be considered medium. In the insurance sector, online access to products is available for many product lines. However, during 2021, progress was made in a number of dimensions measuring digital maturity: on the one hand, interaction with external partners became increasingly digital, and on the other hand, the digital competences of employees and the initiatives to systematically train them for long-term development were expanded. In addition, many insurers have made significant progress in digitalising their internal systems. Despite improvements in several areas, the overall commitment to digitalisation at organisational level still needs to be improved, and in terms of modernising internal operations, digitalisation and automation improvements related to specific workflows would be justified.

#### Chart 70





Note: The chart represents the minimum, the maximum, the lower and the upper quartiles, and the median values. Source: MNB.

# 4.1 DIGITALISATION OF DOMESTIC INSURANCE COMPANIES

The MNB has also conducted a survey on the level of digitalisation of domestic insurers for 2021. The digitalisation-focused questionnaire, consisting of 7 pillars with more than 250 questions, provides a comprehensive and up-to-date picture of the sector's readiness, engagement and level of digitalisation of insurance products and back-office processes. As in the previous year, the survey covered more than 90 per cent of the domestic insurance market based on gross premium income.

Overall, the digitalisation level of the Hungarian insurance companies is medium. The typical degree of digitalisation in the domestic insurance sector increased from 58 in 2020 to 62 in 2021 (on a standardised scale of 0 to 100)<sup>15</sup>. In many cases, domestic insurers have different approaches to selling key products and services (preferences between life and non-life products), and these differences are also noticeable in the context of digital transformation. Within each pillar, the level of digitalisation development measured by the MNB shows a mixed picture. On the whole, however, the level of digitalisation of a typical insurer's product range can be judged good and the relationship with external partners is increasingly shifting towards digital. However, the commitment of insurers to digitalisation at organisational level needs to be improved. Over the past year, the domestic insurers have made progress in the labour force pillar, so the competences needed for further digital development are increasingly present, as

<sup>15</sup> More detailed descriptions of the index calculation methodology can be found in Box 5 of the 2020 FinTech and Digitalisation Report and in the Annex to the 2021 FinTech and Digitalisation Report.



## Chart 71 Availability of digitally accessible insurance products

Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. During the mean calculation those institutions which are not selling that particular product were not considered. For some institutions, the possibility to apply for life insurance products online was available via pilot projects in 2020, but was no longer available in 2021, hence the decrease seen in Traditional Life and Unit-linked life and Pensions insurance products.

Source: MNB.

# Chart 72

#### The spread of tools to encourage the use of digital solutions



Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. For online advertising, the number of institutions answering yes did not change from 2020 to 2021, the decrease being caused by a technical factor, the change in market shares as a proportion of gross premium income.

Source: MNB.

are the initiatives to develop them systematically. Several insurance companies have made significant progress in the digitalisation of their internal systems, but there is still a need for modernisation of several system components, which can also support the development of the level of digitalisation of internal workflows, which is somewhat lagging behind (Chart 70).

# 4.2 DIGITALISATION OF INTERACTIONS WITH EXTERNAL STAKEHOLDERS

There has been no improvement in the digital accessibility of insurance products, with the online initiation of household property insurance still being the most common. The most commonly used non-life insurance products have been available online to the general public for some time now, making it possible to apply fully online at all institutions selling these products (Chart 71). Full digitalisation is still lacking for life and business insurance products, and no institutions have digitalised their application processes for these products. The situation is complicated by the fact that in the past year, liability and business insurances appeared in the offer of some institutions that did not previously sell them. However, none of these new products are offered in a digitalised application process, which has led to a slight deterioration in the average level of development of the sector.

Incentives to use digital solutions are widespread, but there is also a need to expand the functionality available to customers on digital platforms. All the institutions surveyed have a strategy to encourage customers to use digital solutions, and support this process in practice through a variety of means, mainly online advertising and newsletters. Incentivising the use of digital solutions is also becoming increasingly important in the pricing of products, and this tool is used by nearly three quarters of the sector in terms of gross premium income (Chart 72). In the future, it would also be important to create incentives at the points of contact for customers, thereby helping the insurance sector to ensure that customers are properly informed about the options available to them, both offline and online, and can conveniently manage their affairs according to their preferences. In addition, the expansion of the functionality of digital customer interfaces

Availability of certain administrative functions for existing customers on insurance companies' digital platforms



Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. Source: MNB

#### Chart 74 Form of regular customer notification of the premium due (non-life) or current balance (life)



Note: In proportion of respondents. During the mean calculation those institutions which are not selling that particular product were not considered. Source: MNB. is also a necessary development direction: customers can typically only use these solutions for information and query purposes, mainly through the customer portal. Mobile app accessibility is less available for certain administrative functions, as self-reported by insurers: balance enquiries are the most common, but even this is only available for 22 per cent of the sector in terms of gross premium income (Chart 73).

Customer notifications continue to be digitalised, mainly for retail property insurances, but the digitalisation of notifications related to corporate products has also started. Notifications of the due date of premium payment for retail non-life products are the most digitalised in the sector, but in general there has been no change in the availability of digital notifications for retail customers from 2020 to 2021. The digitalisation of balance notifications and premium payment information for life products as well as the migration of more general customer information and communication to electronic platforms, remains a necessary development direction. In the 2021 FinTech and Digitalisation Report, the MNB also stressed the need for a greater focus on the digitalisation of notifications for corporate products, and developments started on the insurance side, but still less than half of corporate customers receive digital notifications at 67 per cent of the insurers (Chart 74).

The digitalisation of cooperation with external and business partners can be considered advanced. On the whole, the domestic insurers are doing well in terms of overall contact and communication with regular business partners, with the latter having improved over the past year, with insurers preferring electronic communication channels with all business partners (Chart 75). The need for digitalisation improvements may be particularly relevant in the area of openness to innovative actors. Dedicated incubation programmes run by insurers are still absent from the domestic insurance market, although some institutions are now considering introducing them in the medium term, but no concrete initiatives are currently in sight. Somewhat similar to the results of last year's survey, a quarter of the surveyed institutions have established partnerships with innovators, but even these institutions are in partnership with only 4–5 innovators at most.

How typical is the use of electronic channels for occasional and regular contact with the different business partners



Note: In proportion of respondents. Institutions that are not affiliated with a particular partner were not included in the calculation. Source: MNB.

#### Chart 76

#### The relevance of user experience (UX) focused design and related methodologies in the domestic insurance sector



Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. Source: MNB.

## 4.3 PREPAREDNESS OF MANAGEMENT AND EMPLOYEES

Implementing the digital transformation is an important part of the insurance sector's strategic plans. The main strategic objectives for all insurers include driving forward the digital transformation of the institution, with an increasing focus on comprehensive, institution-wide digitalisation efforts. For 2021, 80 per cent of the surveyed insurers take a holistic view on digitalisation, not just a product- or process-specific one—an improvement of nearly 15 percentage points compared to last year. The cross-cutting nature of the modernisation objectives and ambitions is demonstrated by the fact that a significant majority of institutions has already integrated the application of UX principles and methodologies not only at operational level but also at strategic level (Chart 76).

In the insurance sector, there is still less commitment to digitalisation at strategic and management levels, but there is a growing focus on employee readiness. Many institutions still do not have an independent senior manager responsible for the digital transformation, and in many institutions this manager is not a member of the institution's board. However, in the existing areas of digitalisation in insurance, there was progress in both IT and non-IT staff numbers from 2020 to 2021. In the IT area, there was more of a catching-up, as the share of institutions with more than 21 such professionals did not increase-still around 40 per cent in terms of gross premium incomewhile the share of institutions with a 16 to 20-strong IT staff increased significantly to 33 per cent from 15 per cent. The number of non-IT (e.g. business) experts is still lower in many institutions, with a significant proportion of teams of less than 10 people. On the other hand, institutions with a high priority for digitalisation at the expert level saw a significant improvement in one year and the share of institutions with at least 21 non-IT experts in digitalisation has almost doubled (Chart 77).

Developing employee readiness to support organisational renewal is an increasingly important area. Training courses and further education on digitalisation were already typically available for insurance employees even earlier on. In addition, by the end of 2021, the frequency of training events increased significantly, with two thirds of the sector on a gross premium income basis delivering digitalisation training every six months. Besides, there are only a few institutions that do not offer digitalisation-oriented training courses either on a regular or ad hoc basis (Chart 78).

Distribution of the number of non-IT employees working in the digitalisation areas of institutions

Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. Source: MNB.

#### Chart 78 Frequency of digitalisation courses and training for employees



Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. Source: MNB At the same time, however, the assessment of the employees' digital literacy is still not generally exercised, and therefore it remains an area for substantial improvement. On a gross premium income basis, 39 per cent of the sector already assessed the digital skills of its staff in some form, but this percentage is almost the same as a year earlier, with only one small institution showing improvement.

# 4.4 DIGITALISATION OF INTERNAL OPERATIONS

There is a need to strengthen process automation and digitalisation improvements in the internal operation of insurers. The majority of domestic insurers have already implemented the digitalisation and automated notifications for the administrator and the customer in relation to the individual product application processes and the value chains within them (Chart 79). At the same time, there is still a need to improve the automation of information flows between various internal systems of the insurers. Among other things, there are a large number of manual processes in terms of communication with the general ledger or analytical system and data transfer to the data warehouse. On average, the level of automation of data retrieval from the data warehouse is considered to be good (3.84 on a scale of 1 to 5), based on self-reporting by the institutions. Innovative technologies can also contribute to the implementation of effective process management. A dedicated project has been launched in cooperation between the MNB and the insurers to explore the potential for the innovative use of blockchain technology, the results of which could soon be incorporated into the banks' and insurers' communication process (Box 8).

#### Chart 79 Existence of automated notifications for product application status changes



Note: The weighting was done in proportion to the gross premium income of the institutions surveyed. In the case of customer notifications, the range of institutions answering yes did not change from 2020 to 2021, the decrease was caused by a technical factor, the change in market shares as a proportion of gross premium income. Source: MNB.

#### Chart 80

Average data transfer speed among different internal IT systems at domestic insurance companies



Note: The weighting was done in proportion to the gross premiun income of the institutions surveyed. Source: MNB The level of development of the internal systems of insurers can be judged good, but further innovative system improvements are needed to increase the efficiency in the sector. Based on the institutions' self-assessment, the sector considers its hardware and software assets to be state-ofthe-art (4 being the typical score on a scale of 1 to 5). At the same time, the average data transfer rate between internal insurance systems exceeds 1000 MB per second for three quarters of the sector on a gross premium income basis (Chart 80). However, the wider use of cloud-based solutions may also be necessary to improve the communication between systems, data asset management and individual professional domains. Based on 2021 year-end data, 55 per cent of the institutions in the insurance sector as a whole and 67 per cent of the institutions surveyed in the MNB's digitalisation survey use cloud services, and these ratios are the same as at the end of 2020, a year earlier, so there was no significant progress in the sector in the past year.

## Box 8 Home insurance registration with DLT technology solution

The *Home Insurance Registration and Collateral Support with DLT* project aims to implement the support of business processes related to the registration of home insurances and their provision as collateral by means of a distributed ledger technology solution. By encouraging the use of modern technology, the MNB promotes fast and efficient communication between the bank and the insurer on this issue, with the enforcement of the digital and green aspects. The solution will be used by Hungarian insurers, credit institutions and the MNB.

The functional and non-functional requirements for the system have been defined in consultation with the sectors. Each insurer and the MNB will operate a node in the network; the credit institutions will access the system by connecting to the MNB node. The users of each participant will access the functions of the system mainly through the specialised business administration systems of insurance and credit institutions, through a single interface to be implemented. To implement this, the MNB has launched an EU open public procurement procedure under the title Home Insurance Register DLT, to support and catalyse the development of communication processes and IT innovation among financial sector participants.

The solution consists of a web-based business management system and a distributed blockchain database. The blockchain is implemented on the Hyperledger Fabric platform. The blockchains of the system are the same for each node. The business data managed in the system is stored encrypted in the blockchain. The data of a given business entity can only be unlocked by the insurer of that insurance policy and the credit institution associated with that clause, as the specific key required to do so is stored only on the infrastructure of those institutions. The system components are organised in a microservice application architecture on a containerised infrastructure.

The main business functionalities supported by the solution are summarised in Chart 81.



# John von Neumann

(28 December 1903 – 8 February 1957)

Mathematician, mathematician physicist, founding figure of computing, the brilliant researcher of set theory, game theory, operational research, quantum mechanics, atomic energy, and digital computer design. Former professor at the Institute for Advanced Study in Princeton, member of countless universities and academies of sciences, former president of the United States Atomic Energy Commission. Streets, schools, a university and even a crater at the Moon are named after him.

Neumann showed signs of genius in many areas even as a child, then he gained several awards as a student of the Budapest-Fasori Lutheran Secondary School. After graduation he was already considered a well-qualified mathematician, he enrolled in the mathematics major of the Budapest Science University, while also pursuing his studies at universities in Berlin and Zurich. After earning his doctorate, he gave lectures both in Europe and America, then he eventually settled down in the United States. He was involved in the research and the military use of atomic energy, then also in managing the development of peaceful energy production.

Between 1945 and 1957 he was the leader of the Electronic Computer Project in Princeton. He was working on the development of machines based on the functioning of the human brain and nervous system. In 1944, he took a key role in building the first fully electronic, digital computer, the ENIAC (Electronic Numerical Integrator and Computer) at the University of Pennsylvania.

In 1945, the first electronic, stored-program computer, the EDSAC (Electronic Delay Storage Automatic Calculator), was built at the University of Cambridge using the "von Neumann architecture". Neumann based the operation of the computer on biology: he developed the algorithm similarly to the pattern of problem-solving mechanism of the human brain and used it to perform calculations in the computer. In recognition of his merits, the President of the United States of America appointed him to the Commissioner of the American Atomic Energy Commission.

Neumann is one of the greatest scientists of the 20th century, who applied mathematics not in a self-serving way, but by reacting to the needs of the era, for the purpose of usability, while achieving incredible scientific results. We can be grateful for him for the most important principles of electronic computers, like the use of binary number system, the memory, the program storage, the use of algorithm, or the development of an instruction system.

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