FINTECH AND DIGITALISATION REPORT

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Without prejudice to its primary objective – to achieve and maintain price stability – the Magyar Nemzeti Bank supports the maintenance of the stability of the financial intermediary system, the enhancement of its resilience, its sustainable contribution to economic growth; furthermore, the MNB supports the economic and environmental sustainability policy of the government using the instruments at its disposal.

A high level of digitalisation and financial innovation contributes to achieving these goals. Therefore, the Magyar Nemzeti Bank considers it especially important to develop the digitalisation of the financial system and support the market introduction of innovative financial services in a secure manner.

The Magyar Nemzeti Bank 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 the underlying technologies, which are becoming increasingly dominant in the Hungarian financial markets. In this way, the Magyar Nemzeti Bank contributes to strengthening the digitalisation level of the domestic financial system, intending to actively support this trend in the future as well.

The analysis was carried out under the general guidance of Norbert Izer, Executive Director responsible for financial markets and digitalisation, in coordination with the Digitalisation Policy and Technology Department. In addition to the Digitalisation Policy and Technology Department, the following organisations participated in the preparation of the Report: the members of staff of the Insurance and Funds Supervision Directorate, the IT Supervision and Digital Supervisory Innovation Directorate, the Credit Institutions Supervision and Analysis Directorate, the Credit Institution Investigation and Consumer Protection Directorate, the Financial Infrastructures and Payments Directorate, the Directorate Financial System Analysis, and the Capital Markets and Market Supervision Directorate.

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

The projections in this Report are based on information available for the period ending 15 September 2025.

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Executive summary

For the sixth time, the MNB is publishing its FinTech and Digitalisation Report, presenting an annual review and analysis of international and Hungarian trends in the digital and innovative solutions that increasingly dominate the operation and development of the financial system, as well as in the underlying advanced technologies. As a result of technological developments and changing customer needs, digital solutions no longer play a supplementary role, but have become an integral part of the functioning of financial services. The MNB's goal is to promote the innovative, yet stable and secure operation of the financial sector through continuous monitoring and professional support, which creates long-term value for the economy and customers.

Similar to last year, this year's FinTech and Digitalisation Report focuses on six main areas. The first chapter provides an overview of international financial digitalisation trends and major global developments affecting the global FinTech sector. This is followed by international regulatory developments affecting the sector that may also be relevant for Hungary. The third part provides a comprehensive analysis of the Hungarian FinTech sector based on publicly available data. In the fourth and fifth chapters, we summarise the results of the digitalisation surveys recently conducted among Hungarian commercial banks and in the insurance sector. In the sixth and final chapter of the Report, we present, for the second time, the digitalisation development of the investment services sector and capital market participants.

In 2024, the digital transformation of the global financial sector continued to strengthen, driven primarily by artificial intelligence (AI) and FinTech innovations. A structural realignment can be observed in the FinTech ecosystem: while the number of market participants continued to grow, the volume of investments fell to a 7.5-year low. This development is the result of the high interest rate environment and more cautious investor behaviour. The strategic importance of digitalisation is demonstrated by the fact that the increasing integration of AI technologies not only increases the efficiency of operational processes, but also offers a competitive advantage to pioneering companies. The change is also noticeable in business models: more and more neobanks are already generating profits, but the majority of the sector continues to experience loss-making growth. In line with international trends, financial institutions in Hungary are undergoing comprehensive digital modernisation. Although the digital maturity of the domestic banking sector is considered average by international standards, the quality of certain basic services, such as account opening, is on par with that of leading international players.

The past year was an active period in the development of European Union financial regulations supporting technological development. Particular emphasis was placed on the responsible, secure EU-level regulation of artificial intelligence (AI) that respects the EU's fundamental values and rights. Several closely related guidelines were also published, laying the foundation for uniform implementation. The first provisions of the AI Act, which define the concept of AI systems and set out the requirements for AI proficiency, entered into force in February 2025. In the field of financial innovation, consumer credit regulations have been modernised due to the spread of "Buy Now, Pay Later" (BNPL) solutions, and European supervisory authorities have issued new guidelines to standardise the classification of crypto-assets.

After its previous expansion, the domestic FinTech sector showed signs of consolidation in 2024. The number of companies registered in Hungary fell to 210, and although the proportion of micro and small enterprises is declining, they still account for nearly 80 percent of players. The main areas of activity continue to be financial software development, data analysis and business intelligence, as well as payment services, which together account for about two-thirds of the companies. The number of employees decreased moderately, while net sales revenue continued to grow, approaching HUF 400 billion. The share of profitable companies rose to a small extent, indicating an appreciation of profitability. Exporting companies typically have higher revenues and are more profitable than their domestic-focused counterparts. In line with international trends, however, the number of venture capital transactions declined, which may slow down the expansion of companies in the sector. Companies that received capital in their first seven years grow faster in terms of workforce than those that did not receive financing, but the share of profitable companies among them is lower, as the emphasis is more on growth and the expansion of service exports.

According to the results of the MNB's digitalisation survey covering more than 90 percent of the domestic banking system in terms of balance sheet total, the digital maturity of domestic banks kept improving in 2024, continuing the upward trend from previous years and demonstrating that banks are committed to digitisation. Some institutions have already moved beyond the medium maturity range and entered a more advanced stage of digital transformation. It is also encouraging that institutions that were previously lagging behind have started to catch up, but the digital maturity gap between institutions still remains. Six of the seven pillars examined in the survey showed growth, with significant progress registered in some areas. In the field of customer communication digitisation, the increase in the share of electronic notifications related to credit debts represents a particularly important step forward. Shifting official customer communication to digital channels is beneficial in terms of both cost efficiency and customer experience. In addition, the rise of personalised communication, as an international trend, has also appeared in the Hungarian banking system, with the targeted use of customer data playing a key role in this regard. Progress has also been made in the digitisation of products, as evidenced by the increase in revenues from digital sales, as well as the fact that banks' products are increasingly available online and customers have also become more open to this type of transaction. Although the development of the digitisation of internal processes and workplace culture has not been outstanding, it is nevertheless an important achievement that the digitisation of internal systems – such as automatically updated records and employee training related to artificial intelligence (AI) and automation – is becoming increasingly important. The integration of AI is becoming a more and more important priority in the domestic banking sector, although the level of practical application varies from institution to institution, but the trend is clear: AI is gradually becoming a key pillar of digital transformation. However, the upward trend in management commitment to digitalisation was interrupted, as a decline in scores was observed, which was justified by increasing survey expectations related to artificial intelligence.

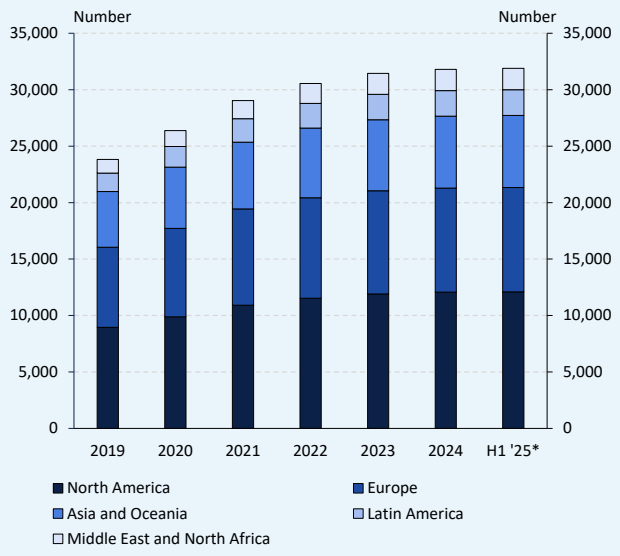
Based on the results of a digitalisation survey conducted in the Hungarian insurance sector, the level of digitalisation among domestic insurers has improved moderately in recent years. The digital maturity composite index for this sector improved minimally, suggesting that development opportunities were limited amid higher digitalisation expectations and rising cost burdens. Directly accessible insurance products are widely available online, but the level of digital intermediary sales still falls short of expectations. The range of customer portals and mobile applications is expanding at a slow pace, and although progress has been made in the area of payment functions, the share of insurers with mobile applications still remains low. Most institutions already have a medium-term digitalisation strategy, which is reviewed regularly, but dedicated senior management responsibility for digitalisation is still not widespread. Half of the insurers have already developed a dedicated AI strategy, and the use of AI has appeared at both the strategic and operational levels, but only a small number of dedicated AI teams or coordinating bodies are in operation. In terms of hardware assets, there is a moderate deficit compared to the current expectations, but in terms of software solutions, there are significant shortfalls.

The MNB's digitalisation survey covered the investment services sector for the second time. According to the results of the digitalisation survey covering nearly 85 percent of Hungarian investment service providers based on client assets, the digital maturity of domestic household investment service providers has improved to a moderate extent. The market continues to be structured by the difference between participants with a banking and non-banking background, with banks' economies of scale and existing infrastructure giving them an advantage regarding organisational and operational developments. Customer preferences have not changed significantly, with nearly one-half of users preferring digital channels, but face-to-face meetings are still significant, and e-mail remains the dominant form of communication. All service providers have customer portals and mobile applications, but functionality varies greatly: access to basic products and trading is common, but more advanced investor decision support tools are still typically absent. Moderate progress has been made at the internal system level, with advances in the automation of data transfer and data retrieval and the digitisation of product value chains, particularly in securities and TBSZ processes, but electronic management approvals and integrated customer data management are not yet commonplace.

1. International developments

In 2025 H1, digital transformation continued in the global financial sector, mainly driven by artificial intelligence (AI) and FinTech solutions. The FinTech ecosystem is undergoing structural transformation: while the number of companies has continued to grow, investment volumes have fallen to their lowest level in more than seven years, as a combined result of the high interest rate environment and elevated investor caution. Artificial intelligence is becoming increasingly integrated into financial services: AI-based technologies not only optimise operational processes, they also provide a strategic advantage for innovative players. The impact of digital transformation is also evident in business models: in addition to an increase in the number of customers, more and more neobanks are generating a profit. The development of digital financial services has also entailed a number of new, open banking-type technological solutions, which traditional banks are incorporating into their own operations as well. Although, in line with international trends, domestic financial institutions are undergoing a comprehensive digital transformation, the digital maturity of the Hungarian banking sector can be considered average in international terms, but it is competitive with international champions in certain basic services, such as account opening. The greatest potential for development can be identified in the digitisation of investment and insurance services and the expansion of customer service. Stable crypto-assets also play a major role in the digitisation of the financial sector, as they can serve as a bridge between the traditional financial world and crypto-assets. The US dollar (USD) continues to dominate as the reference currency for stablecoins.

Chart 1
Number of FinTech companies by region



*Note: *Based on data received up to 30 June 2025.*
Source: CrunchBase, Statista

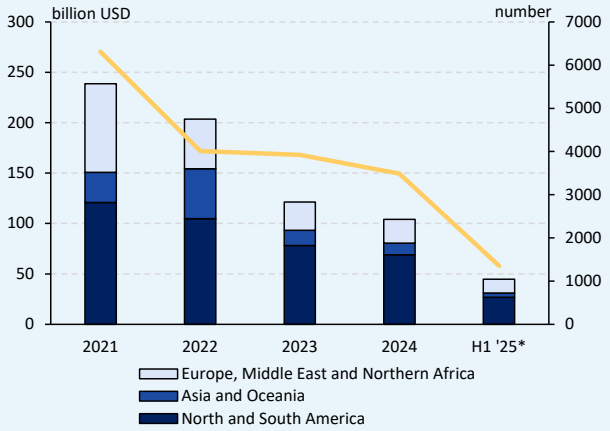
1.1. GLOBAL FINTECH ECOSYSTEM

In terms of the number of companies, North America continued to dominate the global FinTech ecosystem in 2025 H1. There were more than 12,000 financial technology companies operating on the continent, showing moderate, slowing growth compared to 2024. Europe maintained its position as the second largest FinTech hub with more than 9,200 companies, while the Asia-Pacific region was home to approximately 6,400 FinTech companies (Chart 1). Although the sector has experienced continuous growth over the past 15 years, the pace of new FinTech companies entering the market slowed significantly after 2021. In the previous year, the United States continued to have the highest number of FinTech unicorns, hosting nearly five times as many companies valued at USD 1 billion as the United Kingdom, which ranked second.[1]

The slowdown in FinTech investment has persisted for the fifth year in a row, with the total investment volume hitting a 7-year low of USD 101 billion in 2024. Interest rate hikes since 2022 have increased financing costs and reduced valuations. With investment declining, FinTech companies have focused on operational efficiency and cost optimisation to improve profitability. Although the total value of investments declined in 2025 H1 compared to 2024 H1 (USD 51.7 billion), investor sentiment improved significantly, particularly among mature companies, which

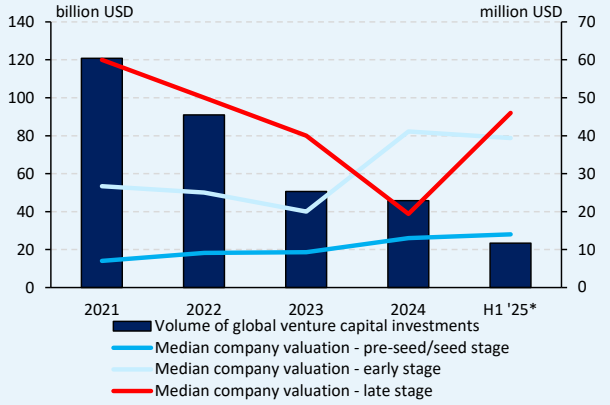
[1] CB Insights (2024): State of FinTech Report.

Chart 2
FinTech investment volume by region (left axis) and total number of deals (right axis)



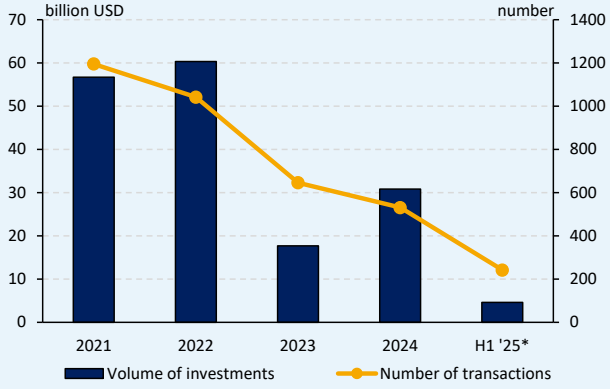
*Note: *Based on data received up to 30 June 2025.*
Source: KPMG (2025): Pulse of Fintech H1'25

Chart 3
FinTech venture capital investment volume (left axis) and valuation of selected FinTech companies (right axis)



*Note: *Based on data received up to 30 June 2025.*
Source: KPMG (2025): Pulse of Fintech H1'25

Chart 4
Volume of investment in payment technologies (left axis) and number of transactions (right axis)



*Note: *Based on data received up to 30 June 2025.*
Source: KPMG (2025): Pulse of Fintech H1'25

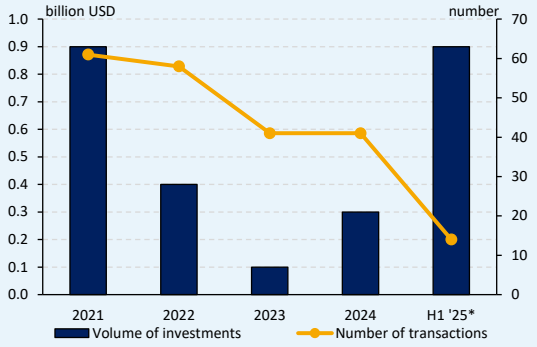
could lead to a positive outlook for 2025 H2 (Chart 2). The most significant decline occurred in the Europe, Middle East and Africa region, where the investment volume dropped to one-half of the levels in previous half-years.

Venture capital investments also slowed in line with global trends, but the rate of decline seen in recent years has eased. At the same time, there was a significant increase in late-stage venture capital and in the pre-investment valuation of growth-stage companies, which may be related to investors' declining risk appetite, as a result of which they have become more open to companies with higher profitability and proven business models (albeit fewer in number). This trend may indicate saturation in the sector and a transition towards companies with more scalable, predictable exit strategies (Chart 3).

Investor activity in 2024 and 2025 H1 focused primarily on artificial intelligence (AI)-based services, digital payments, and strategic acquisitions. Although digital payments remain the FinTech segment with the largest investment volume, the total value of investments had declined significantly by 2025 H1. Although the 2024 data gave cause for optimism, investors invested only USD 4.6 billion in the sector in 2025 H1, the lowest level observed in over a decade (Chart 4). The decline in investment volume may not necessarily reflect capital turning away from the sector altogether, but may rather indicate a strategic shift, as investors are gradually moving towards sustainable, scalable business models. With a focus on predictability, investors are turning away from speculative FinTech models aimed at increasing customer numbers and instead are looking for innovative, value-creating companies. In line with general trends in the FinTech sector, AI played a particularly prominent role for investors in the payments sector in 2025. Significant attention was paid to the potential applications of AI, for example in the area of fraud detection in payment activities, the optimisation of liquidity management for more efficient working capital management, and the support of personalised customer experiences and customer-centric service development.

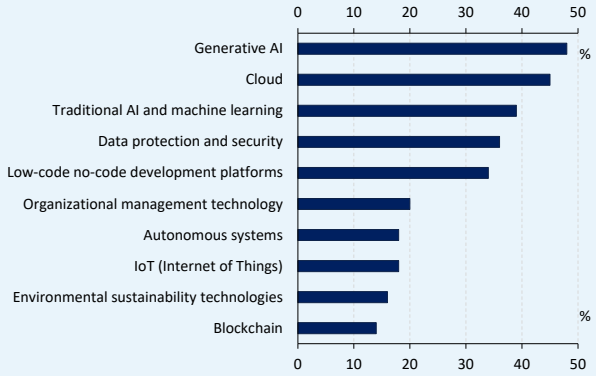
At the same time, economic and political uncertainties and regulatory changes have shifted the focus towards profitable FinTech companies with stable fundamentals, particularly in the area of WealthTech solutions.

Chart 5
Volume of investment in WealthTech companies (left axis) and number of transactions (right axis)



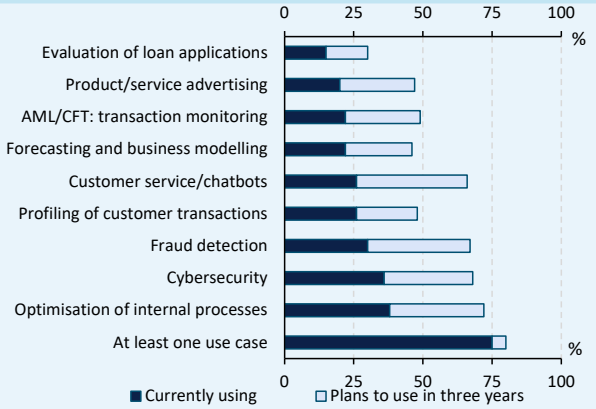
Note: Based on data received up to 30 June 2025.
Source: KPMG (2025): Pulse of Fintech H1'25

Chart 6
Top technologies for growth according to banking executives



Source: Gartner (2024): How Bank CIOs Can Help Drive Business Growth

Chart 7
Artificial intelligence use cases currently and three years from now



Note: 118 institutions participated in the 2024 survey: local and international credit institutions, as well as insurers and capital market players.
Source: Bank of England (2024): Artificial intelligence in UK financial services

In contrast to investment in the area of payment services, this sector embarked on a growth path, in 2025 H1, investment volume nearly tripled (Chart 5). The increase in investment was driven by a small number of high-amount transactions, including several acquisitions related to robo-advisory services. In addition to investment activity, the spread of AI technologies has prompted many financial institutions to focus on internal development, aided by low-code/no-code and other AI solutions. With the help of these, even institutions with a lower technological background can offer innovative services and exercise greater security with their data.

1.2. ARTIFICIAL INTELLIGENCE IN THE FINANCIAL SECTOR

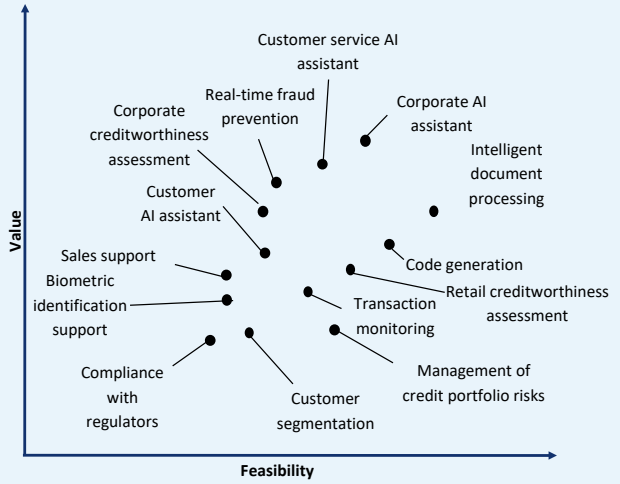
The intensive use of AI may trigger a shift from the concept of digital banks to so-called smart banks. Since players in the sector handle a vast amount of data in their operations, and many of their processes can be automated, it is not surprising that this sector is one of the most exposed to AI.[2] Following growing investments in this area by global technology companies and the debut of large language models (LLMs), the technology is receiving increased attention (Chart 6), and the future may belong to agent artificial intelligence. This technology is capable of making decisions autonomously, without human intervention, and may therefore also be used to automate more complex banking tasks, for example.

The presence of AI in the financial sector is already noteworthy, but there are still many untapped areas for the technology. The Bank of England's 2024 survey,[3] for example, identified 70 use cases for the sector, and although three-quarters of the institutions surveyed used AI, 55 percent of these institutions used the technology in fewer than ten use cases. It is also characteristic that AI adoption is currently dominant in IT and operational areas. In order for players in the sector to exploit the potential of the technology, AI must also feature prominently in classic business functions. Currently, cybersecurity, customer support, and internal operations automation are areas where at least one-quarter of the financial institutions surveyed already use AI-based solutions, but the number of these areas is expected to grow in the coming years (Chart 7).

[2] OECD (2024): A sectoral taxonomy of AI intensity

[3] Following on from 2019 and 2022, the Bank of England conducted another joint survey with the FCA in 2024 on the use of artificial intelligence in the financial sector. For more information, see: Bank of England (2024): Artificial intelligence in UK financial services

Chart 8
Potential artificial intelligence use cases in banking by feasibility and value creation



Source: Gartner (2024): Generative AI Use-Case Comparison for Banking

Chart 9
What benefits are already visible from the use of artificial intelligence?

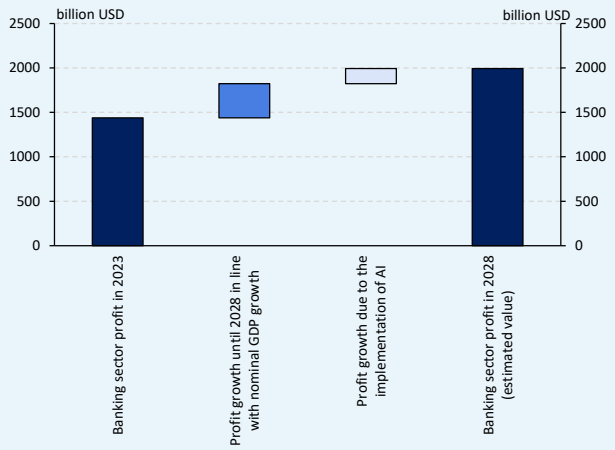
Source: KPMG (2025): Intelligent banking

In order for organisations to decide to use AI for individual processes, conscious and strategically sound decisions are needed. Financial sector players need to consider a number of factors in order to chart their own development path to making AI an internal resource. One important step is to ensure the availability of data assets of sufficient quantity and quality and to redesign individual work processes; however, it is also essential for the organisation to be well-prepared, which includes, for example, having the right expertise, management responsible for technology and a comprehensive AI strategy, whether it involves procurement or in-house development. When developing AI, it is worth starting with use cases that are low-risk, offer a solution to an internal problem, are easier to implement, and can therefore quickly and easily provide a sense of achievement, helping to boost organisational engagement (Chart 8).

The sector is already spending significant amounts on technology, which indicates its commitment to AI. The banking sector's spending on artificial intelligence exceeded USD 30 billion in 2024, representing an increase of approximately 50 percent compared to 2023.[4] However, the sector is not uniform in terms of the intensity with which individual players are turning to technology, and it is easy to imagine that more agile players could gain an advantage. The situation is further complicated by the specific market conditions of the AI value chain: the development and operation of the cloud and hardware infrastructure required for the systems to function is costly, which may be a "more favourable" situation for larger institutions. Although there is currently greater competition in the market for large language models (LLMs) and technology-based application development, large technology companies are striving to offer solutions for the entire value chain. Financial institutions should remain flexible and further expand in a model-neutral way so that they have access only to functions valuable for them, always at competitive prices, in a personalised manner.[5]

[4] Statista (2024): Estimated value of the banking sector's artificial intelligence (AI) and generative artificial intelligence (gen AI) spending worldwide in 2023 and 2024, with forecasts until 2028.
[5] BIS (2024): The AI supply chain.

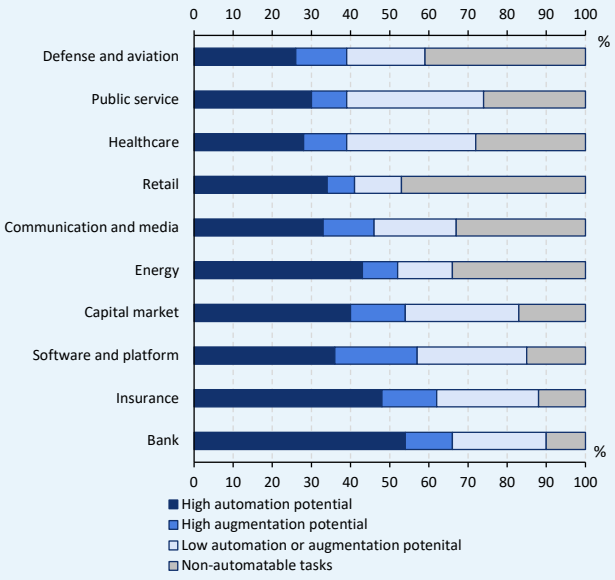
Chart 10
The impact of AI implementation on global banking profits in 2028



Note: The estimate of profit growth due to AI adoption is based on estimates from banks, insurance companies, and capital market participants.

Source: CITI (2025): AI in Finance

Chart 11
Distribution of working time in select industries, according to the potential impact of artificial intelligence



Note: Based on calculations by Accenture Research and the World Economic Forum.

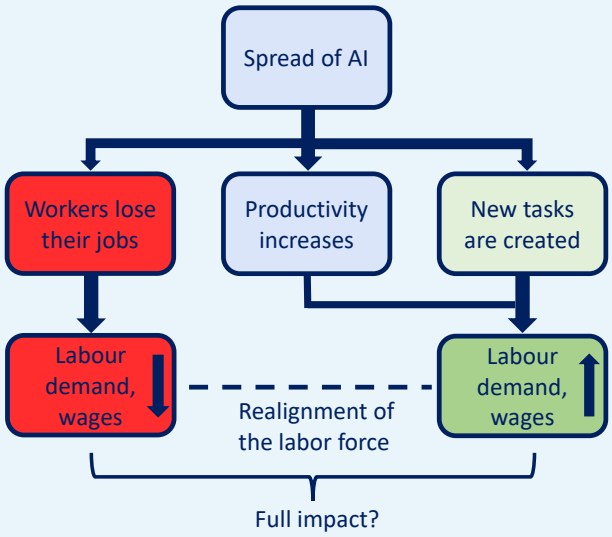
Source: CITI (2025): AI in Finance

Initial financial results are already visible, but AI could lead to more significant profit growth for the banking sector in the coming years. According to a survey, 35 percent of players in the sector were able to reduce their costs by implementing AI, but at least one-quarter of banks also reported more efficient operations, increased turnover or improved customer experience (Chart 9). The diversity of the positive effects experienced also indicates the potential inherent in the technology. According to expert estimates, the use of AI could increase the banking sector's profits by 9 percentage points by 2028 (Chart 10), representing a significant surplus for the sector. However, not all players benefit equally from the advantages of AI. Currently, large global banks registered in the United States are leading the way in the use of this technology: according to a report examining the AI capabilities of global banks,[6] seven of the ten best-performing institutions are based in the US.

AI offers large-scale automation opportunities, the initial effects of which are already being felt in the financial sector. According to some estimates,[7] employees in the banking sector are most exposed to artificial intelligence, but the insurance and capital market sectors are not far behind (Chart 11). Nevertheless, the unemployment rate in the jobs most exposed to AI[8] is not yet higher than the economic average. Although layoffs continue to be part of the sector's operations, the major players tend to attribute the layoffs to poor performance indicators and redundancy of positions rather than technological change.[9] Artificial intelligence has had a greater impact on jobs related to outsourced tasks[10] and entry-level positions. However, one estimate suggests that this may change in the future: the technology could replace up to 200,000 jobs in the banking sector over the next three to five years.[11]

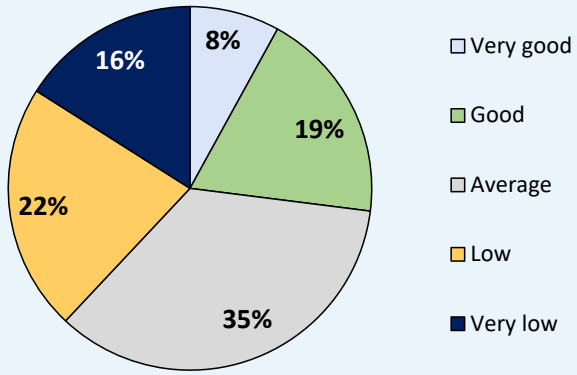
[6] During the assessment, banks were scored in the categories of talent, leadership, innovation and transparency. For more information, see: Evident (2024) Evident AI Index.
[7] *CITI (2025): AI in Finance.*
[8] Goldman Sachs (2024): Gen AI: too much spend, too little benefit?
[9] Yahoo Finance (2025): Wall Street is starting to trim jobs as economic uncertainties mount.
[10] BBC (2025): Major Asia bank to cut 4,000 roles as AI replaces humans.
[11] Bloomberg (2025): Wall Street Expected Job Losses May Top 200,000 as AI Replaces Roles.

Chart 12
Impact of artificial intelligence on the labour market



Source: BIS (2024): Annual Economic Report

Chart 13
Financial sector employees' AI knowledge according to their own self-assessment



Note: The survey was conducted by questioning approximately 200 employees of the Australian financial sector.

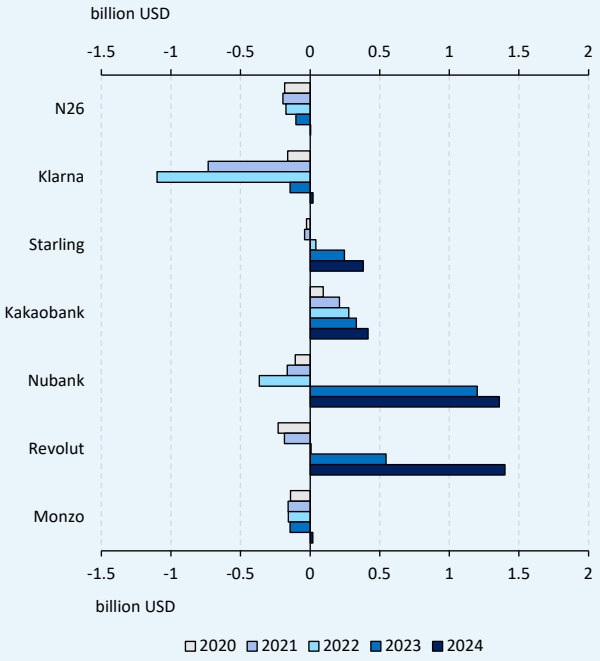
Source: Financial Sector Union (2025): AI in the finance sector The worker perspective

The increase in productivity due to AI and the creation of new jobs may mitigate the effects on the sector's labour market (Chart 12). Historically, innovations appearing in the financial sector have not necessarily resulted in mass lay-offs. For example, following the introduction of ATMs, the number of bank branch employees increased for decades, as employees were assigned new tasks instead of handling cash. A similar scenario is easily conceivable if, for example, the spread of digital banking leads to more complex banking advisory processes becoming the focus of branches. In fact, there are segments of the labour market where demand is growing as a result of interest in AI:[12] in the US, for example, financial analysts with AI skills can earn one-third more than their colleagues without these skills.

It is worthwhile to provide employees at all levels of the organisation with AI tools and the training necessary to use them. The use of this technology may streamline work processes, and with new skills employees may also perform tasks with higher added value. Ever-evolving customer demands will increasingly require real-time, personalised service delivery, which can only be achieved with the support of AI. From this point of view, however, employees in the sector are not yet fully prepared for the future, as a significant proportion of them have poor AI skills (Chart 13), which underscores the importance of training the existing workforce for institutions. In addition, it is clear from the employees' point of view that even if AI does not directly threaten their jobs, if they are left out of the use of artificial intelligence, it may affect their career prospects both within the institution and more broadly.

[12] PwC (2025): AI jobs barometer.

Chart 14
Profitability of the most popular neobanks



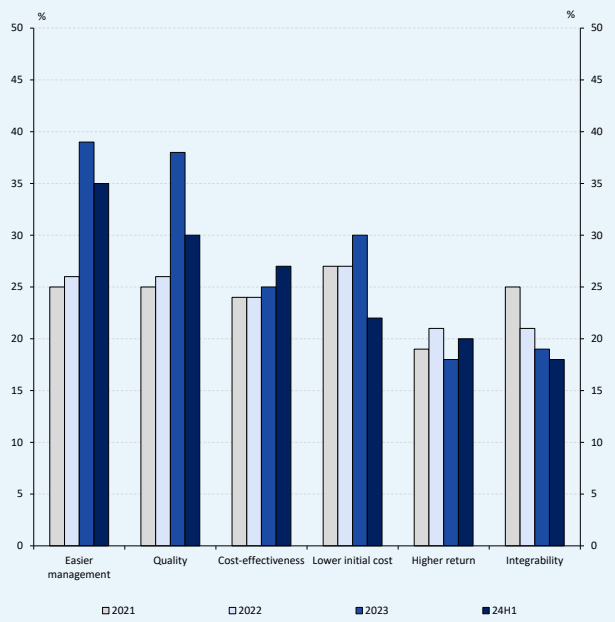
Source: Based on public reports, edited by the MNB

1.3. PROFITABILITY AT NEOBANKS

While some of the largest neobanks previously operated at a significant loss, an increasing number of non-traditional financial institutions are now reporting profits as their customer base grows (Chart 14). Although all neobanks stand to benefit from the rapid spread of digitalisation and shifting customer preferences, not all financial institutions are able to post a profit. This is best explained by the operating model of FinTech companies: they focus predominantly on low costs, technological innovation and personalised services, with the primary goal of increasing their customer base as quickly and as much as possible, even at the expense of profitability. Once they have reached the right number of customers, these dynamically growing companies also become financially sustainable, by expanding their toolkit and changing their pricing. While neobanks that adapt more quickly to the market were able to become profitable sooner, others continue to rely on capital injections to maintain their operations in the absence of positive operating income. As competition intensifies, increasing customer loyalty and cost management efficiency will also become key, especially in a rising interest rate environment. However, the overall picture is still mixed: while 95 percent of US banks are profitable year after year, less than half of FinTech banks were profitable in 2023. Looking at the global FinTech market as a whole, just over 5 percent of FinTech financial institutions are profitable, with a significant proportion of successful companies coming from Asia. In many cases, however, the lack of profitability is not due to a lack of revenue growth, but rather to inadequate cost optimisation. According to Simon-Kucher's profitability matrix,[13] only six of the 33 leading neobanks and financial service providers were able to achieve sustainable growth (i.e. the ones that were able to achieve positive results while continuously increasing their customer base). However, the proportion of profitable neobanks is gradually increasing, which is intensifying competition between traditional banks and neobanks. By diversifying their revenue sources and increasing profits, neobanks can remain viable in the long term, which may also accelerate the digital transformation of traditional banks.

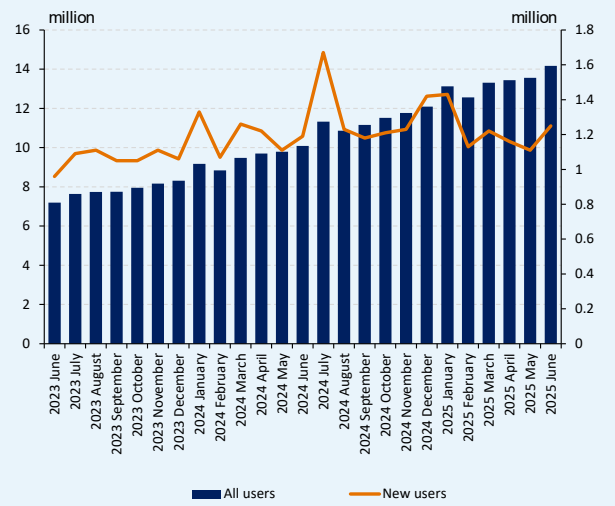
[13] Simon-Kucher (2023): Profits at the End of the Tunnel – Neobanking.

Chart 15
Changes in FinTech usage preferences among US small and medium-sized businesses



Source: RFI Global (2025): The evolution of business banking: Fintech or high street – a personal experience

Chart 16
Total existing (left axis) and new (right axis) open banking users in the United Kingdom



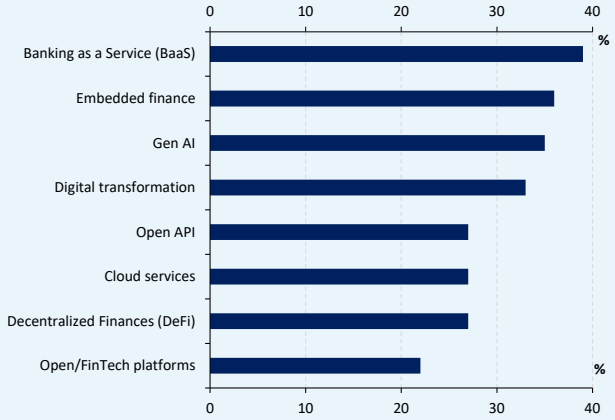
Source: OBL Impact Report (2025)

In recent years, there has been a growing trend among small and medium-sized enterprises to shift their preferences from cost reduction to a more convenient, higher-quality user experience. Whereas a few years ago, the primary reasons for SMEs to use FinTech services were lower initial costs, cost efficiency, and higher returns, from 2023 onwards, respondents preferred quality and easier usability (Chart 15). This clearly indicates a change in expectations towards FinTech services. This trend is also reinforced by the acceleration of digital transformation: artificial intelligence-supported systems, the development of applications and process automation all contribute to making FinTech solutions not only cheaper, but also more efficient and convenient than traditional banking services. Small and medium-sized enterprises also rated integrability as particularly important, with the easier interconnection of different FinTech services becoming increasingly important in the market. The central role of user experience is expected to grow even stronger in the coming years; accordingly, companies seeking profitable growth will need to strike a balance between cost efficiency, innovation and outstanding customer experience.

1.4. EMERGING FINANCIAL INNOVATIONS

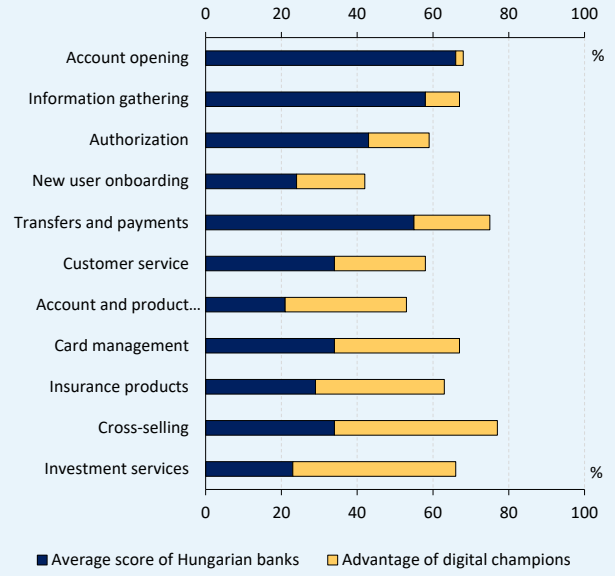
The development of digital financial services has brought with it several new technological solutions, such as open banking, Banking as a Service (BaaS) and embedded finance. In 2025, open banking services were used by 18.4 percent of people and small businesses in the United Kingdom with online access to their current accounts, or one in five users (Chart 16). There are several factors behind this growth, as time savings, seamless payments, and easier tracking of transactions between accounts have all contributed to the increasing popularity of open banking. The BaaS model allows third parties (FinTech companies, e-commerce platforms or large corporations) to offer their own branded banking services (payment services, bank accounts, loans, credit cards) to their customers on their own platforms through API integration without obtaining a banking license or building their own banking infrastructure.

Chart 17
Technologies applied and developed by financial institutions in the last twelve months



Source: FINASTRA (2025): Financial Services State of the Nation Survey

Chart 18
Average digital score of Hungarian banks in each area and the advantage of digital champions



Note: Institutions in the top 10 percent based on the maturity index can be considered digital champions.
Source: Deloitte (2024): Digital Banking Maturity

By contrast, embedded finance allows businesses to integrate financial services into their own platforms without having to become traditional banking institutions. Its widespread adoption is driven by changing consumer demands, the rise of API-based integrations and the market coverage of large technology companies.

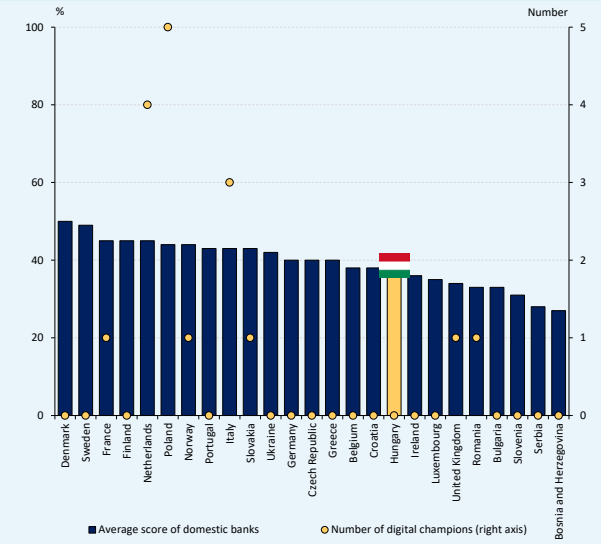
The international BaaS market is showing dynamic growth, with forecasts predicting that the market size could reach USD 85.73 billion by 2032.[14] This growth is supported by the fact that a large proportion of global financial institutions are applying or implementing developments in this area (Chart 17). In addition, embedded insurance, banking services, and lending are also gaining ground, especially "Buy Now, Pay Later" (BNPL) solutions. The value of transactions conducted using the latter solution is projected to reach USD 560 billion by the end of 2025.[15]

1.5. DIGITAL MATURITY OF HUNGARIAN BANKS AT THE INTERNATIONAL LEVEL

Hungarian financial institutions are moderately digitised in an international comparison. According to a Deloitte survey, Hungary ranks 17th among European countries in terms of digital maturity in the banking sector (Chart 18). Poland has the most so-called digital champions, i.e. those in the top 10 percent, while none were identified in Hungary. With regard to methodology, it is worth noting that, unlike the methodology of the MNB's digital development index, the consulting firm's survey examines the number of available functions; therefore, banks with more extensive functionality, i.e. those covering a wider range of administrative tasks digitally, rank higher.

[14] SNS Insider (2023): Banking As a Service.
[15] FinTech Futures (2025): Buy Now Pay Later Global Business Report 2025.

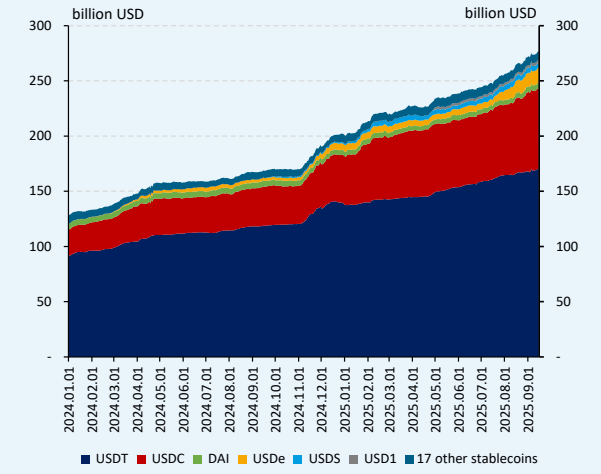
Chart 19
Scores for European countries based on Deloitte Digital Banking Maturity Index (left axis) and number of digital champions per country (right axis)



Note: Institutions in the top 10 percent based on the maturity index can be considered digital champions.

Source: Deloitte (2024): Digital Banking Maturity

Chart 20
Supply of key stablecoins



Note: Due to the different methodologies of the individual data providers, the market capitalisation or supply of stablecoins may differ in the individual charts, but this has no material impact on the substantive findings.

Source: Defi Llama, The Block

In terms of functionality, Hungarian banks lag behind most in the areas of investment services and digital cross-selling. Large banks in Hungary rank above the global average in several areas: for example, they perform better in information gathering and account opening (in the latter case, they are close to the average score of international digital champions), while they perform close to average in new customer onboarding and everyday banking (Chart 19). Domestic financial institutions lag behind most in areas beyond basic banking functions (insurance and investment services) and in account closure. However, it is encouraging that, compared to the latest survey, the strongest progress has been made by Hungarian institutions in the area of digital functions related to insurance products and cross-selling.

1.6. STABLECOINS REACHED A PEAK

Stablecoins, or stable crypto-assets,[16] have become a key element of the digital financial infrastructure. The stablecoin market experienced explosive growth between 2024 and 15 September 2025. By the end of the examined period, the total supply exceeded USD 276 billion (Chart 20). However, it is also worth noting that the market capitalisation of stablecoins is a fraction of that of Bitcoin (BTC) or Ether (ETH).[17] The total value of monthly stablecoin transactions more than doubled during the examined period, from USD 1.6 trillion to USD 4.4 trillion.[18] The number of addresses/wallets actively using stablecoins increased from 19.2 million during the period to 44.9 million in August 2025 and then declined to 34.2 million. [19] This growth makes it clear that stablecoins are becoming increasingly important in the crypto ecosystem, especially in the area of decentralised finance (DeFi).

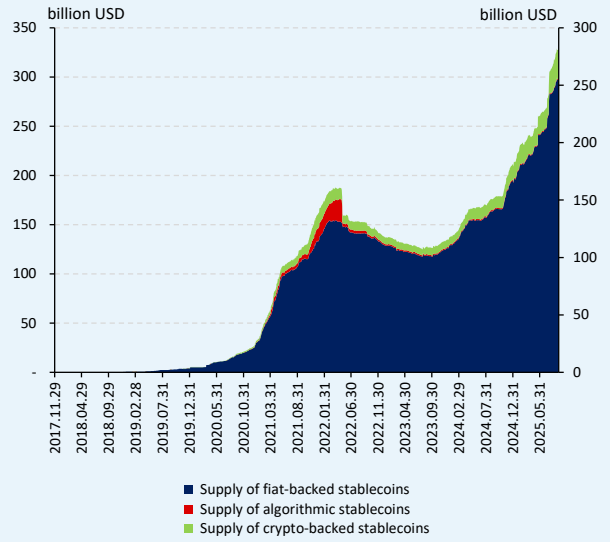
[16] Digital units of value that rely on stabilisation tools and mechanisms to minimise fluctuations in their value expressed in a reference currency (e.g. USD, EUR, any basket, mathematical variable). Bullmann, D.– Klemm, J. – Pinna, A. (2019): In search for stability in crypto-assets: are stablecoins the solution? ECB Occasional Paper No. 230. https://www.ecb.europa.eu/pub/ pdf/scpops/ecb. op230~d57946be3b.en.pdf. Moin, A. et al (2019): A Classification Framework for Stablecoin Designs. https://arxiv.org/abs/1910.10098.

[17] It did not exceed 11 percent of the combined market capitalisation of BTC and ETH. Sentora Research (2025): Stablecoins Insights dashboard. https://sentora.com/research/dashboards/stablecoins-insights.

[18] The highest value was measured in December 2024, when monthly transactions exceeded USD 5 trillion. This was followed by a moderate decline in January and February 2025. Over the past year, the value of stablecoin transactions amounted to more than USD 35 trillion.

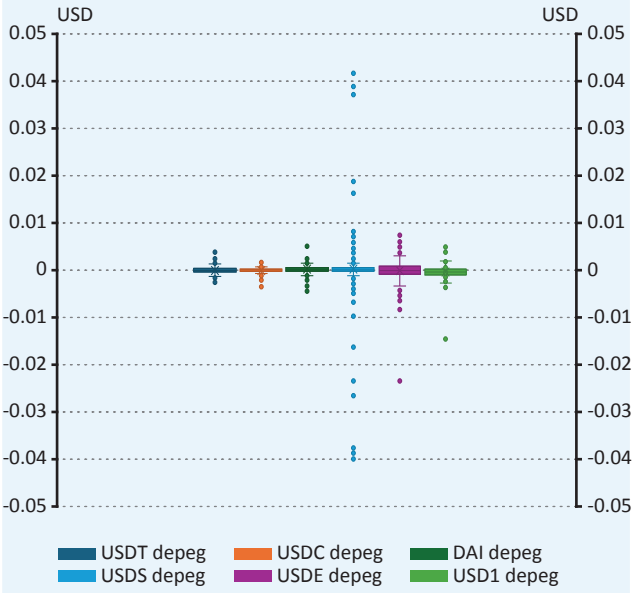
[19] Artemis – Dune (2025): The State of Stablecoins 2025: Supply, Adoption & Market Trends. https://dune.com/stablecoin-download; Artemis Terminal (2025): Stablecoin Usage by Chain. https://app.artemisanalytics.com/stablecoins?tab=chains.

Chart 21
Capitalisation of stablecoins tracked by DeFi Llama by collateral type



Source: DeFi Llama

Chart 22
Deviation of the top five stablecoins from their peg



Note: The MNB examined deviations from the reference rate between 1 January 2024 and 15 September 2025.

Source: Coingecko, DeFi Llama

The US dollar (USD) continues to dominate as the reference currency for stable crypto-assets. Based on market data, there is essentially no alternative to the USD, as market participants continue to consider it the most valuable or secure asset and wish to *peg* their exchange rates to it. Other reference assets include other official currencies (e.g. EUR,[20] CHF, GBP) and commodity exchange products (e.g. gold),[21] but the market capitalisation of such stable crypto-assets is negligible.

Users demand stablecoins that are (at least) fully backed by liquid assets.[22] 91 percent of the stablecoin supply is backed by highly liquid assets (fiat money or short-term government securities), indicating that users trust fully backed initiative.[23] The remainder of the stablecoin supply consists mainly of stablecoins overcollateralised with crypto-assets (e.g. ETH or staked[24] crypto-assets). Their supply increased moderately during the period under review, suggesting that their acceptance has grown. However, the market share of stablecoins with stabilisation mechanisms and supply managed exclusively by algorithms continued to decline. Past failures (e.g. TerraUSD, USDR) have shaken confidence in uncollateralised or only partially collateralised models (Chart 21).

The most important stablecoins provide the stability expected by users. The major stablecoins pegged to USD were able to maintain their peg and their exchange rates fluctuated only minimally (*depeg*) around the value of USD 1 during the reference period. It can also be observed that centralised stablecoins performed better than decentralised initiatives, as the former had lower volatility (Chart 22).[25]

[20] The capitalisation of stablecoins pegged to the EUR fluctuated between USD 290 and 350 million during the examined period.

[21] In the case of stablecoins pegged to a reference asset other than fiat money, such as BTC, the question arises as to how stable their value expressed in the reference asset is. On the other hand, such instruments may qualify as financial instruments in certain cases.

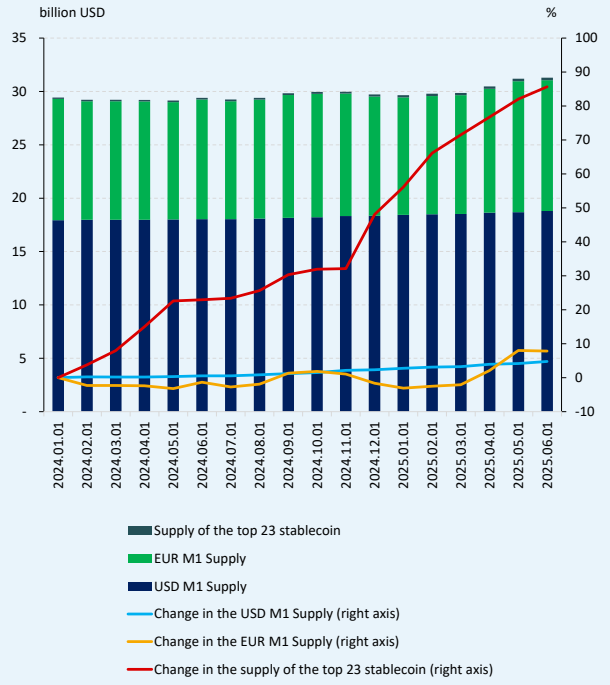
[22] At the time of writing, DeFi Llama listed 84 fiat money-backed, 168 crypto-asset backed, and 27 algorithmic stablecoin initiatives.

[23] This trend is reinforced by the strict requirements of certain stablecoin regulations (e.g. MiCA, GENIUS Act). The reserve assets of the most important stablecoin initiatives are primarily the US dollar, short-term US Treasury bills and government securities.

[24] The essence of staking is that users lock up certain crypto-assets in exchange for periodic rewards.

[25] Based on the annualised standard deviation of daily returns, it can be concluded that the volatility of the stablecoins examined is well below that of BTC or ETH.
For detailed methodology, see: Bullmann, D. et al.: In search for stability in crypto-assets: are stablecoins the solution? (2019)

Chart 23
Comparison of the supply and change of the 23 most important stablecoins with the supply and change of the USD and EUR M1



Note: The January 2024 value was used as the base for the change.
Source: ECB, Fed, The Block

Due to the above characteristics, stablecoins can serve as a bridge between the traditional financial world and crypto-assets. Stablecoins offer stable preservation of the value of returns from crypto-asset investments without the value leaving the crypto world, thereby reducing transaction costs. In addition, the vast majority of users can evaluate exchange rates (e.g. the BTC exchange rate) in official currencies (e.g. USD), and stablecoins allow users to quickly perform this evaluation in the crypto world as well. Furthermore, stablecoins are increasingly being used for everyday payments and P2P transfers. Fast, efficient stablecoin payments, which often have lower fees than traditional banking systems, can be attractive to users, and P2P transactions offer a simple and secure way to exchange value without intermediaries.[26] Finally, stablecoins are also of fundamental importance in the field of DeFi, as transactions are often carried out in such instruments and yields can also be realised in such. It is also undeniable that, if they reach a certain size, individual stablecoins and their issuers may pose risks to financial stability, and shocks may spill over into the traditional financial system, or vice versa.[27]

Institutional investors also wish to take advantage of the benefits of stablecoins. More and more institutions, including asset managers and financial institutions, are discovering stablecoins for liquidity management and settlement purposes, or see them as an opportunity to enter the crypto world. In fact, some countries are already exploring the possibility of issuing their own stablecoins.[28]

It cannot be ruled out that stablecoins will become competitors to traditional fiat currencies, due to the value propositions described above. The supply of stablecoins is still a fraction of the traditional fiat money supply (for example, about 100 times smaller than US M1). However, it is clear that the supply of the most important stablecoins grew exponentially during the period under review (Chart 23). The transfer volume of stablecoins has already surpassed that of major payment systems. The unadjusted annual volume of stablecoin transactions reached USD 27.6 trillion in 2024, which is almost 8 percent higher than the combined volume of VISA and Mastercard transactions. [29]

[26] Chainalysis (2024): Stablecoins 101: Behind crypto's most popular asset. https://www.chainalysis.com/blog/stablecoins-most-popular-asset/.

[27] Cryptoslav, I. (2022): Explaining the Silicon Valley Bank Fallout and USDC De-Peg. https://coinmarketcap.com/academy/article/explaining-the silicon-valley-bank-fallout-and-usdc-de-peg.

[28] Governor of Wyoming (2025): Wyoming Stable Token Enters Critical Testing Phase. https://content.govdelivery.com/accounts/WYGOV/bulle tins/3d-8d97a.

[29] Visa 2024 Annual Report. https://annualreport.visa.com/financials/default.aspx, MasterCard Draft Annual Report. https://s25.q4cdn.com/479285134/files/doc_financials/2023/AR/mastercard2024proxystatementdef14a.pdf, DL Research and Plasma (2025): Plasma Redefining Stablecoin Settlement. https://assets.dlnews.com/dlresearch/DL_Research_Report_Plasma_Redefining_Stablecoin_Settlement_v3.pdf, Otychenko, I. (2025): Stablecoin Landscape: What 2024 Reveals About 2025?

2. International regulation of digital finance, its development, regulatory efforts

The past year was an active period in the evolution of EU financial regulations supporting technological development. On the one hand, fundamental legislation of great importance was enacted at the EU level, while on the other hand, rules on the uniform application of existing frameworks were also adopted. One of the key tasks in the past period was to establish the uniform application of the EU regulatory framework for artificial intelligence. To this end, several detailed rules were published at the EU level. In response to the rapid growth of "Buy Now, Pay Later" solutions, the EU modernised the regulation of consumer credit agreements, strengthening consumer protection in the case of these new types of financing. In addition, increased attention was paid to more comprehensive monitoring of the activities of technology giants: the European Supervisory Authorities (ESAs)[30] intend to use a new innovative solution, the "monitoring matrix", to supervise these players more effectively in the future. Furthermore, harmonisation of the classification of crypto-assets at the European level has become a priority. To this end, the ESAs issued guidelines to lay the necessary foundations. In addition to the legal challenges, the regulator also sought to address the uncertainties surrounding tokenised deposits. In order to ensure uniform interpretation and treatment of the concept, the EBA addressed tokenised deposits in a report.

2.1. DEVELOPMENTS IN EUROPEAN UNION REGULATION OF ARTIFICIAL INTELLIGENCE (AI)

Certain general rules of the EU regulation on artificial intelligence (AI Act)[31] already apply from 2 February 2025. The first mandatory requirements of the framework, which will come into force in several stages, include provisions on the definition of AI systems, the prohibition of AI practices that pose an unacceptable risk, and expectations regarding AI literacy. This marks the start of preparations for market participants to apply reliable AI systems that respect EU values in Europe (Table 1). The transition period will not only require resources from AI value chain participants, as the European Commission is also preparing nearly 30 secondary legislative topics to ensure the smooth practical application of the regulation (Table 2).

[30] The European Banking Authority (**EBA**), the European Securities and Markets Authority (**ESMA**) and the European Insurance and Occupational Pensions Authority (**EIOPA**).

[31] Regulation (EU) No 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139, (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828

Table 1
Temporal phases for mandatory application of the AI Act

Affected rules	Start of application
• definitions • prohibition of unacceptable AI practices • AI literacy rules	2 February 2025
• provisions concerning notifying authorities and notified bodies • rules on general-purpose AI models • rules on the governance system at Union and national level • confidentiality rules • sanctions (with the exception of fines imposed on providers of general-purpose AI models)	2 August 2025
• **the Regulation becomes applicable** (with the exception of the rules on high-risk AI systems affected by Union harmonisation under Article 6(1) and the further derogations below)	**2 August 2026**
• rules on high-risk AI systems affected by Union harmonisation under Article 6(1) • compliance deadline for providers of general-purpose AI models placed on the market before 2 August 2025	2 August 2027
• compliance deadline for providers and deployers of high-risk AI systems intended for use by authorities	2 August 2030
• compliance deadline for AI systems that are components of large-scale IT systems established by the legal acts listed in Annex X, which were placed on the market or put into service before 2 August 2027	31 December 2030

Source: MNB based on the AI Act

Table 2
Main secondary legislative topics related to the AI Act

Topic	Regulatory instrument
exemption system for classification rules for high-risk AI systems	delegated act
amendment of use cases (list) for high-risk AI systems	delegated act
amendment of technical documentation requirements for high-risk AI systems	delegated act
amendment of annexes on conformity assessment procedures based on internal auditing and conformity based on assessment of quality management systems and technical documentation	delegated act
inclusion of high-risk AI systems in the scope of the conformity assessment procedure	delegated act
amendment of the content of the EU declaration of conformity	delegated act
modification of thresholds, reference indicators, and reference values related to the classification of general-purpose AI models as posing a systemic risk	delegated act
clarification of criteria for designation as a general-purpose AI model posing a systemic risk	delegated act
specification of measurement and calculation methods related to technical documentation required for providers of general-purpose AI models	delegated act
amendment of the technical documentation requirements for providers of general-purpose AI models	delegated act
suspension, restriction or withdrawal of the designation of a notified conformity assessment body	implementing act
establishment of common standards “to replace standards”	implementing act
approval of codes of practice designed to facilitate the effective implementation of obligations relating to the detection and labelling of artificially generated or manipulated content (or their “replacement” with common rules)	implementing act
approval of codes of practice for providers of general-purpose AI models (or their “replacement” with common rules)	implementing act
detailed rules for the establishment, development, implementation, operation, and supervision of AI regulatory testing environments	implementing act
detailed elements of a plan for testing high-risk AI systems in real-world conditions outside the AI regulatory testing environment	implementing act

Topic	Regulatory instrument
establishment of a scientific body composed of independent experts	implementing act
detailed provisions on the post-market monitoring plan	implementing act
detailed rules and conditions for the assessment of general-purpose AI models	implementing act
detailed rules and procedural safeguards for imposing fines on providers of general-purpose AI models	implementing act
practical implementation of classification rules for high-risk AI systems, comprehensive list of practical examples of use cases for high-risk and non-high-risk AI systems	guideline
elements of the quality management system allowing for simplified compliance	guideline
reporting of serious unexpected events	guideline
application of requirements and obligations for high-risk AI systems	guideline
responsibilities along the AI value chain	guideline
prohibited AI practices	guideline
practical implementation of provisions on significant changes to the AI system	guideline
practical implementation of transparency obligations	guideline
relationship between the AI Act and other relevant EU law	guideline
application of the definition of AI system	guideline

Source: MNB based on the AI Act

The Commission will first assist compliance with the rules that form the cornerstone of the Regulation by publishing guidelines based on extensive industry consultation, updated as necessary in line with technological developments, market experience and new use cases. The first such document[32] was produced in relation to the concept of an *AI system* and provides illustrative guidance on the practical application of the legal construct under the AI Act, with a detailed explanation of the seven basic criteria[33] that make up the definition. Although, as the document itself points out, the interpretation of the regulation falls within the jurisdiction of the Court of Justice of the European Union, and thus the guidelines are not legally binding, they may still effectively assist industry players in assessing whether a given system qualifies as an AI system – and thus falls within the scope of the regulation – or not.

A Commission guideline[34] was also prepared on prohibited AI practices that threaten European values and the fundamental rights of EU citizens and are therefore considered unacceptable. The comprehensive guideline provides a detailed analysis of the scope and prohibition system of the regulation, with a particular focus on the constituent elements and conditions of certain prohibited AI practices, the legislative intent and regulatory objectives behind the prohibitions, and the relationship between the rules and other relevant provisions of EU law beyond the scope of the regulation.[35] The Commission's guidelines also seek to clarify the boundaries of the prohibitions established by the AI Act with practical examples and use cases to help distinguish between prohibited and permitted activities, facilitating both regulatory compliance by industry players and the work of the competent national authorities.

In addition to these two key guidelines, a code of practice for general-purpose AI models was also published in July 2025.[36] The initiative, which was elaborated in a working group system involving a wide range of stakeholders (model providers, downstream providers and other industry players, civil society organisations, and independent experts), aims to develop a regulatory tool that would clarify the requirements of the AI Act for general-purpose AI models, in particular by specifying additional transparency and copyright requirements, as well as security requirements for general-purpose AI models that pose a systemic risk, taking into account state-of-the-art industry practices, it sets out the commitments

[32] Commission Guidelines on the definition of an artificial intelligence system established by Regulation (EU) 2024/1689 (AI Act): https://ec.europa.eu/newsroom/dae/redirection/document/11863.

[33] According to the components of the concept of "AI system" under the AI Act: (1) **machine-based** system, (2) operation with varying levels of **autonomy**, (3) **adaptiveness** after deployment, (4) explicit or implicit **objectives**, (5) **inference**, (6) **outputs** generation (7) influencing the physical or virtual **environment**.

[34] Commission Guidelines on prohibited artificial intelligence practices established by Regulation (EU) 2024/1689 (Artificial Intelligence Act): https://ec.europa.eu/newsroom/dae/redirection/document/118654.

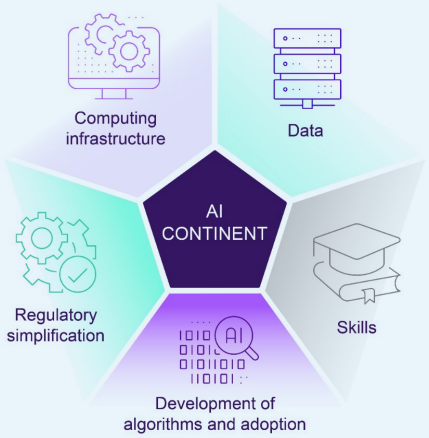
[35] In particular, the relevant provisions of GDPR, the Directive on the protection of personal data processed for law enforcement purposes (Law Enforcement Directive – LED) and EU consumer protection rules.

[36] General-Purpose AI Code of Practice: https://digital-strategy.ec.europa.eu/en/policies/contents-code-gpai.

to be fulfilled by model providers that will ensure full compliance with the rules of the AI Act. In connection with the code's topic, the Commission has also launched a broad targeted consultation,[37] which will form the basis for the subsequent publication of guidelines interpreting the provisions of the regulation relating to general-purpose AI systems.

The spread of trustworthy AI systems in the EU and the creation of the European continent's intended leading position can be encouraged not only by the maturation of AI regulation, but also by a new EU strategic framework and practical initiatives to support AI application and development in the EU. The Commission's new ambitious action plan on artificial intelligence (AI Continent Action Plan)[38] aims to secure the European Union's leading role in the global AI race, while shaping the future of artificial intelligence in a way that promotes and protects European democratic values and cultural diversity (Chart 24). The comprehensive action plan already contains specific short- and medium-term plans for the topics of supercomputer development and computing capacity expansion,[39] cloud and data centre development,[40] AI investment promotion, improving data quality and implementing the data union,[41] increasing the use of AI in strategic sectors and the public sector, training and retraining, skills development and retention, research, international cooperation and overcoming regulatory barriers, while also drawing on a number of parallel strategic documents[42] that are still to be developed in order to achieve the EU's AI objectives.

Chart 24
Action groups of the AI Continent Action Plan



Source: European Commission

One of the basic conditions for responsible AI use is that the relevant actors in the AI value chain – service providers, users and their employees – have the knowledge, awareness and skills necessary to ensure compliance with and proper enforcement of the AI Act. This AI literacy is already required by the regulation as of February this year, which is why the European AI Office has created a continuously expanding repository of information[43] to publish examples of good industry practice in AI literacy and to facilitate the exchange of experiences in this area, which shows what

[37] https://digital-strategy.ec.europa.eu/en/news/commission-seeks-input-clarify-rules-general-purpose-ai-models.

[38] https://commission.europa.eu/topics/eu-competitiveness/ai-continent_en.

[39] You may read more about the AI Factories and AI Gigafactories initiatives at the following link: https://digital-strategy.ec.europa.eu/en/policies/ai-factories.

[40] The consultation on the preparatory work for the Cloud and AI Development Act is available at: https://digital-strategy.ec.europa.eu/en/consultations/have-your-say-future-cloud-and-ai-policies-eu.

[41] The public consultation on the preparation of the Data Union Strategy is available at https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14541-European-Data-Union-Strategy_en.

[42] In addition to the aforementioned Data Union Strategy, there is also the Apply AI Strategy, which aims to accelerate AI in key sectors: https://digital-strategy.ec.europa.eu/en/consultations/commission-launches-public-consultation-and-call-evidence-apply-ai-strategy.

[43] Living repository to foster learning and exchange on AI literacy: https://digital-strategy.ec.europa.eu/en/library/living-repository-foster-learning-and-exchange-ai-literacy.

measures the organisations that have joined the AI Pact initiative[44] to support the early implementation of the AI Act are taking in practice to ensure their organisational AI literacy. Although the collection does not in itself guarantee compliance with the regulation, it can still be a good starting point for developing corporate compliance strategies in terms of AI literacy.

The availability of high-quality data is also a key condition for the development of effective AI models and systems; however, the development of localised large language models (LLMs) may face challenges in this area in a market with linguistic diversity such as the European Union. The European Language Data Space (Language Data Space)[45] project aims to support this cultural and linguistic diversity in the field of artificial intelligence. It seeks to address the shortage of European language data needed for training LLMs by creating a unified "marketplace" dedicated to the collection and sharing of linguistic data, thereby supporting the development of multilingual models and even European LLMs.

In the field of digital finance, one of the latest developments of the EU Digital Finance Platform, the Data Hub, also aims to improve access to high-quality, reliable data. Launched in March 2024, this innovative data centre provides companies, researchers and academics with access to synthetic supervisory data, facilitating the testing of innovative solutions by these actors, currently primarily the training of machine-learning and AI models. Maintaining confidentiality is a key priority in the operation of the Data Hub, which is why only synthetic data is available to authorised users on the platform. The data is synthesised locally at the data reporting service provider's supervisory authority using software purchased through an EU tender process, and the process ensures complete anonymisation, meaning that the original personal data and supervisory information do not leave the custodian's supervision and cannot be identified in the synthetic data set, while the data retain their structure and the statistical characteristics of the original data set. During its first year of operation, the Data Hub fulfilled nearly 100 requests; the data requests were predominantly aimed at training artificial intelligence models, but the initiative will also monitor market demand for data in line with the diversity of innovative use cases and may expand the data purposes that may be served by the platform accordingly.

Legislative preparations for the implementation of the AI Act have already begun in Hungary. Based on the objectives set out in the Government Decree on the measures necessary for the implementation of the AI Act,[46] the legislation expected to be published in autumn 2025, in particular the draft law on the Hungarian Artificial Intelligence Office and the implementation of the European Union's Artificial Intelligence Regulation in Hungary[47] and its implementing rules,[48] will establish the framework and organisation for the application of the AI Act in Hungary and the supervision of AI systems with domestic relevance. The Hungarian Artificial Intelligence Office (Office) will be established, which will be responsible as a national authority for performing notification and market surveillance tasks related to the conformity assessment of AI systems placed on the market, put into service or used in Hungary, excluding the supervision of high-risk AI systems exclusively related to financial services. The latter will be performed by the Magyar Nemzeti Bank. In addition, by 2 August 2026, the Office will establish an AI regulatory test environment that will enable the development, teaching, validation and testing of AI systems under regulatory supervision, for the operation of which it will also be able to use part of the high-performance computing capacity maintained by the state. In addition, the National Accreditation Authority will be assigned a new task and, as a notifying authority, will monitor conformity assessment bodies that can assess the conformity of AI systems. In other words, it will verify whether a certification body is suitable for assessing AI systems. Furthermore, the Hungarian Artificial Intelligence Council, which will operate alongside the Office, will also be an important player in the Hungarian AI framework (Table 3), which will, among other things, contribute to the development and implementation of national policy on the use of AI and support the regulation and application of AI in Hungary through its proposals, initiatives, recommendations and guidelines.

[44] For more information on the initiative, see page 28 of the 2024 FinTech and Digitalisation Report: https://www.mnb.hu/kiadvanyok/jelentesek/fintech-es-digitalizacios-jelentes/fintech-es-digitalizacios-jelentes-2024-julius.

[45] https://digital-strategy.ec.europa.eu/en/news/commission-welcomes-new-initiative-support-european-cultural-and-linguistic-diversity-artificial.

[46] Government Decree 1301/2024. (IX. 30.) on the measures necessary for the implementation of the Regulation of the European Parliament and of the Council on artificial intelligence.

[47] Draft law on the implementation in Hungary of the European Union Regulation on artificial intelligence. https://kormany.hu/dokumentumtar/az-eu-mesterseges-intelligenciarol-sz-rendelete-magyarorszagi-vegrehajtasarol.

[48] Draft Government Decree on the implementation of Act ... of 2025 on the implementation in Hungary of the European Union Regulation on artificial intelligence. https://kormany.hu/dokumentumtar/az-eu-mi-sz-rend-magyarorszagi-vhr-sz-2025-evi-tv-vhr-sz-kr-rend; Draft NGM Decree on the specific rules governing the designation of bodies responsible for assessing compliance with the requirements applicable to high-risk AI systems and on the activities of the designated bodies, as well as on the administrative service fees payable for the designation procedure. https://kormany.hu/dokumentumtar/nagy-kockazatu-mi-rendszerekkel-kapcsolatos-kovetelmenyek-ngm-rendelet.

Public consultation on the relevant standard texts lasted until 16 September 2025.

Finally, in parallel with the legislative processes, Hungary's revised Artificial Intelligence Strategy[49] was adopted, setting out comprehensive economic, social and technological objectives for the period 2025–2030. The Strategy aims to increase Hungary's competitiveness through the use of AI, while maximising social and economic benefits. Among the focus areas of the document is the promotion of the use of artificial intelligence in both the financial and FinTech sectors.

Table 3
Members of the Hungarian Artificial Intelligence Council

Delegate of the National Media and Infocommunications Authority
Delegate of the Magyar Nemzeti Bank
Delegate of the Hungarian Competition Authority
Delegate of the Hungarian National Authority for Data Protection and Freedom of Information
Delegate of the Authority for Regulated Activities of Hungary
Delegate of the National Tax and Customs Administration
Delegate of the Hungarian Artificial Intelligence Office
Delegate of the Minister of Justice
Delegate of the body designated by a government decree to perform certain state tasks falling within the scope of the minister responsible for IT
The Chair of the Council is the person designated to coordinate the government's tasks related to AI

Source: MNB based on the draft AI legislation

2.2. REGULATION OF BNPL SERVICES IN LIGHT OF THE REVISED CONSUMER CREDIT DIRECTIVE

Recent years have seen significant changes in the field of consumer credit, particularly in terms of product range development, changes in consumer habits and the rise of offerings on digital platforms, such as "Buy Now, Pay Later" (BNPL) services. Following a review of the previous directive regulating this area, the European Parliament and the Council adopted new EU-level legislation in October 2023 that responds to these changes and addresses the shortcomings of the previous regulation. One of the new features of the revised Consumer Credit Directive (CCD2)[50] is that it now also covers a significant proportion of BNPL-type arrangements, meaning that BNPL providers may only operate if they hold a supervisory authorisation. As the new regulation is a directive, Member States also have a legislative task: it must be transposed into national law by 20 November 2025, and the new rules shall be applied from 20 November 2026.

The main objective of CCD2 is to strengthen consumer protection and promote the development of a single credit market in the European Union. The modern provisions of the new legislation provide consumers with a higher level of protection and equal protection, particularly when applying for credit electronically. As a general rule, the directive covers all consumer credit agreements below EUR 100,000, including previously unregulated loans below EUR 200 and, in general, BNPL arrangements,[51] which the directive seeks to bring closer to traditional consumer credit by tightening the rules.

Despite its undeniable advantages, the rise of BNPL may also pose significant risks to less informed consumers. The solution is a FinTech service that allows buyers (including businesses) to obtain a product or service immediately, but pay the purchase price or service fee later, in several instalments. The solutions offered by BNPL providers are generally easy to integrate into existing online purchasing processes from a technical standpoint, and they also provide a convenient and – if the repayment is made on time and in full – typically interest-free solution, which can be a flexible and attractive option, especially for younger generations and those who do not have a credit card.[52]

[49] https://cdn.kormany.hu/uploads/document/c/c0/c0d/c0dfdbd37cfa520ae37361a168d244c85e7295af.pdf.

[50] Directive (EU) No 2023/2225 of the European Parliament and of the Council of 18 October 2023 on credit agreements for consumers and repealing Directive 2008/48/EC.

[51] However, an exception to this are interest-free and fee-free deferred payments, where the product seller or service provider – without offering third-party credit – allows the consumer time to pay for the product or service provided, with the full amount due within 50 days.

Although the popularity of these services has grown dynamically worldwide in recent years, they can also involve significant risks. These risks include a lack of thorough creditworthiness checks, impulse buying, overspending and the resulting excessive indebtedness, as well as insufficient information, hidden and unforeseeable costs, and manipulative advertising, which may pose additional risks to consumers.

In order to promote responsible, informed consumer credit decisions, CCD2 tightens the rules on credit advertising and the obligations to provide consumers with information prior to the conclusion of a contract. Advertisements relating to credit agreements must be clear and fair, draw attention to the costs of borrowing, and any marketing communication that could give consumers false expectations about the loan, especially by falsely suggesting that it improves their financial situation or raises their standard of living, is prohibited. In addition to the general rules of the directive promoting financial education, uniform, clear and understandable credit information will be facilitated by the so-called Standard European Consumer Credit Information Form, which contains the main elements and key information of the credit in a concise form, even on a mobile phone screen, thus helping consumers to understand and compare different credit products and offers and to identify the potential risks associated with taking out a loan (Table 4). Transparency is also served by the provisions of the directive that require explicit consumer consent, so that creditors and credit intermediaries cannot assume, by default, for example by using pre-ticked checkboxes, that the consumer agrees to conclude an agreement or purchase a related service.

Compared to the previous legislation, the revised directive also pays particular attention to creditworthiness checks. Lending may only take place if a thorough creditworthiness assessment, based on relevant and accurate information regarding the consumer's income, expenses, and other financial and economic circumstances – proportionate and necessary in relation to the type, duration, amount of the credit, and the risks affecting the consumer – demonstrates that the prospective borrower is likely to be able to repay their debt in accordance with the contract. In line with the growing future role of artificial intelligence in credit assessment and creditworthiness assessment, and in alignment with the provisions of the AI Act and the GDPR, the directive already requires lenders to ensure human intervention in the case of creditworthiness assessments based on automated data processing. In addition to providing a clear and understandable explanation of the processes, risks and decision-making logic, this also means ensuring that specific decisions related to creditworthiness and credit granting are reviewed by humans. The above measures may contribute to responsible lending practices and reduce the risk of excessive indebtedness, but from the perspective of BNPL providers, the additional costs of regulatory compliance may even encourage them to rethink their existing business models.

Table 4
Key elements of the Standard European Consumer Credit Information form

Key elements of the standard European consumer credit information
Identification data of the creditor or credit intermediary
Total amount of credit (the upper limit or total amount made available under the credit agreement)
Duration of the credit agreement
The borrowing rate or, where applicable, the different borrowing rates applicable to the credit agreement
Annual percentage rate of charge (APR)
Total amount payable by the consumer (i.e. the sum of the total amount of credit and the total cost of credit borne by the consumer)
Where applicable: name of the product, service, indication of deferred payment
Costs arising in case of late payment
The amount of repayments and, where applicable, the order in which repayments are allocated
A warning concerning the consequences of failure to make payments or late payments
The existence or absence of the right of withdrawal and, where applicable, the withdrawal period
The existence of the right of early repayment and, where applicable, information on the creditor's right to compensation
Postal address, telephone number and email address of the creditor, and where applicable, the postal address, telephone number and email address of the credit intermediary concerned

Source: MNB based on CCD2

[52] According to the BIS analysis, BNPL users are typically under 35 years of age, have lower levels of education, have poorer credit ratings and have higher rates of late payments (BIS: Buy now, pay later: a cross-country analysis: https://www.bis.org/publ/qtrpdf/r_qt2312e.pdf).

Box 1

A new EU tool has been created to monitor the activities of tech giants active in the financial sector: the BigTech monitoring matrix

In February 2025, data collection began under the BigTech monitoring matrix, the European Union's new tool for examining tech giants. The matrix was created under the auspices of the European Forum for Innovation Facilitators (EFIF)[53] – a joint EU knowledge-sharing body of Member State platforms supporting financial innovators (Innovation Hubs and Regulatory Sandboxes) – and will provide a regularly updated overview of BigTech companies' activities in the European Union's financial sector based on multiple data sources, thereby increasing the EU-level supervisory and regulatory visibility of these companies.

The aim of the matrix is therefore, on the one hand, to provide supervisory authorities with a better overview of the type and volume of financial services provided directly and indirectly by BigTech companies and, on the other hand, to provide a more complete picture of the relevance of these companies in the EU financial sector by involving additional data sources, such as the examination of technology provider relationships. Based on the ESA's assessment, the tool thus covers not only large companies[54] deemed relevant, but also certain non-banking, so-called mixed activity groups (MAGs) and some large payment service providers (PSPs),[55] as well as certain gatekeepers designated under the EU's Digital Markets Act (DMA).[56, 57]

The matrix, which is created within the framework of EU-level data reporting cooperation and may be reviewed periodically and dynamically in line with market developments, contains data points that ensure the mapping of the roles of the listed institutions in each activity group and are also suitable for examining the links between individual companies and financial and non-financial organisations. Overall, the matrix thus allows for a better understanding of the relevance of individual BigTech companies in the financial sector, which, if required to preserve financial stability, could later serve as the basis for dedicated BigTech regulation.

2.3. CLASSIFICATION OF CRYPTO-ASSETS IN THE EU

The classification of crypto-assets poses a new challenge for both market participants and regulators. In order to reduce uncertainty, the ESAs – in cooperation with Member State supervisory authorities – have provided guidance on when crypto-assets would qualify as financial instruments[58] (Chart 25). MiCA[59] has established a uniform framework for the classification of crypto-assets within the European Union. In this regard, it has been established that crypto-assets that qualify as regulated products (e.g. transferable securities) are not subject to MiCA, but rather to the relevant EU and Member State regulations (e.g. MiFID II[60] and the national rules transposing such). The guidelines are intended to promote a relatively uniform classification of crypto-assets across the EU.

[53] The Magyar Nemzeti Bank participates in the EFIF as a Hungarian member.

[54] Alphabet, Amazon, Ant Group, Apple, Meta, Microsoft, NTT Docomo, Rakuten, Tencent, Tesla, Uber, Vodafone.

[55] Adyen, Fiserv, Nexi, PayPal, Verifone, Worldline.

[56] For more information on the DMA, gatekeepers, and essential platform services, see Box 2 on page 30 of the 2024 FinTech and Digitalisation Report: https://www.mnb.hu/en/publications/reports/fintech-and-digitalisation-report/fintech-and-digitalisation-report-july-2024.

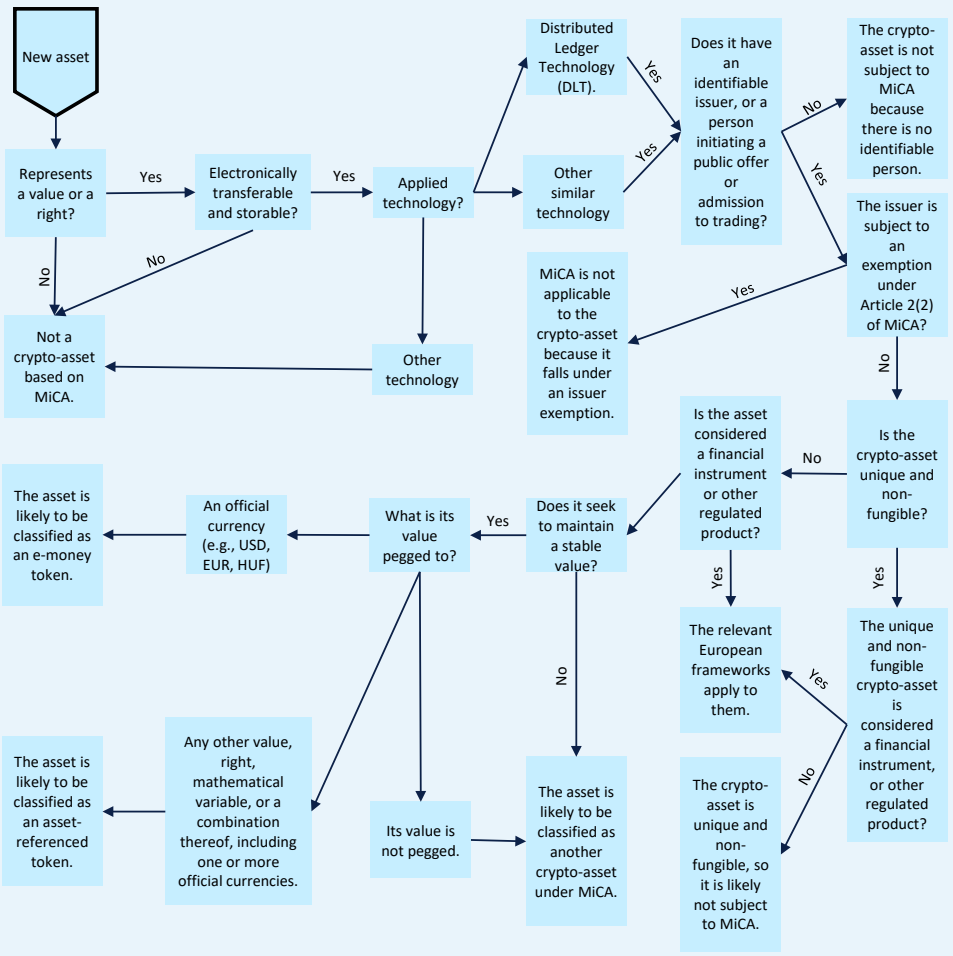
[57] Alphabet, Amazon, Apple, ByteDance, Booking.com, Meta, Microsoft.

[58] ESMA (2024): Final Report Guidelines on the conditions and criteria for the qualification of cryptoassets as financial instruments. https://www.esma.europa.eu/sites/default/files/2024-12/ESMA75453128700-1323_Final_Report_Guidelines_on_the_conditions_and_criteria_for_the_qualification_of_CAs_as_FIs.pdf, EBA-ESMA-EIOPA (2024): Final Report Guidelines on templates for explanations and opinions, and the standardised test for the classification of crypto-assets, under Article 97(1) of Regulation (EU) 2023/1114. https://www.esma.europa.eu/sites/default/files/2024-12/Joint_ESA_Final_ Report_on_Art_97_Guidelines_MiCAR.pdf.

[59] Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 59 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937 (**MiCA**).

[60] Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014, on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (**MiFID II**).

Chart 25
Scheme for the classification of crypto-assets



Source: MNB based on EBA–ESMA–EIOPA (2024)

The classification has two pillars: technological neutrality and content primacy over form. **The next step in the assessment is to determine whether the asset qualifies as a regulated product (e.g. a financial instrument)**. When classifying a digital asset, the first thing to examine is whether it meets the conceptual elements of a crypto-instrument.[61] If the asset passes the test, it can essentially be considered a kind of "technical container" and its content will determine its classification. If the asset qualifies as a crypto-asset, the next step is to determine whether it falls under the exceptions under MiCA (e.g. issuerless asset) or qualifies as a regulated asset. If the crypto-asset cannot be classified under either existing products or exemptions, it qualifies as a crypto-asset under MiCA, or a stablecoin[62] in certain cases.

A crypto-asset is considered a financial instrument if it falls into one of the categories of financial instruments listed in MiFID II, even if it has other functions, provided that it is not regularly used to settle debt. The categories of financial instruments are defined by capital market regulations. In order for a crypto-asset to qualify as such, it must meet the characteristics of the asset group. In this case, it is subject to the same rules as existing financial instruments. The most important types of financial instruments are transferable securities, investment fund shares (participation in collective investment trusts) and derivatives.

[61] According to Article 3(1)(5) of MiCA, a crypto-asset "*means a digital representation of a value or of a right that is able to be transferred and stored electronically using distributed ledger technology or similar technology*".

[62] Digital units of value that rely on stabilisation tools and mechanisms to minimise fluctuations in their value expressed in a reference currency (e.g. USD, EUR, any basket, mathematical variable). Bullmann, D.– Klemm, J. – Pinna, A. (2019): In search for stability in crypto-assets: are stablecoins the solution? ECB Occasional Paper No. 230. https://www.ecb.europa.eu/pub/ pdf/scpops/ecb. op230~d57946be3b.en.pdf.

However, it may happen that the most important feature of a crypto-asset – which could even qualify as a financial instrument – is its function as a means of payment[63] (*instrument of payment*), i.e. it is regularly used to settle debts or liabilities. In this case, these instruments cannot be considered financial instruments. This is particularly important when classifying asset-referenced tokens, as in practice they are created to settle debts. There are three conditions for a digital asset to be classified as a transferable security: it must be transferable (marketable), it must be replaceable with a product issued by an issuer that provides the same rights (pooling), and it must be similar in nature to any known securities (shares, bonds, etc.). An example of this is a token that embodies membership rights (e.g. voting rights, entitlement to dividends) in an organisation. A type of asset similar to transferable securities – which needs to be examined – is the group of money market instruments[64] (e.g. treasury bills, deposit certificates). An example of this would be a token with a short maturity, stable value and returns aligned with short-term interest rates.[65] The next group consists of investment fund shares or shares in collective investment trusts. For a token to qualify as such, an initiative is required that involves the collection of capital from multiple investors[66] and its investment in accordance with a specific investment policy for the benefit of the investors, while embodying claims and other rights against the initiative. It is also necessary that the project is not created for general commercial or industrial purposes, but primarily to generate returns. It is important that, in this case, the holders of crypto-assets cannot exercise day-to-day control over the asset management.[67] Asset-referenced token issuers under MiCA – as they intend to issue assets that in practice serve to settle debt – would typically not qualify as a collective investment trust due to their nature as a means of payment. Finally, it may also be argued that crypto-assets could be *derivatives*.[68] This would require that the rights of crypto-asset holders depend on a contract based on a future commitment (which could be a futures, options or swap contract), resulting in a time lag between the conclusion of the agreement and its fulfilment, the value of the crypto-asset derives from and tracks the value of an underlying asset, and the product is settled and cleared in a manner known in the capital markets.[69] If the token tracks the price of the reference asset through reserve backing, it may be considered an asset-referenced or e-money token under MiCA, depending on the type of reference asset.

If a crypto-asset is not subject to capital market regulation, it does not necessarily mean that it falls within the scope of MiCA. This is evident, for example, in the case of *non-fungible tokens* (NFTs). In order for a crypto-asset to qualify as an NFT, it must have characteristics and/or rights that clearly distinguish it from other crypto-assets issued by the issuer (or any other party). If the value of a crypto-asset derives largely from its similarity to other crypto-assets with the same characteristics, the crypto-asset is considered fungible. If, on the other hand, digital assets derive their value from their unique characteristics or specific utility to the holder, while still being tradable and speculative, they are not considered fungible, as their value cannot be easily compared to other assets.[70] It is clear that the concept of NFT used by market participants differs from the concept of NFT under MiCA. The latter covers a much narrower scope. Individual parts of *fractionalised NFTs* are typically considered fungible if ownership of the original NFT can be acquired by combining all of them.

Assets that have characteristics of multiple asset groups should be carefully assessed on a case-by-case basis.
If such hybrid crypto-assets have the characteristics of any financial instrument, they should be treated as such. The essential characteristics of hybrid crypto-assets should be taken into account when classifying them. It is important to note that their functions may change during their life cycle, meaning their legal classification may also have a "temporal scope".

[63] Cash substitute payment instrument.

[64] These are typically short-term debt instruments issued by governments, credit institutions, or companies to raise funds from the money market.

[65] Deloitte (2024): ESMA clarifies which crypto-assets might qualify as financial instruments in the EU. https://www.deloitte.com/lu/en/Industries/investment-management/perspectives/ESMA-clarifies-which-crypto-assets-might-qualify-as-financial-instruments-in-the-EU.html.

[66] It is irrelevant whether investors contribute to the pool with cash or crypto-assets.

[67] This arises, for example, in the case of liquid staking. ESMA (2024): Treatment of staking services in MiCA Q&A. https://www.esma.europa.eu/publications-data/questions-answers/2067.

[68] Crypto-assets may be the underlying assets of derivatives (e.g. crypto-asset baskets or indices). Such investment products are essentially traditional financial instruments.

[69] E.g. physical delivery or settlement in cash or possibly other crypto-assets.

[70] The "value dependency test" proposed by ESMA shows whether a crypto-asset is unique and non-interchangeable. In this context, it is necessary to examine whether (i) the value of the crypto-asset derives primarily from its unique characteristics and/or the utility/benefits it provides to its holder; (ii) the degree of interconnection between different types of crypto-assets, which affects their value in such a way that the NFT has no value of its own that is separate from the other NFTs in the series or collection; and (iii) the unique characteristics that distinguish these crypto-assets from others.

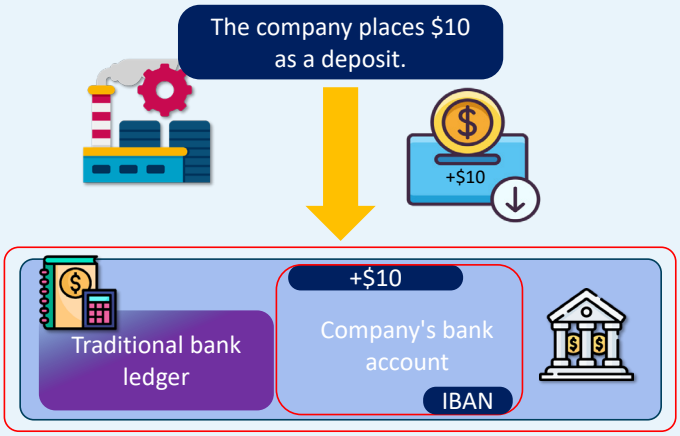
ESMA's efforts towards harmonisation are undoubtedly welcome, but unlike MiCA, the regulation of capital market products varies from Member State to Member State (the EU has only set a minimum level of regulation); therefore, there are also differences in the classification of financial instruments. Greater harmonisation of capital market rules appears necessary to create a single European playing field (*Savings and Investment Union*).

2.4. TOKENISED DEPOSITS: BANKING PRODUCTS ON THE DISTRIBUTED LEDGER

Although practical implementation is still in its infancy, according to the EBA report, European credit institutions' interest in tokenised deposits is growing already in the short term. This refers to the representation of tokenisation rights in digital form, which is achieved through the use of *distributed ledger technology* (DLT) or other similar technologies. In the case of tokenised deposits, the depositor's claim against the credit institution is recorded on DLT rather than in the traditional ledger. A joint survey conducted by the EBA and Member State supervisory authorities in 2024[71] identified unnamed initiatives in the EEA,[72] but according to the report, 17 percent of EEA banks intend to engage in tokenised deposits over the next two years, and supervisory authorities are also paying close attention to such efforts.[73]

Tokenised deposits can be implemented via several technological models. A credit institution may decide to place the registration of deposits entirely on DLT (*one-layer model*) instead of the traditional ledger (Chart 26), so that the tokens representing the deposits are created directly on the blockchain (Chart 27). In other cases, DLT is used only as an auxiliary, secondary register, with deposits recorded in an off-chain database, in which case a reconciliation procedure is required between the two types of registers (Chart 28). In this hybrid solution, it is possible that the tokens recorded on the DLT do not represent deposit claims but are classified as electronic money, for example, in which case the customer's deposit claims are recorded in the traditional bank ledger. However, it is also possible for the bank to record deposit claims in both registers, in which case the sum of the two registers will be the customer's deposit portfolio.

Chart 26
Operation of a traditional bank ledger



Source: EBA

[71] https://www.eba.europa.eu/sites/default/files/2024-12/4b294386-1235-463f-b9b5-08f255160435/Report%20on%20Tokenised%20deposits.pdf.

[72] According to market news, the most significant project is Commercial Bank Money Token (CBMT), in which five banks and five companies are participating.

Binance News (2024): EBA Analyzes Regulatory Aspects of Tokenized Deposits. https://www.binance.com/en/square/post/12-15-2024-eba-analyzes-regulatory-aspects-of-tokenized-deposits-17583027747001.

Blockstories Intel (2025): European Banks & Digital Assets Tracker. https://data.blockstories.io/.

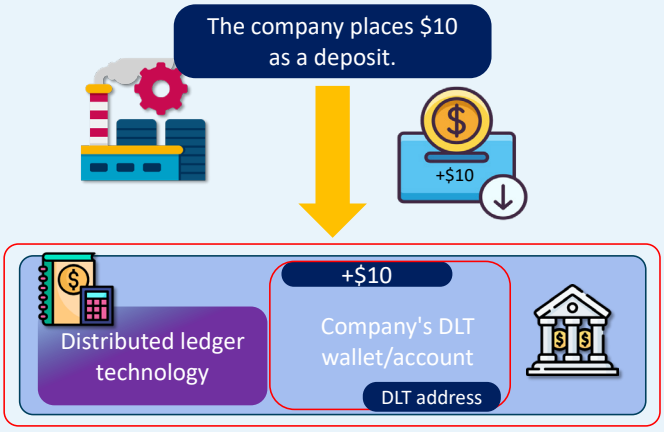
Schönborn, S. – Schubert, F. – Spur, K. (2024): Commercial Bank Money Token Proof of Concept Report New Forms of Money in an Era of Evolving Industrial Needs. https://die-dk.de/media/files/240716_DKBDI_position_CBMT_final.pdf.

[73] Bank of England PRA (2024): A, Dear CEO Letter, Innovations in the use by deposit-takers of deposits, e-money and regulated stablecoins.

https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/letter/2023/november/innovations-in-the-use-of-deposits-emoney-and-regulated-stablecoins.pdf.

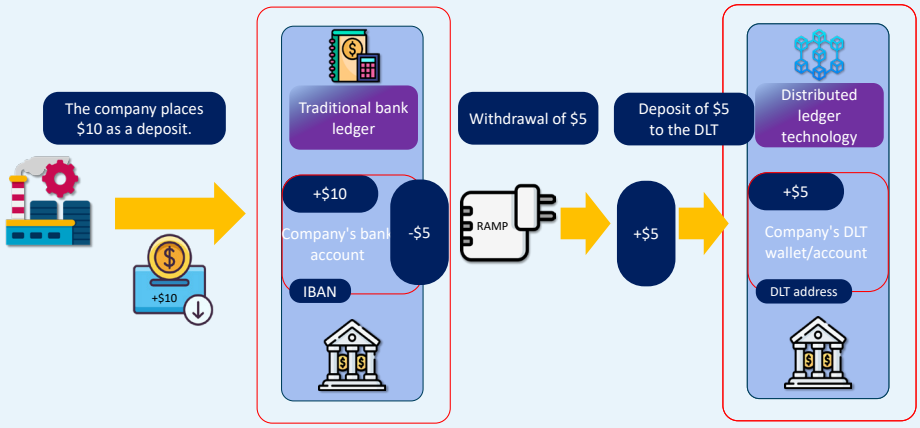
Sigimura, K. – Bessho, M. (2024): Deposit Tokenization: Survey of Overseas Initiatives. https://www.boj.or.jp/en/research/wps_rev/rev_2024/data/rev24e09.pdf.

Chart 27
Operation of a banking registry placed entirely on DLT



Source: EBA

Chart 28
Operation of a hybrid model (combining traditional and DLT registries)



Source: EBA

In theory, tokenised deposits can either be linked to the depositor or be transferable, i.e. in the former case, they can be *account-based*, and in the latter, they can be *token-based*. The initiatives examined in the report are account-based, meaning that the depositor's claim is recorded on the DLT linked to the account holder and cannot be directly transferred to a person who is not a customer of the bank. Given that the use of the new technology does not in itself change the fundamental nature of the claims, they continue to qualify as deposits under the existing rules. However, according to the report, a token-based model could also be theoretically viable, where the deposit could be transferred to another person without the bank's knowledge, similar to a bearer instrument. While, as described above, the account-based model would be similar to most traditionally recorded deposits, the legal viability of the token-based model, the applicable regulatory framework, and the classification of the instrument would require thorough and extensive assessment. In view of this, the EBA itself focused on account-based solutions in the report.

Due to the use of innovative technology, the advantages and risks of tokenised deposits are also novel. The programmability of the product and the possibility of instant (atomic) settlement allow transactions to be executed more efficiently, while anti-money laundering measures (e.g. blocking transfers to sanctioned persons) can be "hard-coded" into the product. However, the operational and liquidity risks of tokenised deposits are obvious, and it is not certain that they will promote financial inclusion. According to the report, due to customer identification and Basel rules on crypto-assets, banks will use *permissioned* blockchains. Nevertheless, it is clear that credit institutions will have to take into account and manage the risks associated with blockchain systems, such as settlement problems due to service outages or the risk of *vendor lock-in*. Hansen (2024) also points out that in order to use account-based tokenised deposits and develop applications for them, one must be a bank customer, which limits their interoperability and accessibility.[74]

The authors of the report believe that the use of tokenised deposits may also have an impact on the liquidity position of banks, especially in stress situations (e.g. bank panics), but it is still too early to assess how "sticky" tokenised deposits are, i.e. it is not clear in which cases bank customers would "transfer" their tokenised deposits registered with one bank to another institution. Similarly, further research is needed on how the spread of tokenised deposits could affect financial stability.[75] In terms of financial inclusion, leveraging the benefits of tokenised deposits requires adequate financial education and digital skills, meaning these benefits may be realised to a limited extent and may even lead to financial exclusion in cases where users have low digital and financial literacy[76] or limited access to the necessary digital channels and tools, such as digital wallets.

The EBA has emphasised the importance of distinguishing between tokenised deposits and electronic money tokens (EMTs) issued by banks (Table 5). What these asset types have in common is that they both use distributed ledger technology, represent a bank liability and are redeemable at par value. However, while (account-based) tokenised deposits are registered assets, i.e. they are linked to the account holder, stablecoins are transferable, and the rights and obligations they represent are linked to the ownership of the token, thus entitling and obligating the current holder of the token (the person who actually controls the token). Therefore, as mentioned above, EMTs, as stablecoins, can be directly transferred even on the secondary market due to their carrier nature, unlike tokenised deposits. Payments made with account-based tokenised deposits may extinguish an obligation at the payer's bank and create an obligation at the payee's bank, and the transfer of the specific amount of money to the payee requires interbank settlement. For these reasons, tokenised deposits and stablecoins are likely to continue to coexist: tokenised deposits may offer new opportunities in intra-bank or interbank applications, while stablecoins may remain present in the global financial system due to their global liquidity, accessibility and network effects.

Table 5
Comparison of tokenised deposits and EMTs issued by credit institutions under MiCA

Aspect	Tokenised deposit	EMT under MiCA
Claim against the credit institution's balance sheet	✔	✔
Uses DLT or similar technology	✔	✔
Continuous contractual relationship between the credit institution and the customer/token holder	✔	✖
Transferable on the secondary market	✖	✔ (bearer instrument)*
Settlement asset	✖ (currently not)	✔
Value	The nominal value of the official currency	The targeted reference asset
Repayment/redemption at face value	✔	✔
Interest payment	✔	✖
Maturity	✔ (in the case of a long-term deposit)	✖
Main regulations	banking, deposit insurance and AML rules	Rules on crypto-assets and electronic money, as well as AML rules. No deposit insurance rules.

*Note: *Practice shows that for some EMTs, the transferability of the token can be restricted in the smart contract, for example in the case of blacklisted addresses. **A settlement asset is used to settle a financial transaction between parties; this is the asset through which the final money transfer takes place and which ensures the completion of the transaction. In the case of transfers between clients of different credit institutions involving deposit accounts, an accompanying interbank settlement is necessary for the transaction to be completed, meaning that the "deposit" itself is not used for this settlement; instead, a withdrawal is made from the deposit account, and an electronic transfer of these funds takes place.*

Source: EBA

[74] Hansen, P. (2024): Tokenized Deposits vs. Stablecoins. https://www.linkedin.com/posts/patrickghansen_stablecoins-tokenizeddeposits-activity-7279480439751278592-Y25V?utm_source=share&utm_medium=member_desktop&rcm=ACoAABVkMgIBwDvrxJJtNAcDdD59UyYAukvo_4A.

[75] The FSB noted that "*tokenisation may, however, have implications for financial stability under certain conditions, for example, if the tokenised part of the financial system grows significantly, if the complexity and opacity of tokenisation projects lead to unpredictable situations in times of stress, and if certain risks are not adequately addressed through oversight, regulation, supervision, and enforcement*". FSB (2024): The Financial Stability Implications of Tokenisation, pp 2. https://www.fsb.org/uploads/P221024-2.pdf.

[76] Inadequate financial literacy may lead, for example, to household users potentially confusing tokenised deposits with stablecoins. This may be exacerbated by issuers' unclear and misleading disclosures.

2.5. SUPPORT AND REGULATION OF INNOVATION GAINS NEW MOMENTUM IN THE UNITED STATES

With the inauguration of the new administration, the United States' previously cautious approach has been replaced by a pioneering, supportive stance on financial innovation. The new policy direction was declared in Presidential Executive Order,[77] issued on 23 January 2025, which states that supporting the responsible growth and use of digital assets, blockchain and related technologies will be a priority across all sectors of the U.S. economy. This approach aims to support the development of a vibrant, inclusive digital economy and innovation in digital assets through, among other things, predictable and technology-neutral regulation, transparent decision-making and fair access.

The new innovation policy, aimed at protecting the sovereignty of the US dollar, has opted for USD-based stablecoins over central bank digital currency (CBDC), and, citing concerns about financial stability and privacy, the presidential decree prohibited efforts to create a US CBDC and established a presidential working group (Working Group) on crypto-assets. The Working Group published a report on its work on 30 July 2025.[78] In addition to descriptive analyses and findings, the Working Group also made a number of recommendations to individual state actors. For example, it considers it particularly important to clarify the regulatory framework, encourage banks and other financial institutions to actively participate in the crypto-asset ecosystem, support stablecoins and payment systems, take more effective action against money laundering and terrorist financing, and modernise tax rules. In addition to professional analysis, the new administration intends to comprehensively regulate the crypto-asset ecosystem (with the GENIUS Act, the CLARITY Bill, and the Anti-CBDC Bill).

The GENIUS Act,[79] signed by the US president on 17 July 2025, is a milestone, as it provides a comprehensive framework for the regulation of stablecoins. Under the Act, only licensed issuers (e.g. US banks, stablecoin issuers recognised at the federal or state level) may issue stablecoins for use by U.S. persons, with certain exceptions and safe harbours. Issuers with a large banking background will be supervised by the Fed,[80] issuers of stablecoins with a capital value exceeding USD 10 billion will be supervised by the OCC, while issuers of stablecoins with a capital value of less than USD 10 billion will remain under state supervision. Issuers are required to fully back the stablecoins they issue with US dollars, short-term treasury bills or similarly highly liquid assets. The law also regulates the use of reserves and the custody of stablecoins. Under the new rules, foreign issuers will be required, among other things, to use a US crypto-asset service provider if they wish to sell their stablecoins in the United States. It is forward-looking that the GENIUS Act explicitly states that stablecoins are not considered securities.[81]

The pending CLARITY Bill[82] creates a regulatory framework for virtual assets.

It is noteworthy that the concept of virtual assets is very similar to the European concept of crypto-assets: they are digital representations of value recorded in a cryptographically secure distributed ledger or other similar technology. According to the bill, the US Commodity Futures Trading Commission[83] is responsible for regulating virtual assets that do not qualify as securities, including digital commodity exchanges, brokers and traders. To trade on the exchange, the digital commodity blockchain must be mature, or the issuer of the digital asset must submit certain reports from time to time.

[77] Strengthening American Leadership In Digital Financial Technology (2025a). https://www.whitehouse.gov/presidential-actions/2025/01/strengthening-american-leadership-in-digital-financial-technology/.

[78] Strengthening American Leadership In Digital Financial Technology (2025b): https://www.whitehouse.gov/crypto/.

[79] Guiding and Establishing National Innovation for U.S. Stablecoins Act. https://www.congress.gov/bill/119th-congress/senate-bill/1582/text.

[80] *Federal Reserve* (**Fed**), and the Office of the Comptroller of the Currency (**OCC**).

[81] The SEC's Division of Corporate Finance stated that, for four types of staking, a public offering of securities typically does not arise. SEC Division of Corporation Finance (2025a): Statement on Certain Protocol Staking Activities. https://www.sec.gov/ newsroom/speeches-statements/statement-certain-protocol-staking-activities-052925 SEC Division of Corporation Finance (2025b): Statement on Certain Liquid Staking Activities. https://www.sec.gov/newsroom/speeches-statements/corpfin-certain-liquid-staking-activities-080525.

[82] Digital Asset Market Clarity Act of 2025. https://www.congress.gov/bill/119th-congress/house-bill/3633/text.

[83] *Commodity Futures Trading Commission* (**CFTC**).

The pending Anti-CBDC Bill[84] explicitly prohibits the Fed from issuing CBDC directly to households or through intermediaries. This law aims to protect financial privacy and preserve individual freedoms by preventing a potential CBDC from giving the government too much control over citizens' finances. Another notable example of a "crypto-friendly" approach is the creation of strategic crypto reserves in the United States. In 2025 Q1, economic and political debates on the use of BTC as a reserve asset were already dominant.[85] In this climate, the President announced the creation of the reserves on his social media page on 3 March 2025, and the relevant Executive Order was published on 6 March.[86] Three states in the United States have already passed legislation allowing the state to accumulate BTC reserves.[87] In addition, the President has issued an executive order instructing the US Department of Labor to regulate pension funds to acquire crypto asset exposure through other public funds.[88] He has also issued an Executive Order against so-called *debanking*[89] practices so that, for example, companies dealing in crypto-assets also have access to banking services.

In parallel with the evolution of government policy, the SEC's attitude toward crypto-assets also changed radically during the examined period. It is worth noting that on 31 July 2025, the head of the authority, Paul S. Atkins, announced the Project Crypto initiative, which is aimed at modernising US capital market regulation and "moving the entire U.S. capital market onto the blockchain".[90]

It is also worth pointing out that a change of direction was already visible in the US Securities and Exchange Commission prior to this bold initiative. On 10 January 2024, the SEC approved for the first time the listing of several investment funds with BTC as their (primary) asset (*spot*) on the US stock exchanges.[91] The decision is a milestone, as the SEC had previously rejected such initiatives at least 20 times.[92] Shares and collective investment securities issued by investment funds and similar entities that invest directly in BTC have thus become available on US stock exchanges.

[84] Anti-CBDC Surveillance State Act. https://www.congress.gov/bill/119th-congress/house-bill/1919.

[85] The Governor of the Czech National Bank, Aleš Michl, suggested that the central bank should consider keeping 5 percent of its reserves in BTC. This led to heated debates between the central banks of individual member states and the European Central Bank. Currently, the parties involved reject the use of BTC as a reserve.
Aleš, M. (2025): Governor Michl's thoughts on bitcoin – a test portfolio in CNB's foreign exchange reserves. https://www.cnb.cz/en/public/ media-service/interviews-articles/Governor-Michls-thoughts-on-bitcoin-a-test-portfolio-in-CNBs-foreign-exchange-reserves/ Reuters (2025): ECB's Lagarde slaps down Czech proposal for bitcoin reserves. https://www.reuters.com/markets/europe/ecbs-lagarde-slaps-down-czech-proposal-bitcoin-reserves-2025-01-30/
Business insider (2025): Glapiński o rezerwach w bitcoinie. Jasne stanowisko. https://businessinsider.com.pl/gospodarka/prezes-nbp-nie-rozwazamy-trzymania-rezerw-w-bitcoinach/tngshsc.

[86] Establishment of The Strategic Bitcoin Reserve and United States Digital Asset Stockpile. https://www.whitehouse.gov/presidential-actions/2025/03/establishment-of-the-strategic-bitcoin-reserve-and-united-states-digital-asset-stockpile/.

[87] Dioquino, V. (2025): Texas Joins Growing List of US States With Bitcoin Reserves. https://decrypt.co/326427/texas-us-states-bitcoin-reserves
State Reserve Race (2025): https://bitcoinlaws.io/reserve-race.

[88] Democratizing access to alternative assets For 401(K) investors. https://www.whitehouse.gov/presidential-actions/2025/08/democratizing-access-to-alternative-assets-for-401k-investors/.
US Department of Labor (2025): US Department Of Labor Rescinds 2022 Guidance On Cryptocurrency In 401(K) Plans. https://www.dol.gov/newsroom/releases/ebsa/ebsa20250528.

[89] Any action by a bank, savings bank, cooperative bank, or other financial institution that directly or indirectly adversely limits or modifies any client's or potential client's access to accounts, credit and cash loans, or other banking products or financial services based on the political or religious beliefs of the client or potential client, or on the lawful business activities of the client or potential client that the financial service provider disagrees with or disapproves of for political reasons.

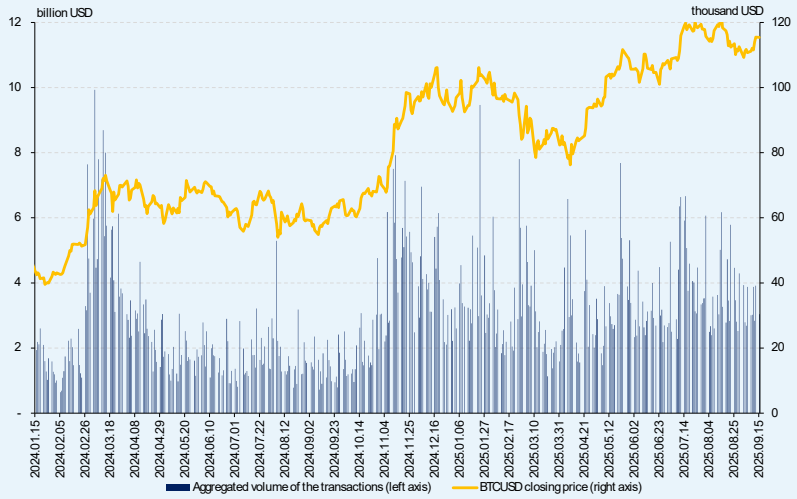
[90] Atkins, P.S. (2025): American Leadership in the Digital Finance Revolution. https://www.sec.gov/newsroom/speeches-statements/atkins-digital-finance-revolution-073125.

[91] The assets concerned are publicly available securities issued by *exchange-traded funds* (ETFs) that track the spot price of BTC or other crypto assets by holding the relevant crypto-assets in reserve and backing the securities issued by the fund. Crypto ETFs allow investors to gain crypto-asset exposure without having to hold a crypto-asset wallet or use trading platforms. For institutions, ETFs offer a regulated and safe way to include crypto-assets in their portfolios, promoting diversification and potentially increasing returns

[92] Gensler, G. (2024): Statement on the Approval of Spot Bitcoin Exchange-Traded Products. https://www.sec.gov/newsroom/speeches-statements/gensler-statement-spot-bitcoin-011023.

The SEC's decision is a step towards integrating BTC into the traditional financial system.[93] In addition to allowing more crypto ETFs to be listed in the US, the SEC's decision may also lead to the launch of new crypto funds in Europe.[94] Since then, there has been quite strong interest in such ETFs. Between 11 January 2024 and 15 September 2025, the daily transaction volume of securities issued by the 12 largest investment funds investing directly in BTC generally amounted to several billion USD, typically following the BTC price (Chart 29). During the examined period, an average of USD 2.9 billion per day was transacted in products issued by the investment funds concerned.

Chart 29
Daily volume of transactions of securities issued by the twelve most significant spot BTC-investing investment funds in light of the daily closing price of BTC



Note: To create the diagram, the MNB took into account the trading data of the following funds: BlackRock (IBIT), the Grayscale Bitcoin Trust (GBTC), Grayscale Bitcoin Mini Trust ETF (BTC), Fidelity (FBTC), Ark Invest/21Shares (ARKB), Bitwise (BITB), Franklin (EZBC), Invesco/Galaxy (BTCO), VanEck (HODL), Valkyrie (BRRR), WisdomTree (BTCW) and Hashdex (DEFI).
Source: The Block, Yahoo Finance, CoinMarketCap

In addition to digital tools, the development of artificial intelligence also plays a key role in the United States in order to strengthen its global leadership. At the beginning of the year, a Presidential Executive Order regulating artificial intelligence[95] issued in 2023 was revoked, arguing that it had hindered AI innovation and imposed unnecessary burdens on AI developers. The President's new AI Executive Order,[96] signed in January 2025, aims to spur AI innovation in the United States and strengthen global technology leadership, while reducing the regulatory burdens imposed by the previous administration. To this end, the development of a comprehensive AI action plan and a review of measures taken under the previous Executive Order have been mandated.

[93] Foley & Lardner LLP (2024): SEC Greenlights Bitcoin ETFs: What Happened and What It Portends. https://www.foley.com/insights/publications/2024/01/sec-greenlights-bitcoin-etfs/
On 17 September 2025, the SEC adopted general listing rules for exchange-traded funds and other products whose underlying assets are commodities, including crypto-assets. SEC (2025): SEC Approves Generic Listing Standards for Commodity-Based Trust Shares. https://www.sec.gov/newsroom/press-releases/2025-121-sec-approves-generic-listing-standards-commodity-based-trust-shares; https://www.sec.gov/files/rules/sro/nasdaq/2025/34-103995.pdf.

[94] Kehnscherper, L. – Nicolle, E. (2025): BlackRock to List Bitcoin Exchange-Traded Product in Europe. https://www.bloomberg.com/news/articles/2025-02-05/blackrock-said-to-list-bitcoin-exchange-traded-product-in-europe.

[95] Executive Order on the Safe, Secure and Trustworthy Development and Use of Artificial Intelligence: https://www.federalregister.gov/documents/2023/11/01/2023-24283/safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

[96] https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/.

Box 2
Hungarian investment funds' indirect crypto investments reached an all-time high

The indirect effects of the SEC's historic decision, described in sub-chapter 2.5, were also felt in the Hungarian markets and primarily affected indirect crypto-asset investments. To obtain an accurate picture of this, the MNB assessed the indirect exposures of Hungarian public investment funds to crypto-assets for the period from 1 January 2024 to 15 September 2025.

In contrast to the US approach, current European[97] and Hungarian regulations[98] – presumably for consumer protection reasons – do not currently allow crypto assets that are not financial instruments to be included in the portfolios of public Hungarian funds. However, the rules do not prohibit funds from gaining indirect exposure to such assets, as long as the "intermediary layer" is a financial instrument that meets the investment limits. Such instruments may include the US ETFs mentioned above. Thus, the MNB assessed and evaluated which funds held such assets during the period under review.

The MNB identified 20 funds that had one or more indirect crypto-asset investment[99] in their portfolio during the period. The net asset value of the exposures concerned reached a record high in the review period, doubling the January 2024 value to HUF 6.2 billion on 23 July 2024, before falling back to around HUF 4 billion in September due to market turbulence caused by the "Japanese micro-crisis".[100] Finally, from November 2024, the net asset value increased strongly due to favourable market developments and measures adopted by the new US administration. 2025 H1 saw strong growth. On several occasions during the half year, BTC reached its highest price ever *(all-time high).* The BTC exchange rate reached a high of USD 124,457.12 (HUF 42,179,762.5392) on 14 August 2025. The indirect crypto-asset exposure of Hungarian funds peaked for the first time at HUF 6.8 billion, on 22 May 2025. The value then fluctuated between HUF 6.7 billion and HUF 6.2 billion, before falling back to HUF 5.3 billion by the end of the half year. This can be explained by the fact that one of the funds with the largest indirect exposure reduced its investments by 82 percent from June 2025. The same fund then stepped up and by the end of the period had almost USD 3 billion in this exposure. By the end of the period, indirect crypto-asset investments by Hungarian funds had reached a record high of USD 9.9 billion. In the period, Hungarian investment funds held an average of approximately HUF 5.2 billion in indirect crypto-asset investments. For the funds concerned, the average proportion of indirect crypto-asset exposures within total investments was 1.38 percent,[101] with small variance. There was a strong positive correlation between the net asset value of the aggregate portfolios and the daily closing price of BTC denominated in Hungarian forints. This is in line with expectations, as due to BTC's current market dominance, the price fluctuations of the most significant crypto-assets – and thus the products based on them – are typically similar to those of BTC (Chart 30). When making investment decisions, the fund managers of the funds concerned presumably consider the BTC price as an indicator.

[97] Article 50 of Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations, and administrative provisions relating to undertakings for collective investment in transferable securities. See also question ID1100 in the questions and answers concerning the Irish central bank. https://www.centralbank.ie/docs/default-source/regulation/industry-market-sectors/funds/ucits/guidance/ucits-qa-39-edition.pdf?sfvrsn=9ceb991d_1.

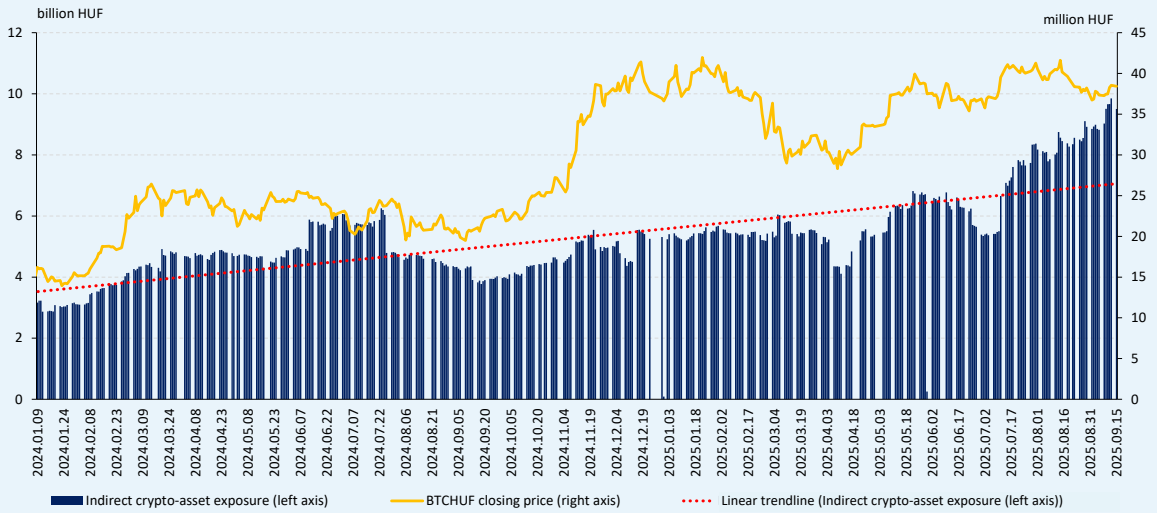
[98] Chapters II and IV of Government Decree 78/2014. (III. 14.) on the Investment and Borrowing Policies of Collective Investment Funds.

[99] This does not include investment fund shares of investment funds based in Hungary that had indirect exposure to crypto-assets.

[100] Sizemore, C.L. (2024): Japan's Stock Market Crash and Recovery: What Happened and What Investors Can Do. https://www.kiplinger.com/investing/stocks/japans-stock-market-crash-and-recovery-what-happened-and-what-investors-can-do.

[101] In four funds, crypto exposures reached 5 percent of daily net asset value, with one of these exceeding 8 percent on several occasions.

Chart 30
Net asset value of the indirect crypto asset exposures of the public investment funds examined



Note: During the assessment, the MNB, based on the regular disclosures of investment funds published on the kozzetetelek.mnb.hu website,[102] the ESMA database for financial instruments,[103] and the website of the Frankfurt Stock Exchange,[104] identified a total of 105 products that are indirectly linked to crypto-assets, or whose price or value is directly influenced by the crypto market. Subsequently, based on the daily net asset value fillings of the investment funds, the MNB checked which investment funds' portfolios contained the examined products, including the net asset value and quantity thereof, and finally, it aggregated the data and performed a time series analysis on it. The portfolios of certain Hungarian investment funds contain securities issued by other Hungarian investment funds that have indirect crypto investments. Such indirect investments had not been taken into account during the assessment. Supervisory data was available only on those workdays when net asset value of the individual funds had been calculated. Thus, the frequency may vary. The BTC exchange rate denominated in forints was calculated based on CoinMarketCap data and the MNB's USD/HUF mid-rate.

Source: MNB, CoinMarketCap

During the period, the net asset value of the five largest indirect crypto-asset investments accounted for an average of 83 percent of total exposures. The most important product was a collective investment security issued by a foreign fund, followed by BTC, ETH, or Solana-based assets, depending on the current market situation. The data shows that few domestic fund managers engaged in indirect crypto-asset investments, and market is fairly concentrated. Hungarian funds tend to seek exposure to crypto-assets by investing in funds managed by the aforementioned small group of fund managers.

In summary, it can be concluded that the indirect crypto-asset exposure of Hungarian public funds was relatively low, but grew steadily during the period. This is in line with international trends.[105] Investors have confidence in this type of investment, as it continues to offer them a fast, regulated and liquid way to invest in crypto-assets. Domestic investor confidence is boosted by the fact that the underlying assets of such instruments, crypto-assets, became regulated products in the European Union in 2024, thereby reducing the uncertainty surrounding them. Given the above, it is not inconceivable that more and more portfolio managers will turn their attention to crypto-assets in the future.

[102] One of the investment funds concerned qualifies as a UCITS, while the others are AIFs. The fund, classified as an UCITS, gained exposure to crypto-assets through shares.

[103] https://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_firds.

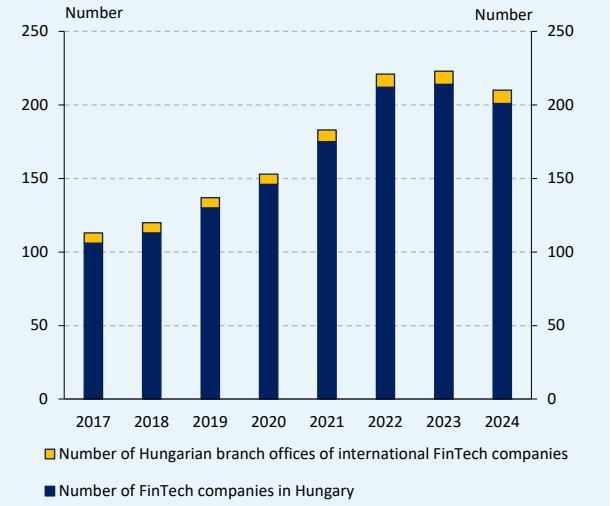
[104] https://www.boerse-frankfurt.de/en.

[105] Chainalysis (2024).

3. The Hungarian FinTech sector

After years of expansion, the Hungarian FinTech ecosystem showed signs of consolidation in 2024. The number of companies engaged in FinTech activities fell moderately, with 210 companies with Hungarian tax number operating in the sector. The sector's maturity is reflected in the declining share of micro and small enterprises, although nearly 80 percent of the sector's players still fall into these size categories. Financial software development, data analysis and business intelligence, and payment services continued to be the most popular service areas in the domestic FinTech sector, together covering approximately two thirds of the sector's companies. The total number of employees decreased moderately compared to 2023, but net sales revenue continued to grow, approaching the HUF 400 billion level. The share of profitable companies rose somewhat, indicating that profitable operation is becoming increasingly important for players in the sector. Firms engaged in export activities typically have higher sales revenues and are more profitable than companies that do not engage in significant export activities. The number of venture capital transactions dropped significantly compared to previous years. The average number of employees of firms that received venture capital in the first seven years of their life cycle is steadily and increasingly higher than that of similar firms that did not receive venture capital from the second year onwards. Profitable operation is less of a priority for financed firms, and accordingly, the share of profitable firms lags significantly behind that of the non-financed group; the rapid growth of the former may be positively influenced by increasing exports of services over the years.

Chart 31
Changes in the number of companies and branch offices with active FinTech activities in Hungary



Source: NTCA, MNB

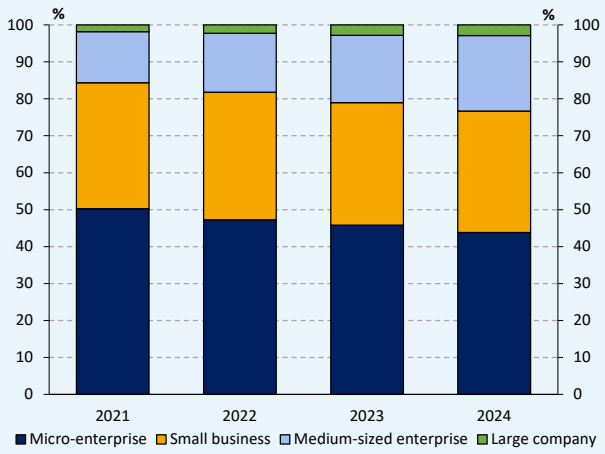
3.1. ANALYSIS OF THE HUNGARIAN FINTECH SECTOR BY COMPANY SIZE AND NUMBER OF EMPLOYEES

After dynamic growth in recent years, the domestic FinTech sector is increasingly showing signs of consolidation.

In 2024, a total of 210 companies engaged in FinTech activities[106] operated in Hungary (Chart 31). In the preceding period, there was a growth trend in the number of companies in the sector, but – similar to the global FinTech market – investor interest in the sector declined in Hungary as well. The less favourable macroeconomic situation and higher interest rates may also pose challenges for the sector. In the last two years, the number of newly founded companies decreased, and a number of companies exited the market or ceased their activities. Overall, the moderate decrease in the number of FinTech firms is related to domestic and international market developments.

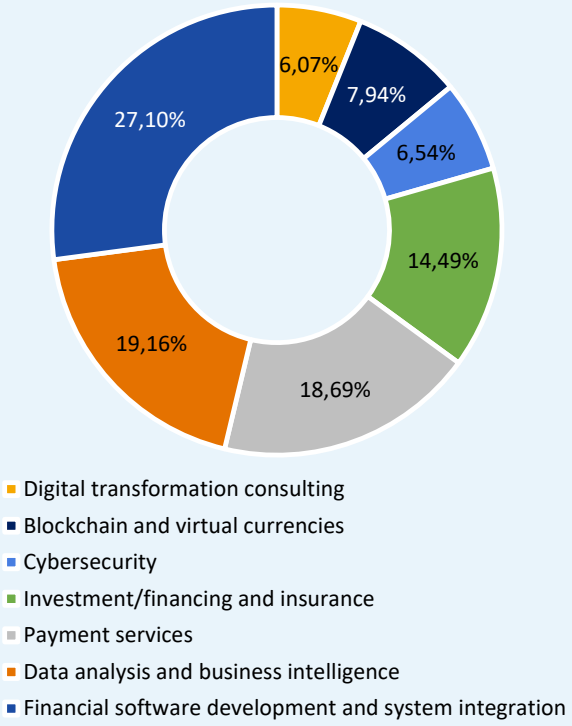
[106] In our analysis, the domestic FinTech sector refers only to enterprises with a Hungarian tax number, operating as a company and active in 2024. For details on the identification methodology, see the MNB FinTech and Digitalisation Report 2020, Box 3.

Chart 32
Breakdown of FinTech companies by company size



Source: NTCA, MNB

Chart 33
Distribution of the number of FinTech companies by service area



Source: NTCA, MNB

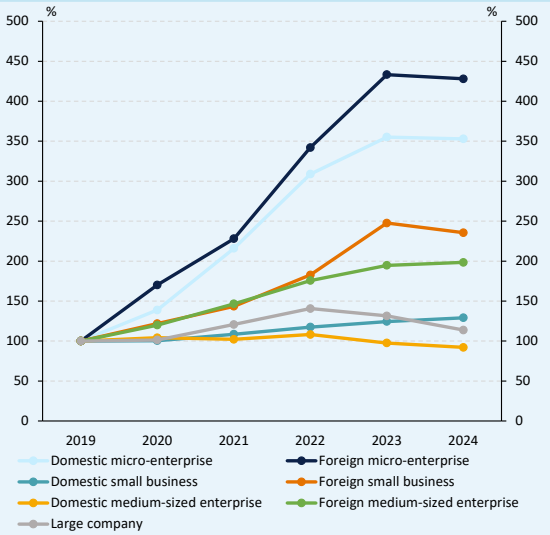
Although micro and small enterprises continue to dominate the domestic FinTech ecosystem, their share has been declining in recent years.[107] Compared to the data presented in last year's report, there was a moderate change in the size distribution of the sector, as the share of micro enterprises continued to fall, while the share of medium-sized enterprises increased (Chart 32). This is linked to the fact that the companies that ceased their activities have typically been in the smaller size categories, and to the fact that, while over the years, several firms moved into the higher size categories, the pace of new FinTech start-ups slowed down significantly. However, medium-sized and large enterprises still account for less than one-quarter of the sector.

Foreign ownership background remains prevalent, especially for larger FinTech companies. Overall, the share of domestically-owned enterprises has increased modestly in recent years: while the vast majority of micro enterprises are Hungarian-owned, this is true for three-quarters of small enterprises and roughly one-half of medium-sized enterprises.

Almost two-thirds of companies in the FinTech sector in Hungary are active in three service areas, which are proving to be consistently popular. For years, three service lines have covered the majority of the companies in the sector, of which the share of companies in the financial software development segment has grown significantly, indicating that serving the development needs of domestic financial enterprises is a key business priority for the domestic FinTech sector (Chart 33). The share of micro and small enterprises in the sector increased slightly in the investment/finance and insurance segments, but financial software development services are still the most popular, which shows that domestic FinTech companies often act as partners and suppliers to the traditional financial sector. Micro and small enterprises also include the full range of companies involved in blockchain and virtual currencies. By contrast, medium-sized FinTech firms are over-represented in cybersecurity and payment solutions services.

[107] FinTech companies are classified by size according to Act XXXIV of 2004 (SME Act).

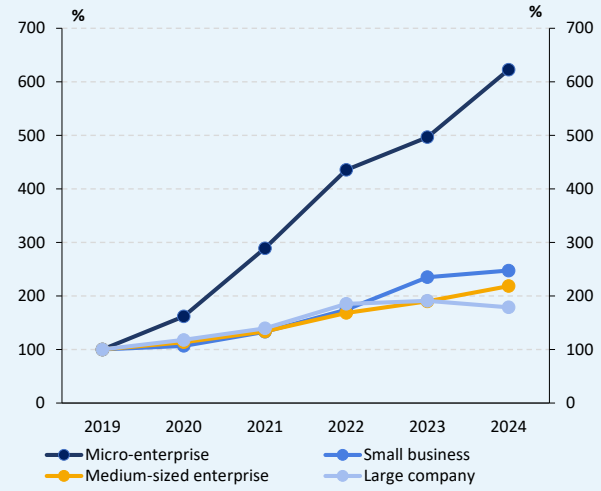
Chart 34
Trends in the number of employees by company size and ownership background (2019=100 percent)



Note: The data shown represent the annual average for each year. The size of the enterprises was determined based on their size in 2019 (if the first appearance was later, the classification from that initial year was used).

Source: NTCA, MNB

Chart 35
Revenue of the FinTech sector by company size (2019=100 percent)



Note: The data shown originate from the aggregated data of companies of the respective size; the size of the enterprises was determined based on their size in 2019 (if their first appearance was later, the classification from that initial year was used).

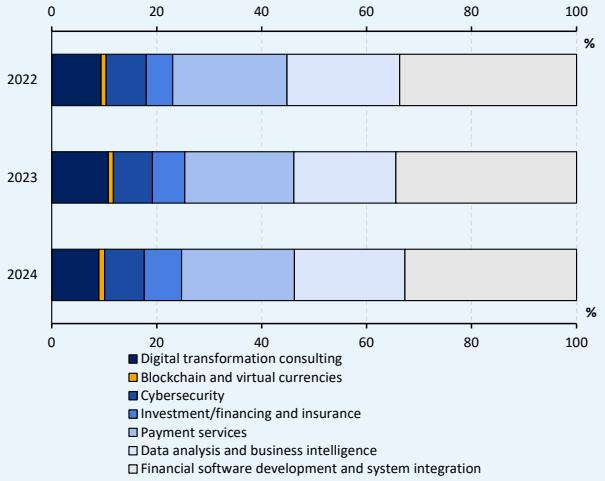
Source: NTCA, MNB

The number of employees in the FinTech sector in Hungary remained stable in 2024, with almost 9,000 people employed by such companies. In recent years, micro and small enterprises have been able to increase their number of employees, which can be explained by the fact that these firms have a higher growth potential, with the number of employees increasing by 500 since 2022 (Chart 34). By contrast, over the past two years, medium-sized and large enterprises with domestic ownership reduced their workforce overall. Foreign-owned FinTech firms employed around 60 percent of the sector's workforce in 2024, reflecting the over-representation of larger enterprises. In 2024, only ten firms accounted for around one-half of the total number of employees; accordingly, the business policy choices of these firms have a significant impact on aggregate employment figures. In 2024, even after a moderate decline, nearly two-thirds of the sector's employees worked for a company involved in data analysis or financial software development. The number of employees in payment services companies increased significantly in recent years: 34 percent more people were working for such companies in 2024 than in 2022.

3.2. SALES REVENUE AND PROFITABILITY OF THE HUNGARIAN FINTECH SECTOR

In 2024, the domestic FinTech sector's sales revenue was close to HUF 400 billion, reflecting a nearly three-fold increase over five years. Even in the adverse macroeconomic conditions of recent years, the sector was able to expand its turnover, but the growth rate slowed down in 2023 and 2024 (Chart 35). A significant contribution to the increase was made by companies that were considered micro-enterprises in 2019 (or were classified in this size category if they started later): while these accounted for only 5 percent of the sector's total revenue in 2019, their share had risen to over 13 percent by 2024. In particular, this is due to companies that were able to grow in size over the past five years: 23 percent of micro enterprises and 5 percent of medium-sized enterprises that were continuously operating between 2019 and 2024 became small and medium-sized enterprises, respectively. The share of firms with turnover above HUF 1 billion also increased: By 2024, more than 35 percent of companies had reached this level, which may also indicate that some players in the market are entering a mature stage. In recent years, foreign-owned enterprises have been able to increase their sales revenue more dynamically, but this trend seems to be reversing: domestically owned micro, small and medium-sized enterprises increased their turnover by 18 percent from 2023 to 2024, while foreign-owned enterprises increased their sales revenue by only 8 percent.

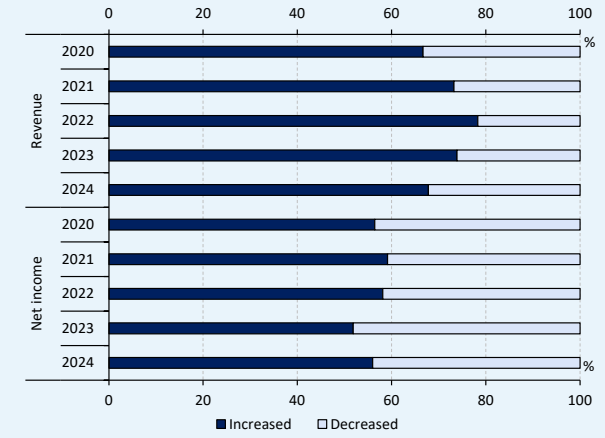
Chart 36
Trends in the revenue of the FinTech sector's service areas



Note: The data shown relate to micro, small, and medium-sized enterprises.

Source: NTCA, MNB

Chart 37
Distribution of the number of FinTech companies based on year-on-year change in revenue and after-tax profit



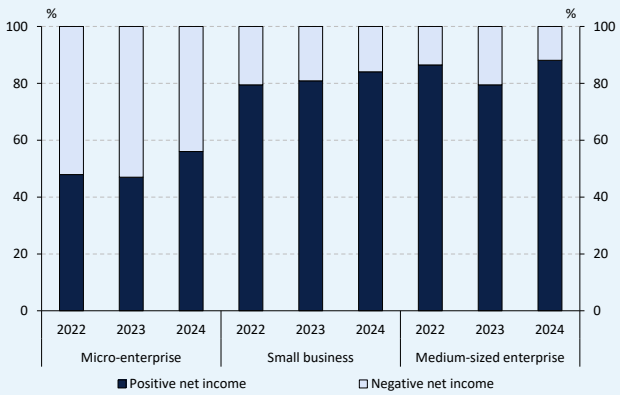
Source: NTCA, MNB

Three services account for about three-quarters of the total sales revenue of the Hungarian FinTech sector. Financial software development, data analytics and payment services firms, which are also the most popular in terms of the number of firms, accounted for the bulk of the sector's turnover in 2024 (Chart 36). Digital consultancy services are considered to be relatively over-represented in terms of the share of sales revenue, but this is due to the prominence of one company. Investment/financing and insurance firms have been able to almost double their sales revenue since 2022, indicating the potential in this segment. The area of blockchain and virtual currencies is of little economic importance.

The growing sales revenue is being felt in a smaller and smaller part of the sector, and increasing profit after tax is also a challenge (Chart 37). More than 40 percent of micro enterprises saw their sales revenue fall in 2024 compared to 2023, while for medium-sized enterprises the share was below 20 percent. It can therefore be assumed that the larger players in the market have proven to be more resilient to the turbulent macroeconomic situation in recent years. This idea is reinforced by the fact that in 2024, more than one-half of micro enterprises reduced their expenditure compared to 2023, which could hamper their growth, as three-quarters of firms with declining sales revenue also reduced their expenditure. Looking at the individual service areas, it can be seen that more than 75 percent of companies operating in the segments of investment services, payment services and data analysis reported an increase in revenue, while the majority of FinTech companies dealing with blockchain and virtual payment instruments reported declining revenues.

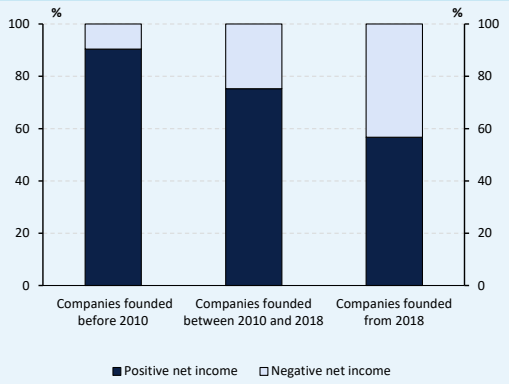
The rising share of profitable companies illustrates that, on the one hand, domestic FinTech firms are increasingly capable of generating profits and, on the other hand, that this may increasingly be expected by owners. Looking at profit after tax, it can be seen that 73 percent of companies were profitable in 2024, which means that the trend of declining profitability among companies appears to be coming to a halt, possibly indicating consolidation in the sector. In 2024, the share of profitable enterprises increased in several size categories (Chart 38). Medium-sized enterprises accounted for 50 percent of the sector's profit after tax, while small enterprises were responsible for 10 percent of total profit after tax. At the same time, the increase in the profitability of micro enterprises was supported by the fact that several persistently loss-making micro enterprises suspended their activities. The shift towards profitability was

Chart 38
Distribution of profitable and loss-making companies in the Hungarian FinTech sector by size



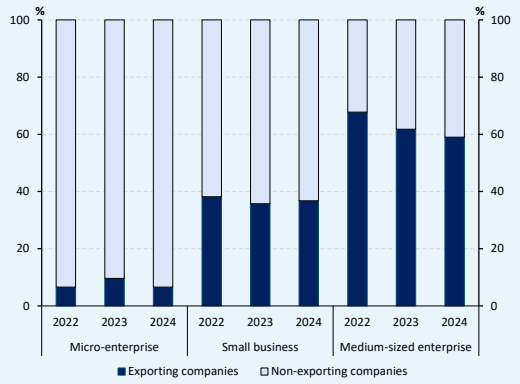
Source: NTCA, MNB

Chart 39
Distribution of profitable and loss-making companies in the Hungarian FinTech sector by founding year/period



Source: NTCA, MNB

Chart 40
Distribution of the number of exporting and non-exporting companies in the Hungarian FinTech sector by size



Source: NTCA, MNB

particularly pronounced in investment/finance and insurance and data analytics services, with the share of profitable firms increasing by 12 percentage points in the former and 16 percentage points in the latter compared to 2023. The age of firms is also related to their profitability, as at the beginning of their life cycle, especially if they have access to venture capital, there is typically no owner expectation to achieve profitability, with the focus being on acquiring new clients and developing innovative products. This is illustrated by the fact that in 2024 there was a difference of almost 30 percentage points between the profitability rates of firms at different stages of their life cycle (Chart 39).

3.3. IMPACT OF EXPORTS IN THE HUNGARIAN FINTECH SECTOR

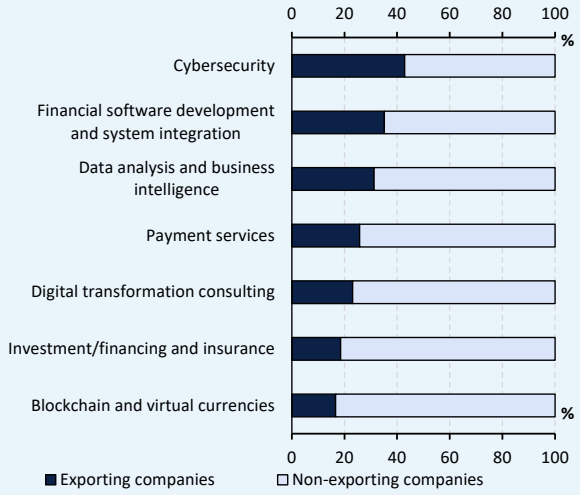
Service exports are of particular importance for the domestic FinTech sector. In light of the relatively small size of the domestic market, offering solutions to foreign users by domestic FinTech companies may represent a greater growth opportunity. Exports can help to rapidly scale up sales revenue, achieve economies of scale and increase firms' productivity. Geographical diversification of the client base can also help to increase companies' resilience to domestic macroeconomic turbulence. The importance of exports for the domestic FinTech sector is shown by the fact that 44 percent of the total sales revenue of micro, small and medium-sized enterprises in 2024 came from exports, which is approximately three times the ratio of total export revenue to total turnover for companies of a similar size in the traditional domestic corporate sector.[108]

Almost 30 percent of domestic FinTech firms are already exporting;[109] and the size, ownership and range of services provided by companies may also be related to whether they export. In 2024, less than 10 percent of micro enterprises were present in foreign markets, compared to 60 percent of medium-sized enterprises (Chart 40). This is not surprising, as early-stage firms find it more difficult to enter foreign markets due to their size, and the owners' priority is not necessarily to acquire export markets. At the same time, exporting can help an enterprise to grow. This is evidenced by the fact that exporting companies were over-represented among the FinTech companies that advanced in the size category in the period 2019–2024. For years, the dominant trend has been that the role of exports is emphasised in the case of foreign-owned firms, with more than 70 percent of these firms exporting, compared to only 17 percent of domestically-owned FinTech firms. This may be explained by the fact that the foreign

[108] The calculation is based on the 2023 data of the HCSO statistics on *Business Performance Indicators for Small and Medium-sized Enterprises*.

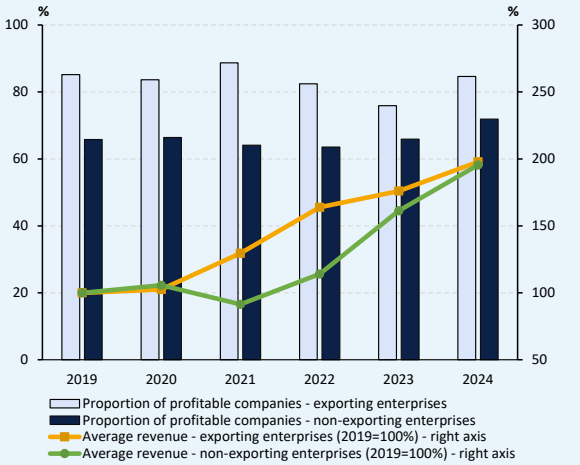
[109] In this report, we refer to companies whose export sales accounted for more than 10 percent of their total sales revenue as exporting companies. Branches and large enterprises do not appear among the firms examined in this sub-chapter.

Chart 41
Distribution of exporting and non-exporting companies in the Hungarian FinTech sector by service area



Source: NTCA, MNB

Chart 42
Average revenue and distribution of profitability in the domestic FinTech sector – categorised by export activity



Source: NTCA, MNB

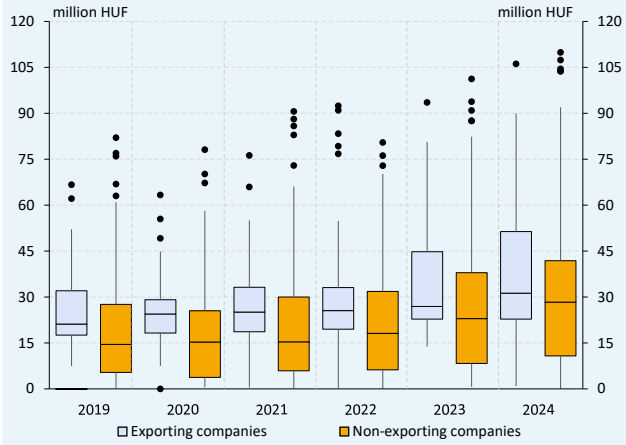
ownership group is building its business model for the foreign market, but it may also be the case that the decision to enter the foreign market is driven by the foreign investors behind an existing domestic company. Typically, the share of exporting firms in each service sector ranged between 15 and 45 percent, with firms engaged in cybersecurity and financial software development being the most export-oriented (Chart 41). Unsurprisingly, it was firms in the blockchain, which is mostly made up of micro enterprises, and investment services that exported the smallest share of their services in 2024.

A higher proportion of exporting FinTech companies were profitable and had higher revenues. The turnover of exporting companies in 2024 was almost three times that of non-exporting companies, which may be partly explained by differences in size. However, it is striking that the turnover of the group of exporting firms has grown more dynamically in recent years than that of non-exporting firms (Chart 42). Scalability and economies of scale may also be reflected in the fact that a higher share of exporting companies were profitable during the examined period, but this difference has narrowed over the last two years. While the differences between the two groups may be partly explained by the emergence of new firms, which tend to be less ambitious to achieve profitability in the early stages of their life cycle, it is striking that it is not the companies founded before 2010 which are the most profitable, but those founded between 2010 and 2018 that are the most active in exporting. This can be explained by the fact that in their case, innovation-based operations based on presence in international/regional markets may be more typical, which contrasts with the more traditional operations of SMEs already established in the domestic market.

Service exporters in the FinTech sector can operate more efficiently. In 2019, exporting companies already typically had more revenue per employee, and this value has increased more dynamically over the years (Chart 43). This is true even though the share of personnel costs is significantly higher for exporting companies[110] – on average 15 percentage points higher than for non-exporting firms.

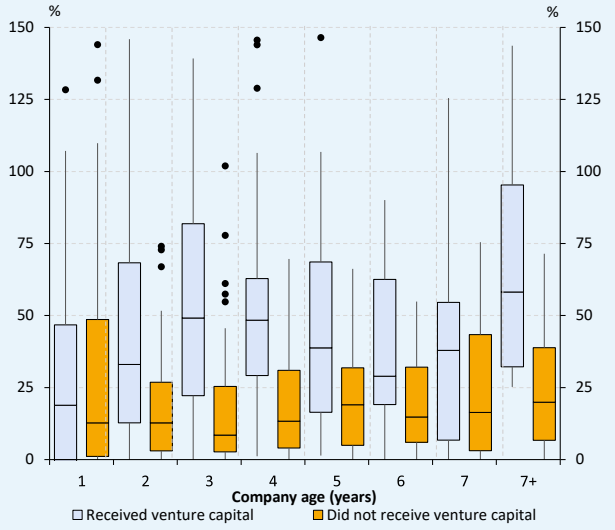
[110] Ratio of personnel costs to total costs (material costs + personnel costs + depreciation + other costs)

Chart 43
Revenue per employee of exporting and non-exporting FinTech companies



Source: NTCA, MNB

Chart 44
FinTech companies' personnel costs as a proportion of revenue, by company age and venture capital investment



Source: NTCA, MNB

This, combined with the fact that exporting companies have a higher, more dynamic growth in value added,[111] may indicate that they are able to use their resources more efficiently.

3.4. VENTURE CAPITAL INVESTMENT IN THE HUNGARIAN FINTECH SECTOR

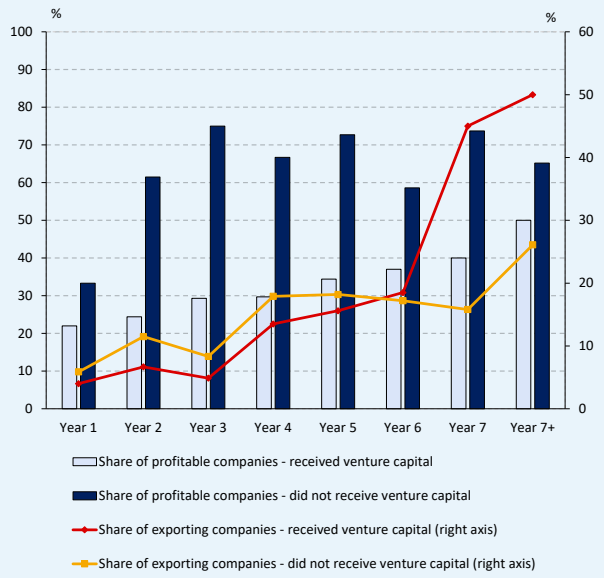
Between 2017 and 2021, the number of venture capital transactions in the domestic FinTech sector was steady at 15–17 transactions per year, decreasing to 7 in 2022 and 3 each in 2023 and 2024. The significant decrease registered is in line with the statistics published by HVCA,[112] which show that the number of transactions in the Hungarian ICT sector gradually fell from 75 in 2021 to 41 in 2023, and further decreased to 10 in 2024. The increase in the number of venture capital investments may be hampered by a decline in the appetite for starting new businesses and a decline in risk-taking, which can be observed globally from 2023. In addition, the decreasing number of non-financed FinTech companies is a barrier to raising venture capital. 45 percent of domestically-owned companies founded after 2013 received at least one round of venture capital financing in the first seven years of their life cycle, typically in the earliest stages of their life cycle.

Experience so far shows that among FinTech companies headquartered in Hungary, the ones that raised venture capital typically grow faster – especially in terms of headcount – than those that did not receive such financing in the first few years of their life cycle. Venture capital makes a positive contribution to the realisation of the business goal of companies with ambitious growth plans, with the absolute priority of achieving rapid company size growth.

Companies receiving venture capital financing use labour more intensively in the first six years of their life cycle, which is reflected in more dynamic growth in the number of employees (Chart 44). They have substantially higher labour costs relative to sales revenue from the second year until the sixth year. This is also reflected in the evolution of the number of employees: the average difference between the two groups increases from one to ten in the first six years, to the benefit of the companies receiving venture capital.

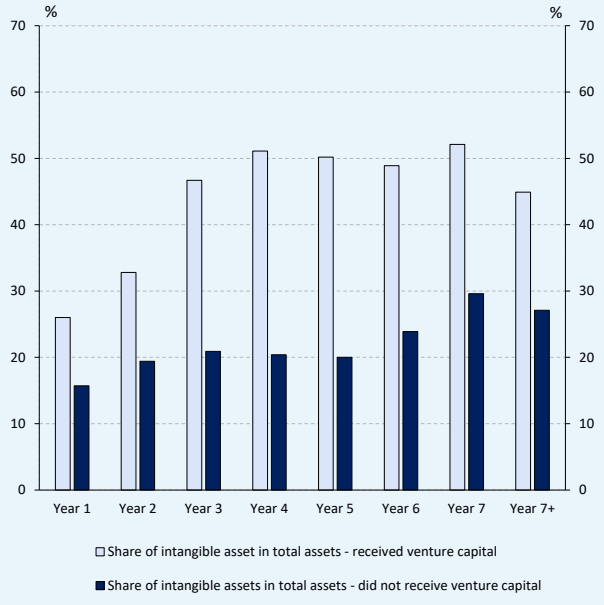
[111] Value added of businesses is calculated on the basis of the sum of the companies' profit after tax, personnel costs and depreciation.
[112] HVCA Investment Monitoring Report FY 2024 – Statistics – HVCA – Hungarian Venture Capital and Private Equity Association.

Chart 45
Share of profitable FinTech companies (left axis) and exporters (right axis) depending on venture capital investment



Source: NTCA, MNB

Chart 46
Proportion of intangible assets within total assets depending on company age and venture capital financing



Source: NTCA, MNB

In line with similar findings in previous years' FinTech and Digitalisation Reports, **there is a significant difference in profitability in the early stages of their life cycle**. This is because venture capital is willing to finance losses in order to achieve economies of scale as quickly as possible (Chart 45). Venture capital-backed companies have more employees in the early stages of their life cycle than non-financed companies, compared to both loss-making and profitable groups at the operating level. Moreover, profitable companies grow substantially faster in terms of the number of employees than (consistently) loss-making ones.

In the equity-financed group, the share of service-exporting companies in the first five years of their life cycle lags behind the share of companies without venture capital financing by an average of five percentage points. From year six onwards, equity-financed companies are more likely to sell abroad. This confirms that expansion in international/regional markets can contribute to a faster scaling up of activity volumes, mostly after 3–4 years of operation (Chart 45).

Another important distinction can be made between FinTech firms with venture capital financing and without venture capital financing in terms of the quality of the capital stock. The role of intangible capital stock in growth is increasingly appreciating, as its stock has a crucial impact on the value-added process of the company.[113] There is a large difference between the reported value of intangible assets on the balance sheet according to the presence of venture capital financing (Chart 46). Companies that received venture capital in the first six years of their life cycle systematically show a higher proportion of intangible assets as a ratio of total assets than those that did not receive venture capital. This may be partly related to the fact that investors expect to see on the balance sheet an item that can represent a significant comparative or competitive advantage, on which they also base the ambitious growth potential of the financed company.[114] Firms with intangible assets accounting for at least 50 percent of their total assets are typically half as likely to be profitable in the early stages of their life cycle as those with a ratio below 50 percent. These are typically venture capital-backed start-ups with high growth potential.

[113] In addition to research and development or patents, intangible capital goods may include know-how, software, brands, databases, confidential information or even client and supplier relationships. The value shown under intangible assets in the balance sheet captures the "real" amount of intangible capital.

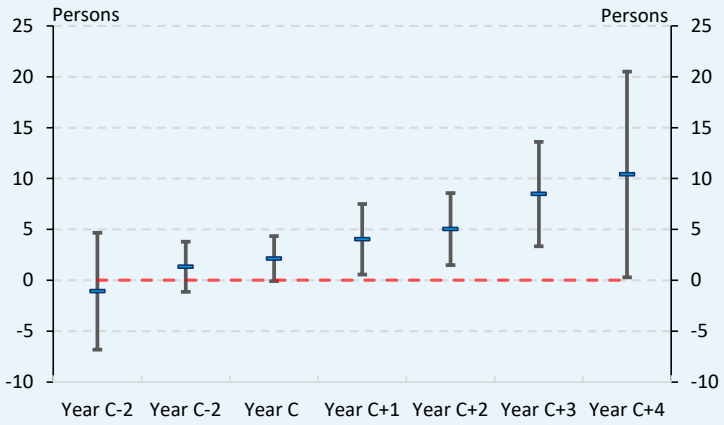
[114] There is a tendency for companies established later in time to show a smaller proportion of tangible or intangible assets on their balance sheets (e.g. computing or storage capacity can be leased), which may affect the ratio of intangible assets to total assets.

Box 3
Impact assessment of the growth trajectory of venture capital-backed firms

Our ex-post impact assessment aims to estimate the average effect of venture capital financing as an intervention on the growth trajectory of FinTech firms compared to firms that are not financed in this way. We use a *diff-in-diff* approach in a regression estimation framework, where we can take into account the different timing of the financing and observe the treated and control groups over several time periods (for details on the methodology, see Callaway – Sant'Anna 2021).[115] Looking at the group of FinTech firms founded after 2011, 50 out of 121 firms in our sample received equity financing at least once in the period 2012–2024.[116] We consider a firm as "treated" from the calendar year in which it received its first equity financing.

The average treatment effect (venture capital injection) in the first four years after the equity financing is 4–5 employees (Chart 47), i.e. the increase in the number of employees associated with venture capital financing for firms that have received venture capital compared to firms that have not (yet) received venture capital. The positive impact of venture capital is most significant in the calendar years 2017 to 2020 and for firms that received equity financing in the period 2016–2018, when venture capital activity was at its peak. If we look at personnel expenditure, we obtain a similar result, i.e. firms receiving venture capital have a more dynamic increase in personnel expenditure as a share of net sales revenue in the years following the venture capital transaction.

Chart 47
Average change in the number of employees in the period before and after first capital financing (year C)



Note: The chart shows the 95 percent confidence intervals for the point estimates.
Source: MNB, NTCA

[115] Callaway, B. – Sant'Anna, P.H. (2021): Difference-in-differences with multiple time periods. Journal of Econometrics, 225(2), 200-230.
[116] Regression estimation is performed on unbalanced panel data with 658 observations.

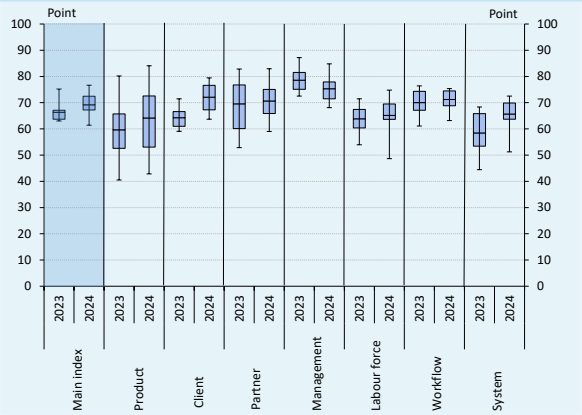
4. Digitalisation level of the Hungarian banking system

According to the results of the MNB's digitalisation survey, which covers more than 90 percent of the Hungarian banking system in terms of total assets, the digital maturity of domestic banks has continued to improve compared to previous years, and the surveyed institutions have started to move into a more advanced stage of digital transformation. Compared to the previous year, there has been a notable increase in the digitalisation of communication with clients and systems, with the former indicating stronger emphasis on digital information by banks, resulting in a significant increase in the proportion of electronic notifications related to credit debt. Improving hardware and software infrastructure is also a priority, and domestic banks have made progress in reducing paper documentation for several product lines. One of the benefits of digitalisation on the product side is that institutions have achieved revenue growth through digital sales channels. There was a moderate improvement in partner contacts, with institutions showing an increasing interest in collaborating with FinTech firms. No significant improvement has been seen in the digitalisation of workplace culture and internal processes, but there has been a progressive increase in the use of artificial intelligence. In 2024, among the areas surveyed, the only area to show a decline was in management commitment to digitalisation, which can be explained primarily by stricter expectations regarding artificial intelligence.

Chart 48
Digital maturity index of the domestic banking system

Source: MNB

Chart 49
Evolution of the scores by pillars and the total points of the digitalisation development index of the domestic banking system



Note: The chart shows the minimum, maximum, lower quartile, upper quartile and average values.

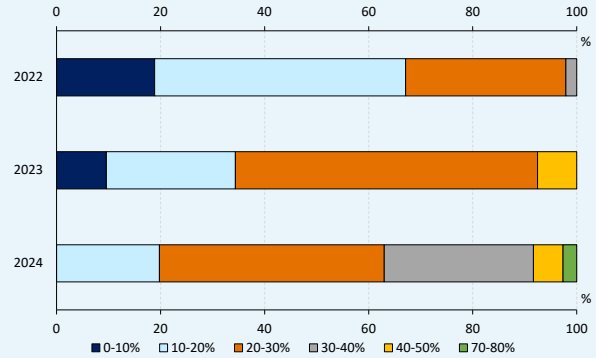
Source: MNB

4.1. DIGITALISATION OF THE HUNGARIAN BANKING SYSTEM

According to the MNB's survey, the digital maturity of the domestic banking system continued to improve in 2024, maintaining the pace of development of previous years. In 2024, the MNB assessed the digital maturity of the domestic banking system for the sixth time, based on seven main pillars (clients, products, partners, management, labour force, workflow and systems) (Chart 48). The annual survey, which covers more than 90 percent of the domestic banking sector in terms of total assets, contained nearly 200 questions, most of which remain unchanged, while some parts of the questionnaire were updated this year in line with digitalisation trends.

Banks' digital maturity is gradually improving, although this year saw a moderate improvement for the sector as a whole, with some institutions moving out of the medium maturity range (between 50 and 75 points) into a more advanced stage of digital transformation. Underpinning this development is the development of an organisational culture that is supportive of digitalisation. In 2024, the average composite index reached 69, three points higher than last year's score of 66, reflecting the banking sector's achievements in digitalisation (Chart 49). Looking at the main index covering the level of digitalisation of overall operations, it is encouraging that the maximum score has increased, with the upper quartile at 67 points in 2023, while in 2024 this value already appeared at the lower quartile level. This suggests that institutions that were previously lagging behind have started to catch up, but the digital maturity gap between banks remains.

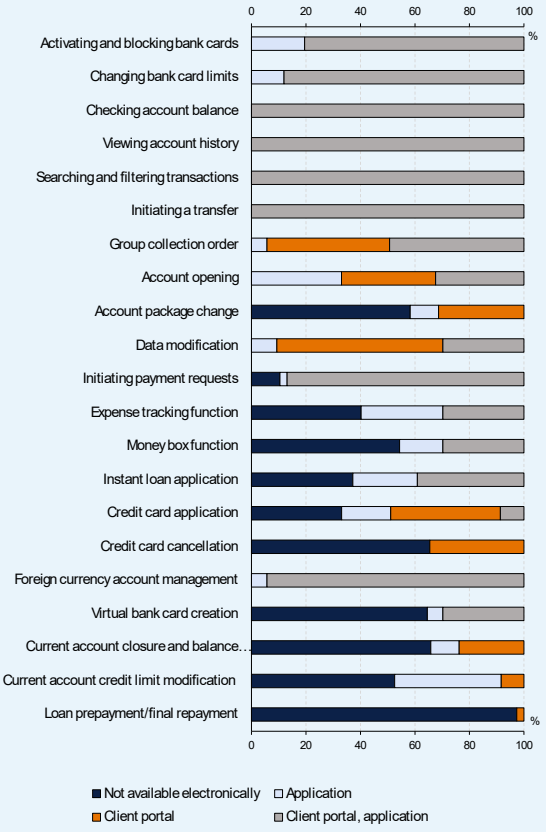
Chart 50
Share of revenue from digital product sales compared to total product sales



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Chart 51
Digitally available functions on various bank electronic interfaces



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

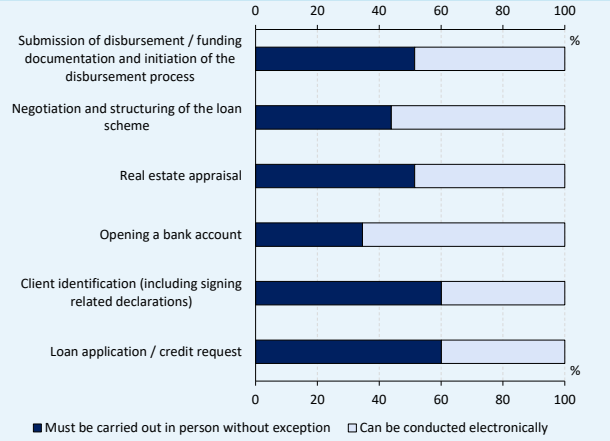
Looking at the individual pillars, it can be seen that the average level of development has increased in all but one pillar, but there are also regressions in the minimum and maximum values, due to increasing digitalisation expectations.

Looking at the individual pillars, progress was made again this year in most pillars. The biggest improvement can be seen in the client pillar, which also contributed significantly to the increase in the main index. In addition, the product pillar also evolved, as illustrated by the growing number of banks reporting an increase in the share of revenues from digital product sales, but with significant differences in the range of services available across banks' digital platforms. The system pillar score also increased, with some product areas making progress in replacing paper with digital. There was a moderate improvement in the partner pillar, as banks are more open to working with FinTech players and increasingly adopting FinTech solutions compared to 2023. The client pillar score also continued to increase, as banks placed more emphasis on digital information, with a significant increase in the share of notifications about credit debt, and became more active in the online space and social media. For the workflow pillar, the score increased moderately compared to 2023, as the full digitalisation of back-end systems – in particular the automatically updated registers – is already in place for several registers. The labour force pillar also saw a moderate improvement, with AI and process automation now featuring much more prominently in employees' training opportunities. By contrast, the score for the management pillar decreased, as factors such as the existence of a dedicated AI strategy, the establishment of an AI coordination body or the appointment of a Chief AI Officer are now less common. As the majority of responding institutions reported shortcomings in these areas, the results suggest that there is room for improvement, as reflected in the decrease in the score for the management pillar.

4.2. DIGITALISATION OF INTERACTIONS WITH EXTERNAL STAKEHOLDERS

Five of the eight banks surveyed in 2024 reported an increase in the share of digital product sales revenue as a percentage of total product sales compared to 2023. There is an observable trend at the international level that digital sales channels are coming to the fore in the banking sector, and digital product sales are also becoming more and more important in the revenues of domestic banks (Chart 50).

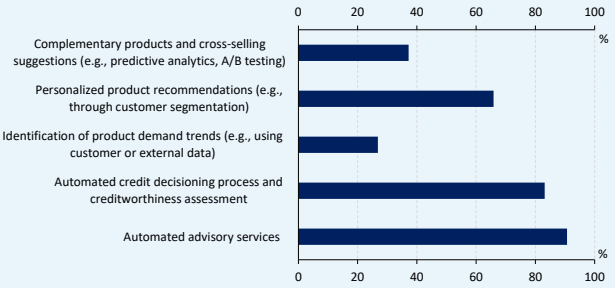
Chart 52
Procedures related to mortgage loan applications for residential purposes, which can be conducted either in person or electronically



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Chart 53
Artificial intelligence solutions related to product sales



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

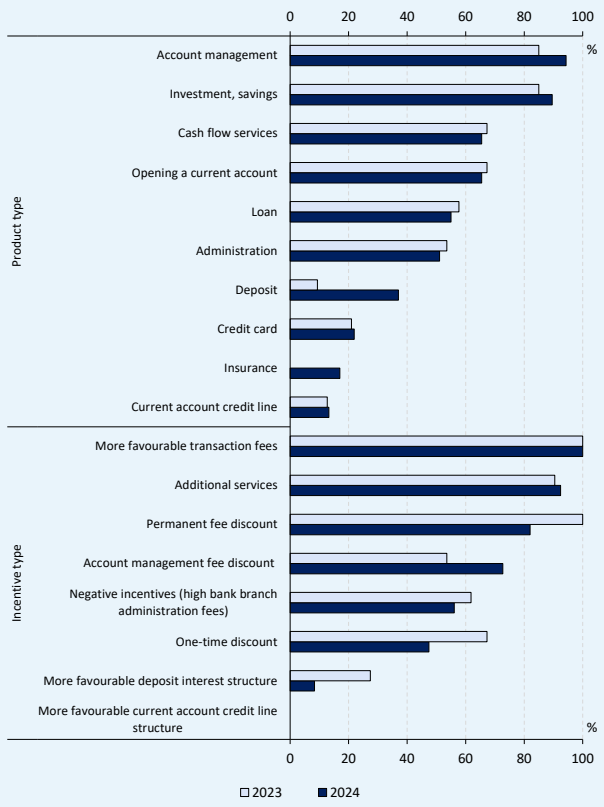
This is partly explained by the increasing range of products available to clients on banks' digital platforms; for example, overdraft applications are more widely available compared to 2023. In parallel, clients are also increasingly open to conducting their banking online. Digitalising different processes can speed up the use of certain products, improve the customer experience and increase the efficiency of the banking system.

Although most core services are available on the digital platforms of domestic banks, the development of features with less business potential for financial institutions is slower. Functions can be identified that would be in demand from the client side, but were not available in 2024 or were available only to a limited extent. These functions can be broken down into three broad areas: more complex product sales (e.g. applying for corporate loan products or taking out mortgage loans for housing), client support functions, and closing banking relationships (e.g. closing current accounts, terminating credit cards). Functions that help clients track their spending and savings are convenient for them. FinTech players were pioneers in the widespread adoption of such client support functions, but by 2024, several domestic banks' clients already had access to piggy bank or expense tracking functions (Chart 51). The biggest challenge may be to digitalise the sale of more complex financial products. Although the digitalisation of the sub-processes related to the application for investment and working capital loans has improved, legal obstacles prevent these transactions from being fully online. The digitalisation of corporate banking can be hampered by a diverse client base, which often prefers face-to-face transactions, and the difficulty of scaling the products they use. The digitalisation of housing loan applications rather than corporate lending could be a priority for banks. Among the sub-processes of applying for housing loans, the digital signature of contracts is the one that has not yet been solved, mainly due to legal requirements[117] (Chart 52).

Artificial intelligence also plays a role in the expansion and development of banks' digital product offerings. Following international trends, domestic financial institutions have also taken steps to implement AI solutions. Almost all institutions – currently typically at an experimental level –already use artificial intelligence to support their product sales activities (Chart 53).

[117] Section 13 of Act CLXII of 2009 on Consumer Credit

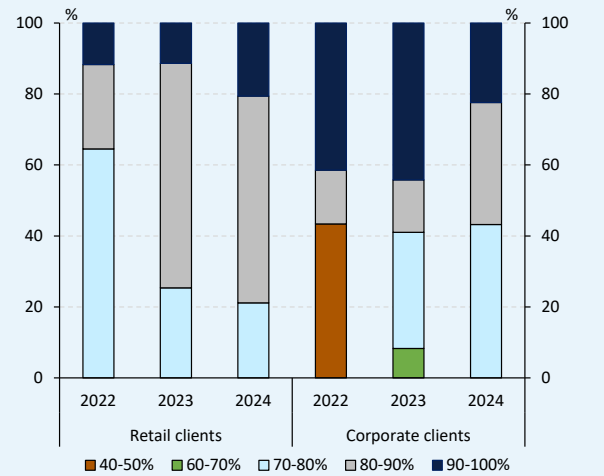
Chart 54
Pricing and other incentives for various digital banking products and services



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Chart 55
The proportion of retail and corporate banking clients receiving monthly bank statements electronically



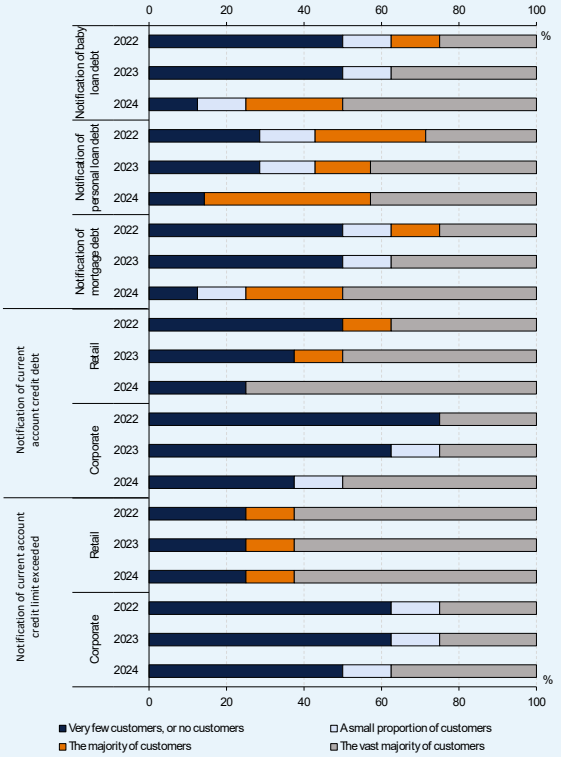
Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Banks maintain an extensive incentive scheme to promote digital product and service sales. In particular, credit institutions try to encourage their clients to use digital platforms by offering discounts and additional services (Chart 54). At the same time, commercial banks are aware of the need to further strengthen their digital channels to increase clients' knowledge of how to use them; accordingly, they are all publishing training videos, guides and other support materials to help them navigate their digital interfaces. Security is also important across different channels, as is creating a sense of security, given that there have been numerous cases of fraud targeting bank clients in recent years, which justifies strengthening trust in digital platforms.

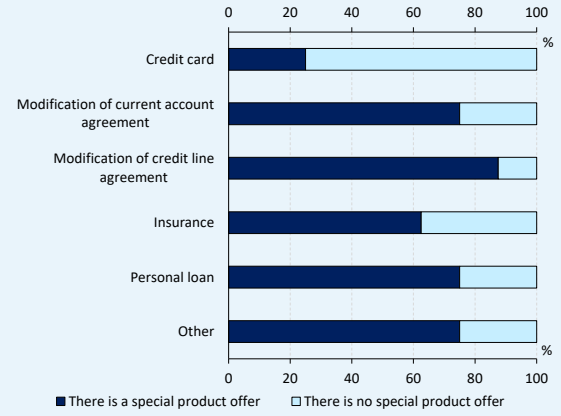
The share of household and corporate clients receiving monthly bank statements in electronic form is broadly similar to 2023. While banks were successful in shifting their clients towards electronic notifications in previous years, this trend stalled in 2024, albeit at a high level (Chart 55). However, the 2024 results do not mean that banks are no longer prioritising the promotion of digital bank statements; rather, the change can be explained by the fact that digitally receptive client groups have already been attracted to electronic bank statements in recent years. The remaining clients prefer paper-based solutions, which may slow further digitalisation efforts in this area in the future.

Chart 56
Percentage of bank clients who receive notifications about their loans in digital form



Note: Weighting in proportion of respondents.
Source: MNB

Chart 57
Customised product offers based on client data in various product categories at individual banks

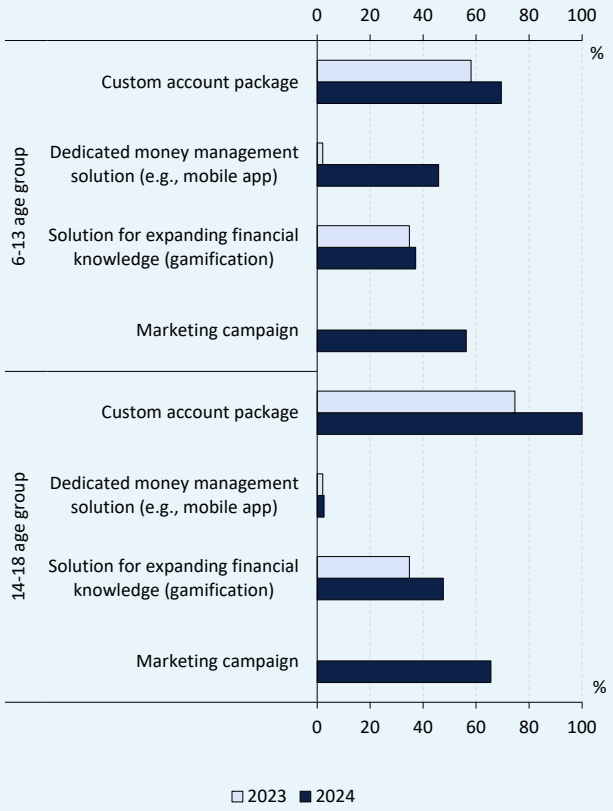


Note: Weighting in proportion of respondents.
Source: MNB

The Hungarian banking sector has significantly increased the share of digital notifications related to credit debt. Several institutions were able to dramatically increase the level of digitalisation of their notifications for each loan product from 2023 to 2024, which had a significant impact on the sector's development in the client pillar (Chart 56). As many bank clients have a smart device, receiving their bank statement electronically is a quick and easy option for them. For banks, in addition to cost efficiency, the shift to electronic channels for formal client communication is also important because it can fit into their wider digital communication plans.

Internationally, the banking system is also moving towards personalised client communication, and accordingly, domestic players are also processing a lot of customer data for targeted inquiries. In addition to customers' transaction data, most banks also use their activity and demographic characteristics, for example, to create personalised offers for their clients, and most banks use the incoming data to offer special product offers to their clients. Offers related to credit cards and personal loans are popular, but most banks also have special product offers linked to the data they collect in the case of insurance. (Chart 57).

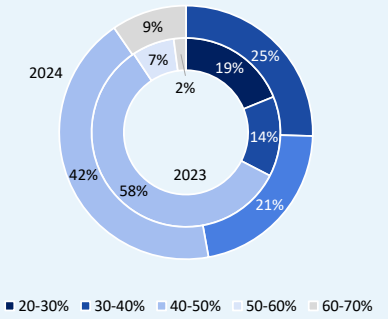
Chart 58
Solutions supporting financial awareness and integration among young people



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Chart 59
Online banking marketing budgets in proportion to the total marketing budget



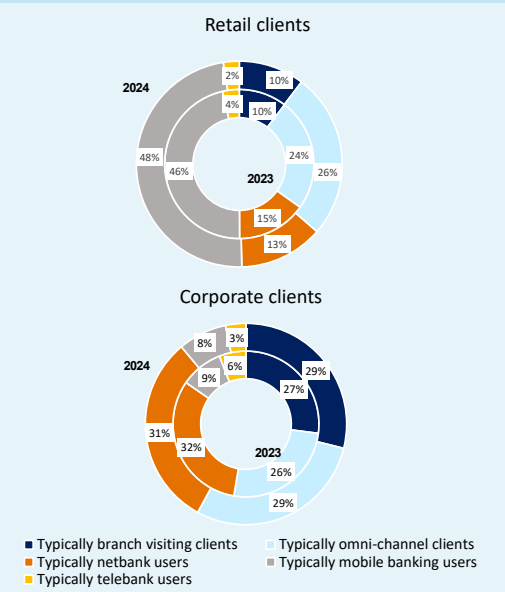
Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Generation Z is more financially aware, and this is partly due to the activities of domestic commercial banks. Younger generations find it less complicated to manage their finances, and this may be linked to the presence of banks in education and the publication of educational content on digital platforms. Beyond general tools to improve financial literacy, banks have also contributed to the financial inclusion of younger generations through targeted financial solutions. Most domestic banks offer account packages from the age of 6, which strengthens banks' long-term client retention capacity, as accounts opened at a young age allow financial institutions to build a loyal client base early and foster loyalty to banking products later on. One big step forward in 2024 was that all the institutions surveyed already had a unique set of accounts for 14–18-year-olds (Chart 58). It is also in the commercial interests of credit institutions to focus more on this age group, as younger people may be more receptive to value propositions from neobanks due to their digital literacy.

The increased focus on social media also contributes to the increasing digitalisation of client communication. Banks increased their presence on the main social media platforms in 2024 compared to 2023, which means that the surveyed institutions post more frequently on these platforms: one-half of the surveyed credit institutions are active on a daily basis on Facebook, Instagram or LinkedIn, for example, but the presence of banks on video-sharing portals is also becoming increasingly important. The TikTok platform, where many institutions publish content on a daily basis, can play a key role in communicating with young people. At the same time, it can also be observed that the institutions surveyed increased their online marketing expenditures (Chart 59).

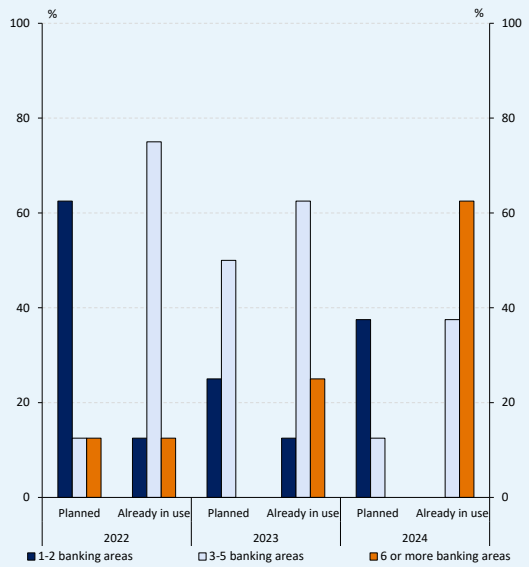
Chart 60
Distribution of retail and corporate customers by channel usage



Note: Weighting based on the proportion of customers at the institutions examined. Compared to the data published for 2023, there was a change in the methodology used for corporate clients, which we applied retroactively in the chart.

Source: MNB

Chart 61
Evolution of the number of applied FinTech solutions



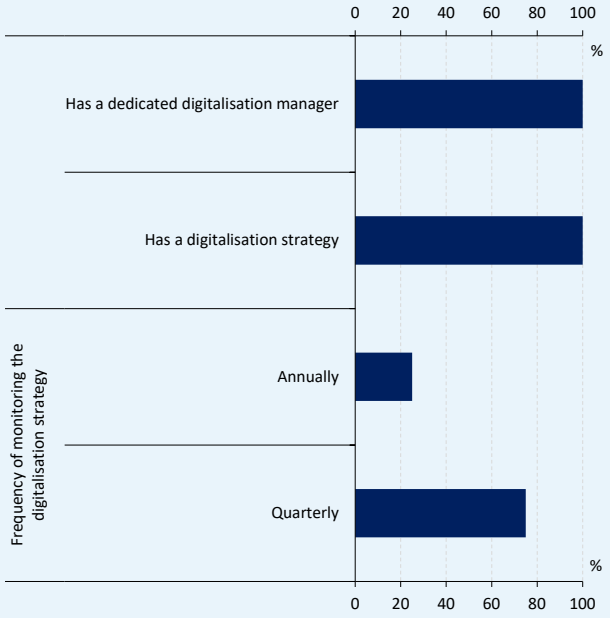
Note: Weighting in proportion of respondents.

Source: MNB

Following the digitalisation trends that have defined recent years, household and corporate channel usage habits did not change significantly in 2024. The level of digitalisation among household clients is high, and the segment that currently prefers to conduct their banking transactions at branches (approximately 10 percent of clients) is expected to be more difficult to encourage to use digital channels. Based on 2024 channel usage data, mobile banking channels continue to dominate for household clients (Chart 60). The level of digitalisation in the corporate sector is lower by comparison. This may be partly due to the fact that the digitalisation of the corporate product range is less mature, but the preference of corporate clients for face-to-face service may also play a role.

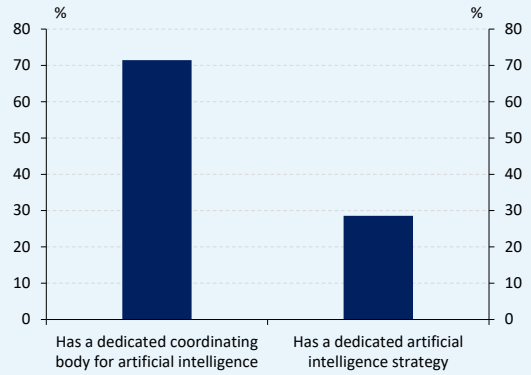
Domestic banks are increasingly entering into and implementing partnerships with FinTech and BigTech players (Chart 61). Compared to 2023, more banks are using FinTech solutions, primarily in the areas of compliance and risk management. Working with dynamic, innovative FinTech companies can boost the level of digitalisation of the banking system, as they are able to serve banks' needs in an agile way in areas where the banks are using less innovative solutions. In Hungary, this trend is also significant because the domestic FinTech sector has shifted strongly towards B2B; accordingly, mutually beneficial relationships can be established between banks and their FinTech partners, contributing to the digitalisation of the domestic banking sector and increasing its efficiency. The vast majority of domestic credit institutions are open to cooperation with FinTech players.

Chart 62
Frequency of digitalisation strategy development and monitoring among banks



Note: Weighting in proportion to the institutions surveyed.
Source: MNB

Chart 63
Proportion of banks with an AI coordination body and strategy



Note: In proportion to the institutions examined.
Source: MNB

4.3. PREPAREDNESS OF MANAGEMENT AND EMPLOYEES

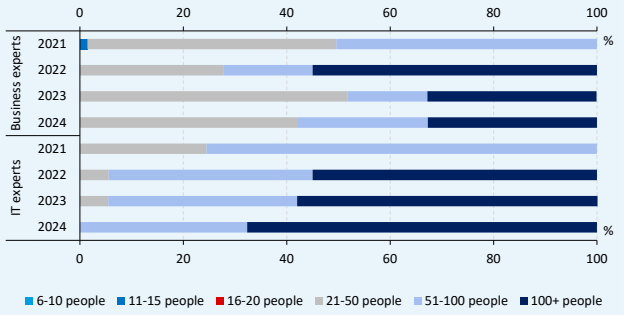
All of the domestic banks are committed to digitalisation, which is not only a long-term strategic focus, but also an integral part of managers' decision-making. Digitalisation is not only a short-term goal, but also a medium and long-term priority for the institutions. Accordingly, each institution has a digitalisation strategy, typically prepared for a 2–3-year timeframe, to ensure continuous adaptation to technological changes. All of the banks have a dedicated senior manager responsible for digitalisation who, as a board member, also has direct influence on strategic decisions affecting the bank (Chart 62).

Although the practical level of artificial intelligence (AI) integration varies from institution to institution, the trend is clear: AI is gradually becoming embedded in banking operations and is becoming a key pillar of digital transformation. More and more institutions are beginning to focus on the targeted application of AI and are setting up coordinating bodies for AI, but by contrast, only a few domestic banks currently have a dedicated AI strategy (Chart 63). The development of a strategy supports and promotes a comprehensive and focused approach to technology in the long term, and allows for the development of internal policies, procedures and ethical approaches and frameworks. The use of AI is becoming increasingly widespread in the domestic banking sector. The most common use is fraud detection, but it is also widely used to automate back-office processes. In terms of technology application, banks typically strive for in-house development, which allows them to develop bank-specific solutions. Banks see the greatest potential for using AI to improve operational efficiency and personalise the customer experience. However, there are several barriers to uptake: on the internal side, the main challenges are the lack of skilled labour and the cost of process re-engineering, while on the external side, reputational risk and uncertainty around liability for potential damage caused by AI-based solutions are the main barriers. Currently, there are significant differences between players in the extent to which they use technology: some banks focus on just a few use cases, while others are integrating technology in several areas.

Chart 64
Application of UX principles and methodologies in the domestic banking sector

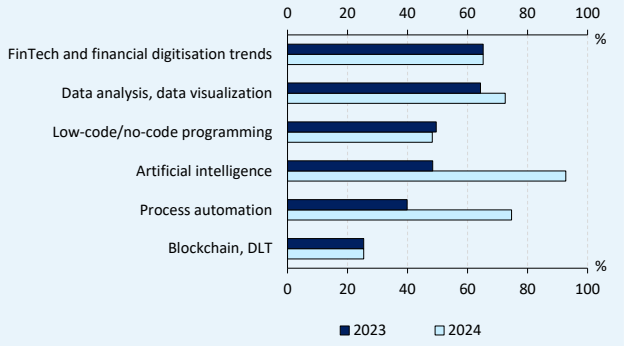
Note: Weighting in proportion to the institutions surveyed.
Source: MNB

Chart 65
Distribution of IT and business experts employed in areas of banking digitalisation



Note: Weighting in proportion to the total assets of the institutions surveyed.
Source: MNB

Chart 66
Innovative training topics available to employees in the banking sector



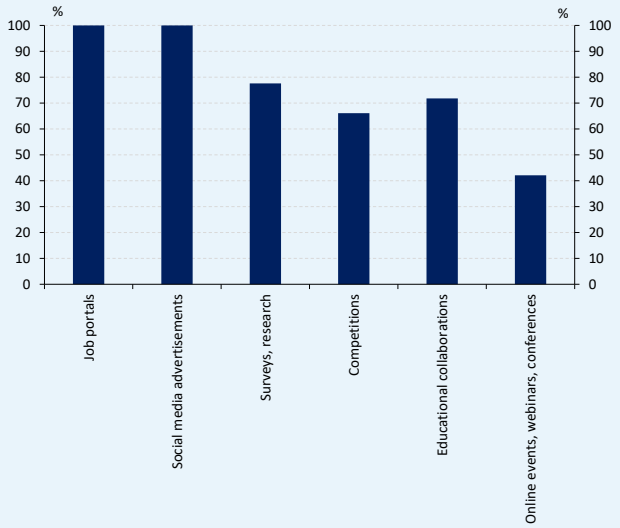
Note: Weighting in proportion to the total assets of the institutions surveyed.
Source: MNB

User experience (UX) design is already increasingly present in the decision-making stages of product development. In the domestic banking sector, there is a growing trend that UX is no longer just a design issue, but rather a strategic business factor. UX is already present at the strategic and operational level in the majority of banks, and several domestic banks have a UX strategy (Chart 64). The emergence of UX strategies illustrates that the competitiveness of digital services increasingly depends on the quality of the user experience. The specific involvement of UX teams in product design projects is also varied, with UX teams in most institutions playing an active role primarily in the design and prioritisation of features, as well as in the design of user interface flows and graphics.

In 2024, the role of IT experts in banking digitalisation areas continued to grow, but we also saw a moderate increase in the number of business experts (Chart 65). The increase in the number of employees reflects the sector's progress in digital transformation and the increasing resources that market participants are mobilising to remain competitive. The presence of IT experts plays a key role in digitalisation, as they are not only responsible for providing the technological background, but are often actively involved in the development of new digital products and services. At the same time, the role of business experts in digitalisation projects is gradually increasing, as they ensure that new products and services meet market and strategic objectives. This dual focus helps banks to remain competitive and efficient.

Banks are becoming increasingly aware of how to prepare employees for the digital challenges of the future (Chart 66). In 2024, training courses related to artificial intelligence and process automation doubled compared to last year. The rise of artificial intelligence, process automation, data analytics and data visualisation indicates that the sector has recognised the potential of deeper integration of digitalisation and is, accordingly, becoming more aware of the need to prepare for technological transformation. The vast majority of banks assign high priority to developing the digital competences of their IT staff, but the assessment of their AI skills is still largely ad hoc.

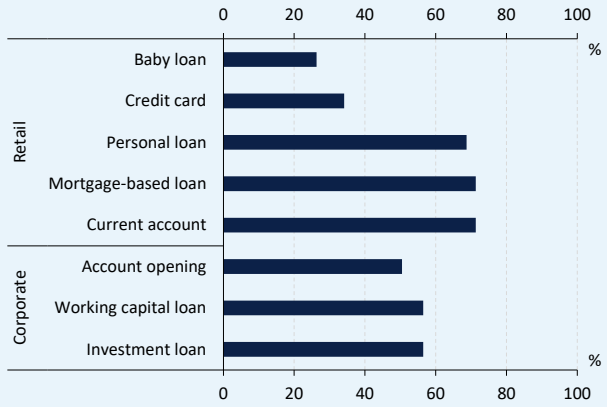
Chart 67
Application of recruitment techniques to reach digital talent



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Chart 68
Share of banking products for which the entire transaction process can be tracked digitally



Note: Weighting in proportion to the total assets of the institutions surveyed.

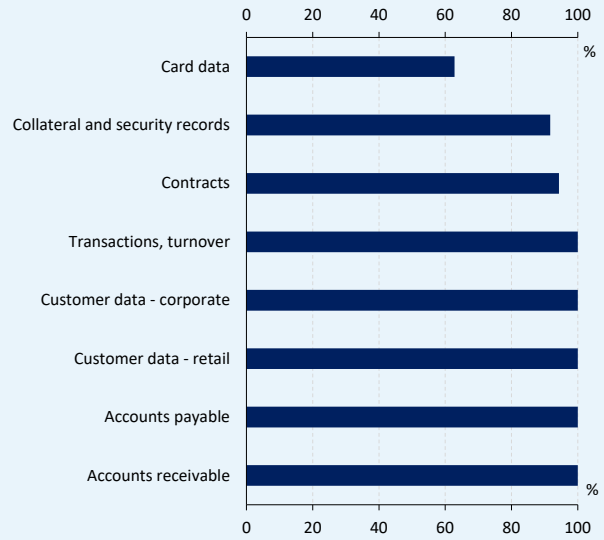
Source: MNB

Banks are no longer just looking for future employees through job advertisements, but also recruiting future talent through competitions and educational partnerships. Among digital recruitment methods, advertising on job portals and social media continues to play a prominent role, allowing targeted outreach – especially among younger generations who are primarily informed through online channels (Chart 67). At the same time, more and more institutions are expanding their recruitment toolbox with solutions such as educational partnerships and professional competitions. Through such programmes, banks not only generate professional interest, but also establish contact with talented young people who may later become employees.

4.4. DIGITALISATION OF INTERNAL OPERATIONS

In the banking sector, digital traceability in product applications varies significantly by product (Chart 68). In the household segment, the share is already higher for several products compared to corporate products, but coverage is not complete. On this side, it can be observed that higher levels of traceability have been achieved mainly for those products that are used by the widest range of clients and where optimising the digital customer experience is a direct competitive advantage. Products such as current accounts, personal loans and mortgage-based loans are good examples. The lower rate of digital traceability for some products is mainly explained by the fact that they are linked to processes that require multi-channel administration. On the corporate side, the medium level of traceability suggests that it is more difficult to provide real-time feedback to clients for more complex and often customised schemes, such as investment loans.

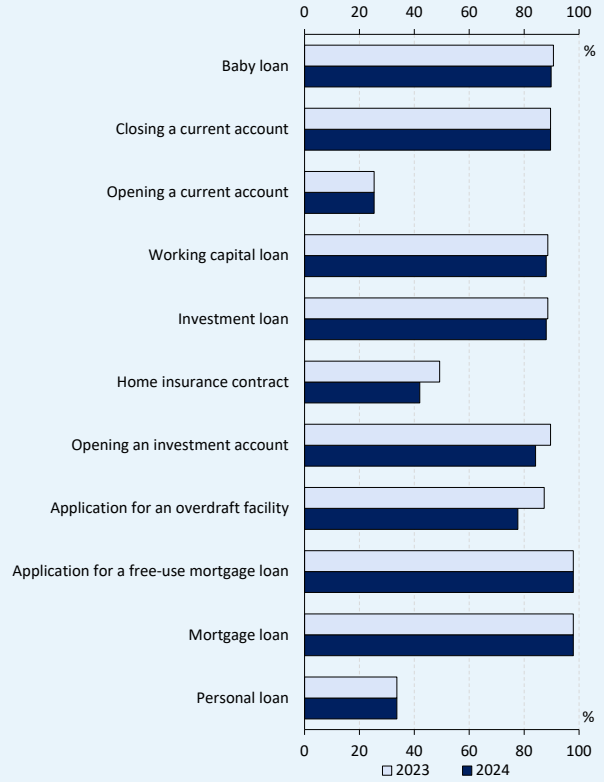
Chart 69
Share of records that are automatically updated



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

Chart 70
Share of banking products requiring paper-based documentation



Note: Weighting in proportion to the total assets of the institutions surveyed.

Source: MNB

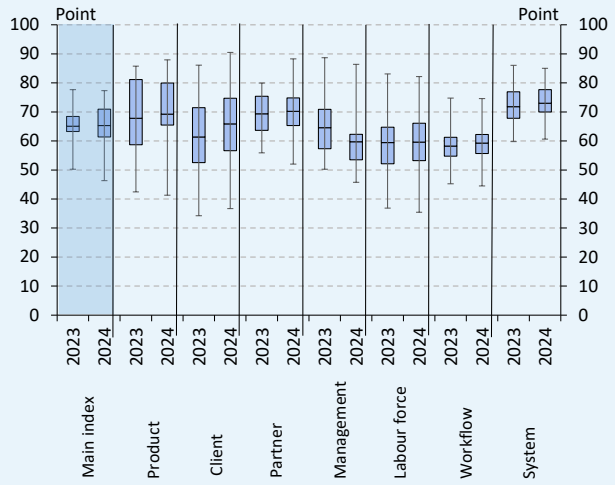
In principle, automatic updating of records has already been widely implemented, especially in those data sets that are closely related to daily operations and transaction management (Chart 69). This reflects the fact that the digitalisation efforts of the domestic banking sector have focused primarily on increasing the reliability of internal control processes and database support for operational risk measurement. The digitalisation of contract records is of particular importance, as it is not only an administrative function, but also one of the most important information bases for the entire banking operation. Digitally recorded contracts facilitate client qualification, legal compliance checks and the efficient operation of credit monitoring systems. The structured, real-time availability of contracts not only speeds up decision-making at the operational level, it also enables the integration of data warehouses at the strategic level.

In the domestic banking sector, the simultaneous presence of paper-based and digital forms of administration is still prevalent, but in certain product areas electronic documentation is gaining ground (Chart 70). The reduction in paper documentation is particularly noticeable for products with a higher number of clients, where digitalisation not only means technological modernisation but also provides banks with an operational advantage. Electronic documentation allows for faster processing, more accurate record-keeping and shorter administration times. However, a full digital switchover is not yet common practice, as the pace of digitalisation is not the same for all product categories.

5. Digitalisation level of the Hungarian insurance companies

According to the results of the digitalisation survey conducted by the MNB in the domestic insurance sector, which covers 90 percent of the sector in terms of gross premium income, the digitalisation level of domestic insurance companies improved moderately in the recent period, mainly in terms of the digitalisation of products and client communication. For insurance companies, digitalisation on the product side continues to be a priority, with the digital availability of directly applied products being widespread, while independent intermediaries are lagging behind to some extent in the online space. The prevalence of payment functions available on client portals and applications improved somewhat, but the sector performs less well than other sectors of the domestic financial market in terms of mobile applications. Management commitment to digitalisation is still not outstanding, but what is encouraging is that almost all institutions already have a digitalisation strategy in place, typically planned for the medium term and regularly reviewed. Artificial intelligence (AI) is already being used at a strategic and operational level in most insurance companies, and more and more institutions are offering digitalisation and AI-related training for their employees. While there is a relatively high level of digital maturity in terms of internal operations, the hardware and software asset base of market participants is perceived to be increasingly outdated. Significant differences in digital maturity between small and large insurance companies remain a feature of the insurance market as a whole. With the trend of rapidly rising expectations for digitalisation in general and under-investment, poorly performing insurers have lagged even further behind other institutions.

Chart 71
Development of the domestic insurance sector's digital maturity index, both by pillar and on aggregate



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

5.1. DIGITALISATION OF DOMESTIC INSURANCE COMPANIES

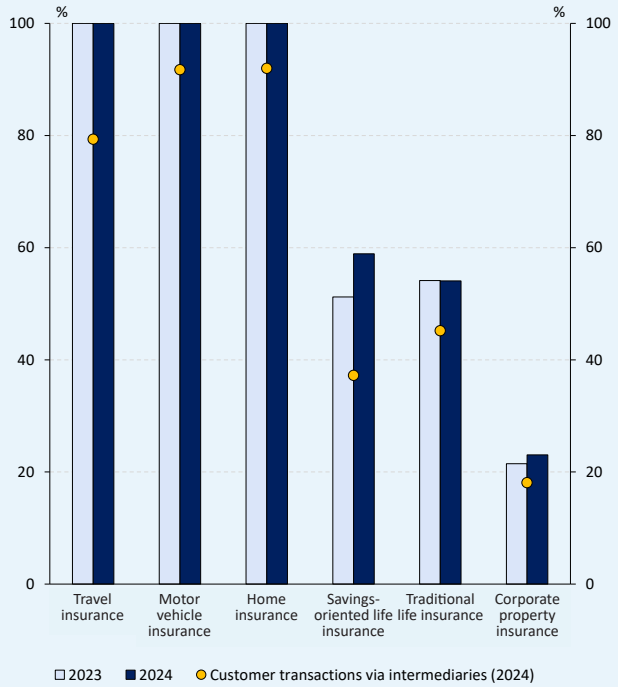
In 2024, the MNB assessed the digital maturity of domestic insurance companies for the sixth time. The digitalisation-focused questionnaire contains nearly 200 questions based on seven pillars, providing a comprehensive view of the preparedness and digital engagement of the insurance sector and the level of digitalisation of insurance products and back-office processes. Each year, the survey covers more than 90 percent of the domestic insurance market based on gross premium income, generating up-to-date, representative information on the digitalisation of the sector. The questionnaire was also updated for 2024 in order to keep up with the latest digitalisation trends and growing expectations. Due to changes in the players in the insurance market, the number of institutions surveyed decreased this year.

The digital maturity of the insurance sector stagnated in 2024. The MNB's annually updated questionnaire reflects the increasingly high digitalisation expectations of market players, but the institutions improved their development score by just 0.2 points from 65 points (on a scale of 0–100), which can be considered as stagnation (Chart 71). Increased costs (e.g. surtax) also significantly reduced the scope for investment in digital improvements in 2024. The top quartile of the main index continued to be dominated by insurance companies with a broad product range and a large customer base, while smaller insurance companies, which had been under-performing in terms of digitalisation in the past, lagged even further behind.

Chart 72
Digital maturity index of the domestic insurance market

Note: The chart shows median values.
Source: MNB

Chart 73
Digital accessibility of certain insurance product categories



Note: Weighting proportionally to the gross premium revenues of the examined institutions. In calculating the averages, institutions that do not offer the specified product were excluded from the analysis.

Source: MNB

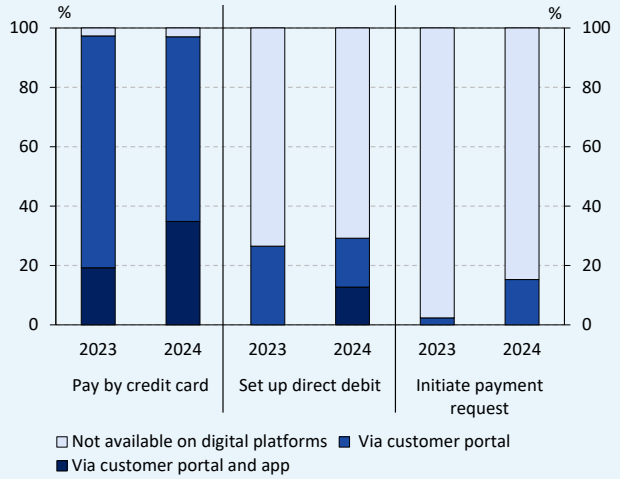
The widening of this gap is illustrated by the shift in the upper and lower quartile values, with the former improving from 68 to 71 and the latter deteriorating from 63 to 61.

A mixed picture emerges for each pillar, but overall progress can be identified in the client and product areas (Chart 72). In contrast to the main index, the increase in the product pillar score is almost entirely explained by the catching up of previously under-performing insurance companies, while the performance of larger institutions stagnated. Thanks to the increase in digital notifications and activity on social media, a collective improvement can be observed in the client pillar – i.e. institutions in the lower and upper quartiles have improved equally – resulting in the largest increase in points of all areas. The market has developed better than the other pillars in the area of relations and cooperation with external partner institutions, mainly due to the above-average development of two institutions. The significant drop in the average for the management pillar is explained by the emergence of new issues related to artificial intelligence and the loss of an insurance company with a particularly high digital maturity in the management pillar. There was a one-point increase in both the labour force and workflow pillars, which is reflected in both the lower and upper quartiles. The former was due to a significant improvement in the number of innovative training courses available to employees, while the latter was mainly influenced by improvements in the automation of various data transfer processes. Of particular note is the improvement in the system pillar: although insurance companies' perception of their own asset base deteriorated, the continuous improvement of internal systems led to a moderate increase in the pillar score.

5.2. DIGITALISATION OF INTERACTIONS WITH EXTERNAL STAKEHOLDERS

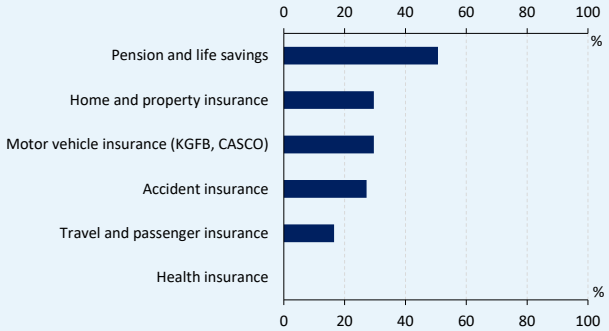
The digital availability of products applied for directly from insurance companies remains extensive, but there has been no significant improvement, and the digital sales capability of intermediaries is still somewhat lagging behind. Direct applications for travel, motor and home insurance products were fully available to customers digitally last year, but some institutions were unable to offer in-person contracting without the need for intermediaries. No significant shift can be seen in traditional life insurance and corporate insurance in terms of direct applications (Chart 73). With regard to intermediary management, it is worth highlighting the general business strategy of brokers, which is based on building trust and thus cross-selling personal advice, which is probably the reason for the lower level of digitalisation.

Chart 74
Availability of individual payment methods on the customer portal and in mobile applications



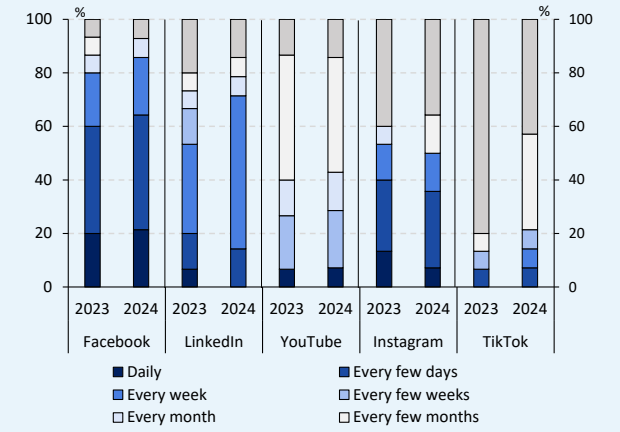
Note: Weighting in proportion to the gross premium income of the institutions surveyed.
Source: MNB

Chart 75
Proportion of insurers offering special deals based on customer data for specific product families



Note: Weighting in proportion to the gross premium income of the institutions surveyed. In calculating the average, we did not take into account institutions that do not sell the product in question.
Source: MNB

Chart 76
Frequency of use of certain social media platforms among domestic insurance companies



Note: Weighting in proportion to the number of institutions surveyed.
Source: MNB

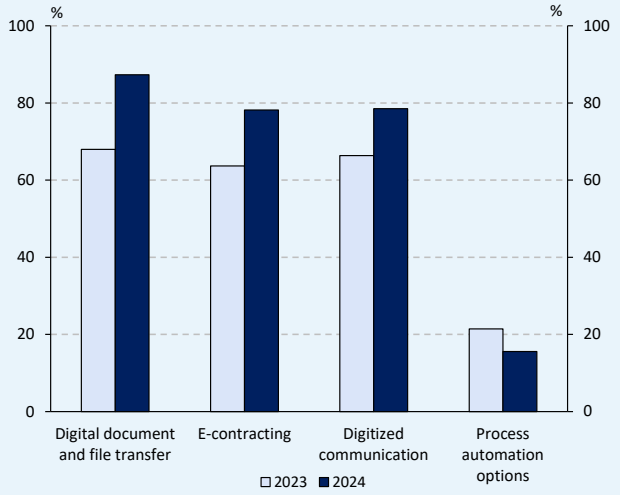
The significant difference between small and large insurance companies, which dominate the sector, is also reflected in the digital availability of products.

Alternative payment options are slowly spreading in the insurance market, while only one-third of institutions have a mobile app. In terms of the availability of payment functions on online portals, customers have almost universal access to credit card payment, while the possibility to set up a direct debit is only marginally available, and the payment request is available at even fewer institutions (Chart 74). A positive trend is the increase in the uptake of debit card payments within mobile applications and the emergence of direct debit, which offer greater convenience compared to traditional payment solutions (e.g. bank transfer, cheque). The picture is somewhat nuanced by the fact that only one-third of insurance companies have an app; thus, no significant progress can be identified so far. Based on the usage patterns and practices of bank customers, insurance companies with applications covering all business areas can gain a strong competitive advantage.

Potential clients are most likely to receive targeted enquiries based on data collected for savings products, which may indicate the importance of personalisation of this product group. Only two institutions do not use such information to better target specific customer segments. Half of the remaining institutions use the information for enquiries in connection with savings and one-third in connection with home, car and travel insurance (Chart 75). In the case of health insurance products, none of the institutions has such a targeted offer, which may be an indication of under-prioritisation of the product, but also of the specific nature of health insurance.

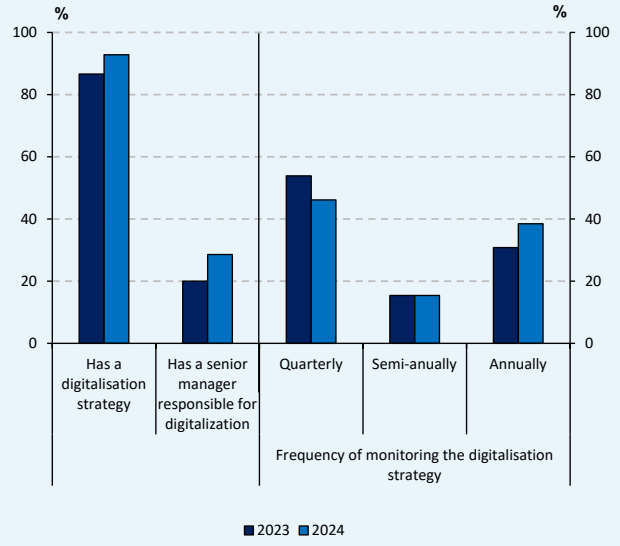
Facebook is still the dominant social media platform in the insurance market, but TikTok videos, which are typically aimed at young people, are also increasingly used by institutions. The proportion of institutions using social media has not changed for most platforms: Facebook continues to be used by almost all institutions, YouTube has a usage rate of over 85 percent, while LinkedIn and Instagram have moderately lower usage, but are used by a wider range of institutions. (Chart 76). Compared to 2023, TikTok saw the biggest jump, with 20 percent of insurers using the platform then, but by 2024 nearly 60 percent of insurance companies were using the platform with some frequency, which may indicate a shift in insurers' marketing towards a younger age group.

Chart 77
Prioritising specific digitalisation aspects when renewing supplier contracts



Note: Weighting in proportion to the gross premium income of the institutions surveyed.
Source: MNB

Chart 78
Frequency of digitalisation strategy development and monitoring in the insurance sector



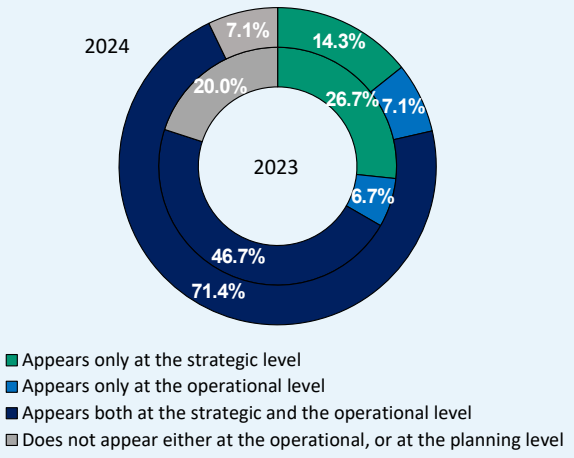
Note: Weighting in proportion to the institutions surveyed.
Source: MNB

When renewing their supplier contracts, domestic insurance companies are increasingly looking to digitalise their partnerships. Expanding digital functionality and digital connectivity reduces costs and improves transparency by increasing efficiency, while reducing the risk of human error and contributing to environmental sustainability by reducing paper-based administration. This is why insurance companies are increasingly prioritising modern solutions when renewing supplier contracts. The existence of digital document and paper handling and e-contracting has become much more important for the market, with the former being identified by almost all institutions as a priority in 2024, while process automation is still not prioritised (Chart 77). Digitalisation offers a significant competitive advantage in all areas of insurance operations; accordingly, partners who support it will also find it easier to build collaborations in this market.

5.3. PREPAREDNESS OF MANAGEMENT AND EMPLOYEES

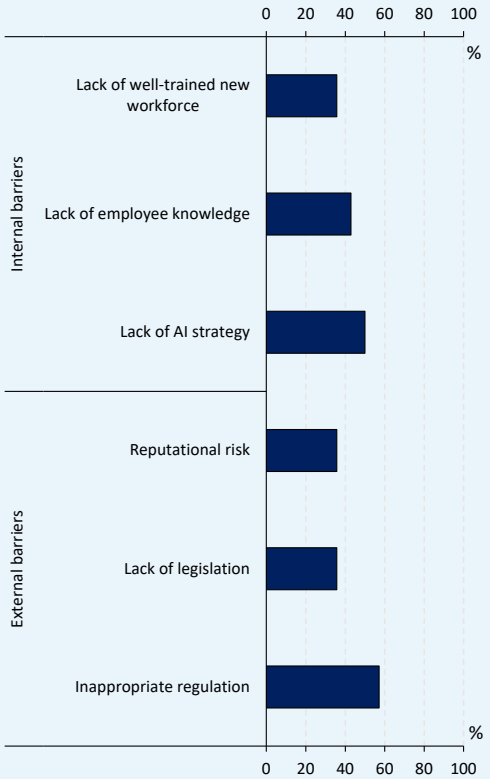
Management commitment to digitalisation is still not outstanding, but the fact that almost all institutions have a medium-term digitalisation strategy is an important step forward. In 2024, more than 90 percent of institutions already had a digitalisation strategy in place (Chart 78), typically planned for 2–3 years. This medium-term strategic approach facilitates rapid and flexible adaptation to the constantly changing market and technological environment. The number of quarterly reviews has decreased and is mainly limited to institutions with medium-term strategic planning. 80 percent of institutions already have both overall digital transformation and IT cost optimisation as strategic objectives. Although some progress has been made, only around 30 percent of institutions have a senior manager dedicated to digitalisation, who is typically also a member of the organisation's board of directors. The institutions self-report that they are already well prepared for the challenges of digitalisation, but this is not yet complete, and both management commitment and a comprehensive organisational transformation approach are crucial to achieving this.

Chart 79
Existence of principles and methodologies for the implementation and operation of AI-based solutions in the insurance sector



Note: Weighting in proportion to the institutions surveyed.
Source: MNB

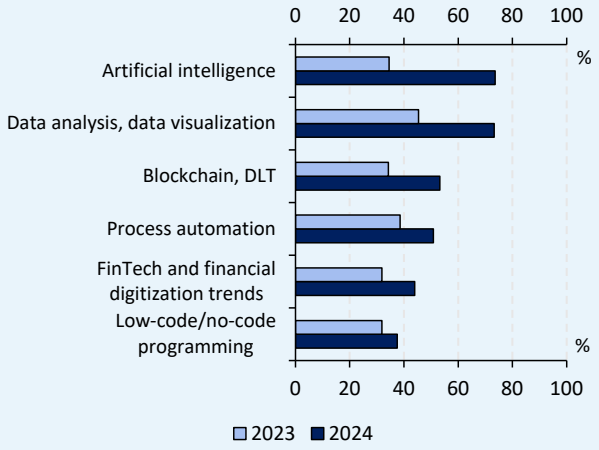
Chart 80
Potential internal and external barriers to the introduction of AI-based solutions in the insurance sector



Note: Weighting in proportion to the institutions surveyed.
Source: MNB

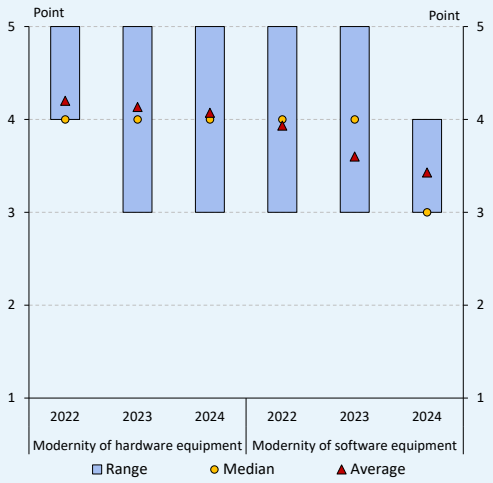
Half of domestic insurance companies already have an AI strategy in place, but senior managers and dedicated teams or coordinating bodies responsible for its implementation are not yet common. There has been a significant increase in the integration of artificial intelligence among domestic insurance companies, which may lead to increased sector maturity and competitiveness. The vast majority of insurance companies now apply AI principles and methodologies at both strategic and operational levels (Chart 79). Half of the insurance sector already has an AI strategy in place, which is a huge step forward for the domestic market. The potential of AI to improve customer experience is seen as particularly high, with 92 percent of institutions identifying it as a high priority. While still small in number, dedicated AI coordination bodies and teams are gaining ground among insurance companies, doubling in number compared to last year and now covering more than 40 percent of the sector. However, the existence of a manager in charge of AI or with the corresponding responsibilities is not yet common among insurance companies. At the sector level, one major challenge is internal preparedness, in particular the lack of AI strategies and lack of employee knowledge, which highlights that successful integration requires not only technological, but also organisational preparedness (Chart 80). At the same time, external factors, such as inadequate regulation or lack of legislation, can act as a significant disincentive to the uptake of AI-based solutions at the sector level. The insurance sector needs not only institutional commitment to technological upgrades, but also a supportive and predictable legal environment.

Chart 81
Innovative training topics available to employees in the insurance sector



Note: Weighting in proportion to the gross premium income of the institutions surveyed.
Source: MNB

Chart 82
Assessment of the modernity of insurance equipment based on self-declaration by institutions



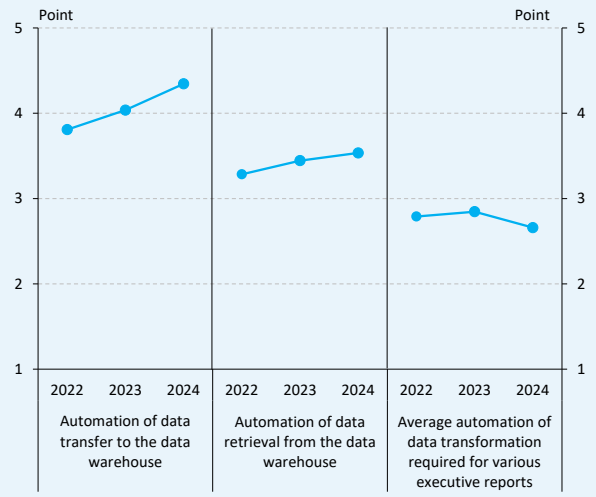
Note: On a scale 1 to 5; 1 = most obsolete, 5 = most modern.
Source: MNB

In the insurance sector, the focus of employee training is increasingly on AI and data analytics, in line with the technological transformation. According to their own self-reporting, insurance companies also feel the need to improve the digital skills of their employees; therefore, they have significantly increased the availability of innovative training courses compared to previous years (Chart 81). At the sector level, the two most popular training topics are artificial intelligence and data analysis. Both have grown significantly and are now available at nearly 80 percent of insurance companies. General internal knowledge transfer typically continues to take place when new colleagues join the company, but it is also common for senior employees at several insurance companies to provide further internal training for their colleagues several times a year. Market participants assess the digital skills of their employees predominantly on an ad hoc basis. 57 percent of insurance companies allow their employees to participate in digitalisation-related training once every six months to improve their knowledge. Assessing the artificial intelligence skills of IT workers is not yet common, but it is happening in some institutions on an ad-hoc basis. Developing internal knowledge and training employees in technology help insurers to be ready to respond to the challenges of digitalisation and take advantage of innovations.

5.4. DIGITALISATION OF INTERNAL OPERATIONS

According to the assessment of domestic insurance market players' own infrastructures, they are moderately behind in terms of hardware assets, but significantly behind in terms of software solutions compared to current expectations. Continuous improvement of the hardware and software base is also essential in the insurance market to maintain competitiveness, reduce operating expenses and ultimately improve the customer experience. While small-scale developments, which can be tracked by various indicators, are ongoing, major digital investments in the insurance sector seem to have lagged behind in recent years, with a growing gap between the perception of existing and modern asset base as technologies evolve. This appears to be mainly due to the under-purchase of new software, with no institution giving itself a rating of 5 for the first time in 2024, bringing the average below 3.5 and the median down to 3 (Chart 82). For hardware, the perception of the majority of insurance companies is also deteriorating, but to a lesser extent.

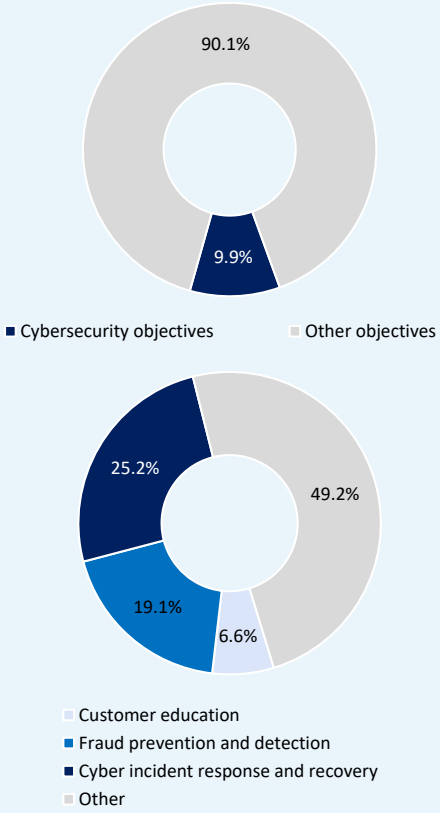
Chart 83
Automation of data transfer processes in the insurance sector



Note: The displayed values were calculated from the premium income-weighted average of the responses. On a scale 1 to 5; 1 = the process is not automated at all, 5 = fully automated system.

Source: MNB

Chart 84
Proportion of IT budget spent on cybersecurity (top chart), distribution of cybersecurity budget across different objectives (bottom chart)



Note: The displayed values were calculated from the premium income-weighted average of the responses.

Source: MNB

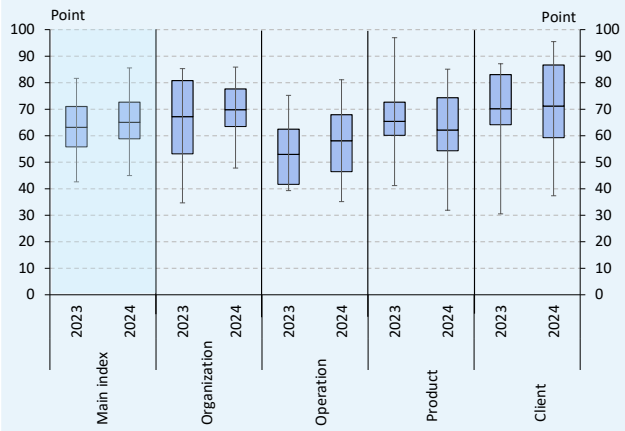
Overall, the digitalisation of data transfer processes is progressing at a modest and slowing pace. Some progress has been made in the transfer of data to the data warehouse, while the automation of data retrieval has slowed compared to recent years (Chart 83). For all types of senior management reports in the questionnaire, there is a moderate decrease in the automation of data transformation. This may be due, on the one hand, to the over-prioritisation of other digital functions and, on the other hand, to the general increase in expectations regarding automation, resulting in a different interpretation than in the previous year examined. The development of automation shows that insurance companies continue to pay attention to improvements in their internal processes.

On average, insurance companies spend one-tenth of their IT budgets on cybersecurity, with the bulk of the funds spent on cyber incident response and recovery. Insurance companies still spend a significant portion, nearly one third of their cybersecurity budget, which accounts for approximately 10 percent of their IT budget, on a reactive basis, i.e. on recovery, while investment in prevention accounts for a smaller proportion (Chart 84). In order to ensure more efficient and sustainable operation, it may be justified to further increase the proportion of preventive expenditure, in particular to strengthen digital awareness and proactive protection mechanisms (e.g. risk assessment, penetration testing), as this could not only lead to a relative reduction in material damage, but also to higher efficiency through cost reduction.

6. Digitalisation level of Hungarian investment service providers

In 2024, the MNB's digitalisation survey covered the investment services sector for the second time. According to the results of the digitalisation survey which covered nearly 85 percent of domestic investment service providers based on client assets, the digital maturity of domestic household investment service providers improved moderately, mainly in terms of organisational culture and internal operations. The range of products available fully online, without the need for face-to-face administration, expanded, but the level of digitalisation of transactions related to account closure and pension savings accounts (NYESZ) remains low. Around half of investment service providers' clients prefer digital channels, with email remaining the primary channel for client information. Significant progress was made in terms of internal processes and value chains, especially in the digitalisation of documents related to securities and long-term investment accounts (TBSZ). In terms of organisational readiness, managers continue to pay particular attention to digitalisation, which is also reinforcing the presence of artificial intelligence. To this end, it is important to develop the knowledge of employees, and more and more service providers are launching internal training courses to support this. The market continues to be defined by the difference between institutions with a banking and non-banking background, as the former find it easier to implement digital developments in their investment units due to scale-efficiency and existing infrastructure.

Chart 85
Digital maturity index of Hungarian investment service providers by pillar and total score



Note: The chart represents the minimum, the maximum, the lower and the upper quartiles and the average values.

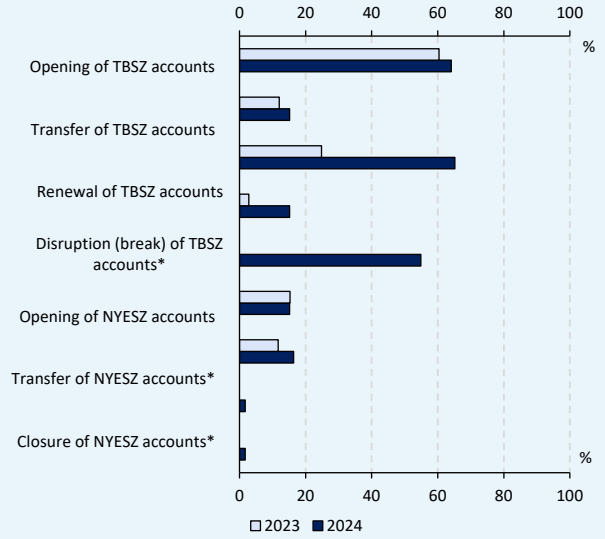
Source: MNB

6.1. DIGITALISATION OF HUNGARIAN HOUSEHOLD INVESTMENT SERVICES

In 2024, the MNB assessed the digital maturity level of domestic household investment service providers for the second time, thereby making it possible to measure its improvement. The survey analyses the digital maturity of the institutions surveyed in terms of four pillars, covering their entire operations (Chart 85). More than 100 questions were included in this year's survey, providing a comprehensive picture of the digital maturity of service providers. The examined institutions covered nearly 85 percent of domestic investment service providers based on client assets.

According to the MNB's survey, the digital maturity of domestic household investment service providers improved moderately in 2024. As in the first year examined, the market for investment service providers is still dominated by the difference between institutions with and without a banking background, which are better able to implement digital developments in the investment department thanks to their existing infrastructure and scale-efficiency. This difference is most noticeable in the organisation and operations pillars, where the investment departments of each financial institution scored on average 16 and 23 points higher, respectively. Companies with a banking background also performed better on the client side, while those without a banking background gained 4 points in the product pillar. This may indicate, on the one hand, that these players have a more focused product range, i.e. while

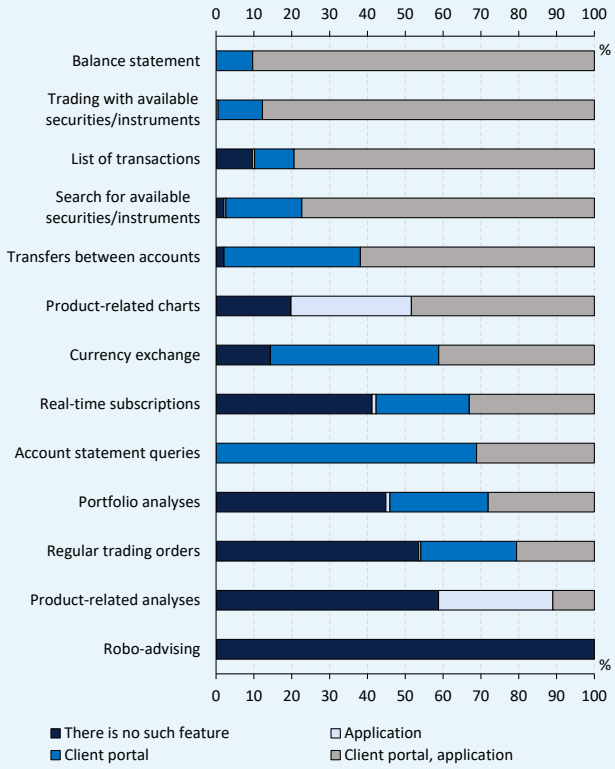
Chart 86
Availability of digitally accessible financial products among investment service providers



Note: Weightings determined based on the proportion of client assets managed by the evaluated institutions. For products marked with an asterisk, last year's data is not available.

Source: MNB

Chart 87
Functions available on the client portal and mobile app



Note: Weighting in proportion to the client assets managed by the institutions surveyed.

Source: MNB

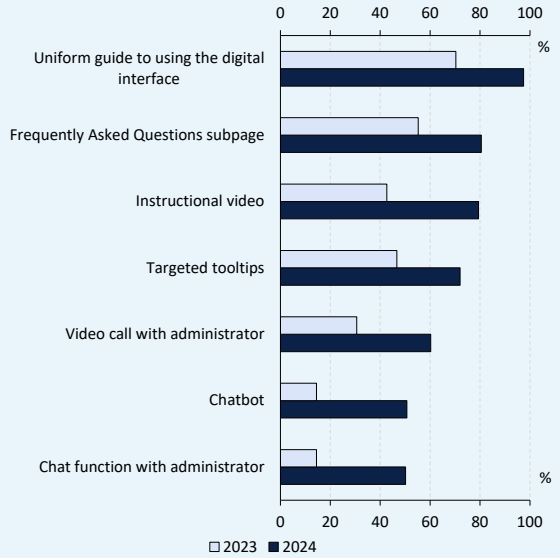
institutions with a banking background have to decide whether to develop the digitalisation of their banking (and in some cases insurance) products, dedicated investment service providers do not face such allocation problems. On the other hand, institutions without a banking background do not have the infrastructure for face-to-face transactions and therefore prefer to opt for the online space to expand functionality. In addition to this, the organisation pillar is characterised by a moderate catching-up of the providers with weaker performance, while the client pillar shows a significant increase in the variance of scores between institutions, presumably due to changes in the questionnaire reflecting the increase in expectations. The product pillar is moderately down, reflecting higher digitalisation expectations in the current survey. The two-point improvement in the main index and the moderate catching-up of institutions with weaker performance indicate that the market continues to prioritise digitalisation improvements.

6.2. DIGITALISATION OF INTERACTIONS WITH EXTERNAL STAKEHOLDERS

The range of products available fully online, without the need for face-to-face administration, expanded, but the level of digitalisation of transactions related to account closure and pension savings accounts (NYESZ) remains low. The biggest increase was seen in the digitalisation of long-term investment accounts (TBSZ), where the entire sector is now digitally managed, with the exception of a few banks (Chart 86). The digitalisation of account closing procedures is higher among players without a banking background participating in the survey, as they have fewer opportunities for personal administration than banks with a nationwide branch network. Overall, it can be concluded that the digitalisation of customer acquisition is already relatively high, but the complete digitalisation of the product range has only been achieved in a small part of the sector. This can probably be explained by the fact that investment service providers are less interested in speeding up the process of client relationship termination.

In the case of domestic investment service providers, the range of functions available on the client portal is extensive, but more and more can be done on mobile apps. All institutions surveyed have a mobile app and a client portal. However, there are significant differences in the maturity of the different digital interfaces: while some players offer a wide range of functionalities, others are still underdeveloped. Typically, more complex services that support conscious investment (e.g. portfolio analysis, product-related analysis) are those with more limited availability (Chart 87). By contrast, for example, searching for and trading essential products is now available everywhere. For several institutions, a significant part of the services is still only available on the client portal.

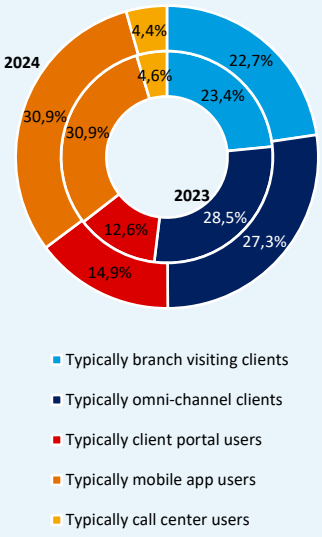
Chart 88
Availability of assisting features for digital interfaces



Note: Weighting in proportion to the client assets managed by the institutions surveyed.

Source: MNB

Chart 89
Distribution of retail clients by channel usage among investment service providers



Note: Weighting in proportion to the client assets managed by the institutions surveyed.

Source: MNB

For the future, priority may be given to the implementation of more sophisticated investor tools (e.g. portfolio analysis, product-related analysis), as this could provide a competitive advantage.

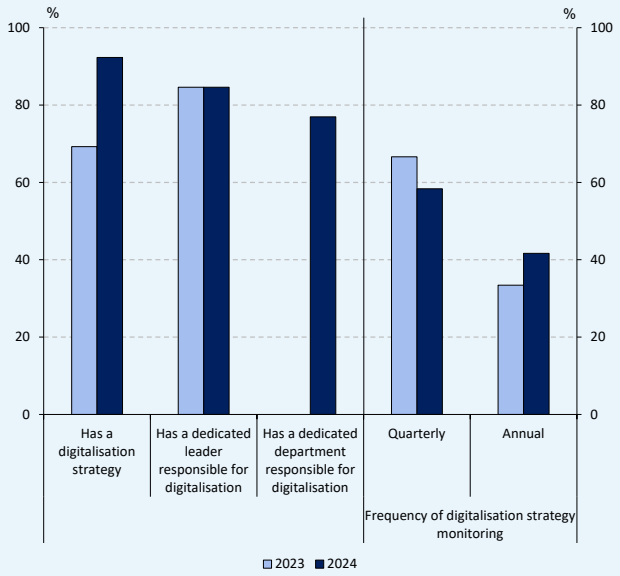
The players in the sector with a banking background can benefit from the wider availability of features to manage digital services on their platforms. 2024 saw a significant increase in the range of tools available to support digital administration, with guides, FAQ sub-pages and tutorial videos now available in most of the sector (Chart 88). At the same time, features to facilitate digital communication (chat or video call with an administrator) were added. The ease of use of interfaces improves customer experience and thereby the competitiveness of individual players; therefore, it is important that service providers with a banking background have an advantage in this area. Institutions without a banking background typically have fewer resources to allocate to development, which can put them at a competitive disadvantage in the longer term.

The channel usage habits of investment service providers' clients in 2024 did not change significantly compared to 2023. Almost one-half of clients typically prefer a digital channel, but face-to-face meeting is still important for around 22 percent of clients (Chart 89). There has been a moderate increase in the number of clients using client portals, which may be related to their higher functionality. On digital platforms, the predominant authentication solutions are SMS codes to mobile phones and authentication via apps (push messages, QR codes).

6.3. ORGANISATIONAL PREPAREDNESS

Digitalisation continues to be a key focus of attention for the sector at the management level. More than 90 percent of financial service providers already have a digitalisation strategy in place, and regular reviews of these strategies have become part of their organisational operations. As in other areas, the timeframe for planning the strategy and the frequency of monitoring vary between different types of institutions. Operators with a banking background are characterised by a quarterly assessment cycle, mainly combined with short-term planning. By contrast, institutions without a banking background tend to have longer-term strategic orientations, but these are usually only monitored on an annual basis. In the medium and long term, digitalisation is a key priority in decision-making (Chart 90). This is evidenced by the fact that the vast majority of organisations have already appointed a senior manager responsible for digitalisation, and there is a growing number of dedicated digital teams to support the delivery of strategic objectives.

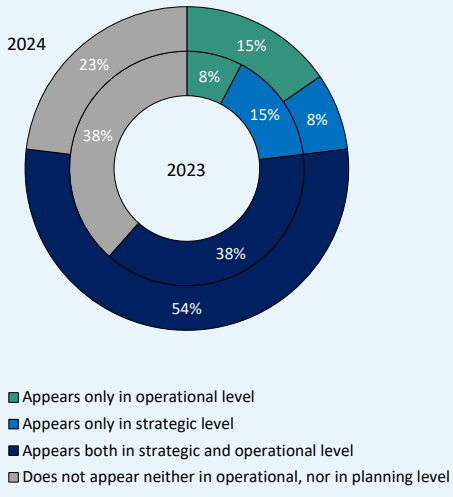
Chart 90
Availability of digitalisation strategy and frequency of monitoring within the investment service providers



Note: Weighting in proportion to the institutions surveyed. The response options for the area of digitisation were included in the questionnaires for the first time in 2024.

Source: MNB

Chart 91
Existence of principles and methodologies for the implementation and operation of artificial intelligence-based solutions among investment service providers



Note: Weighting in proportion to the institutions surveyed.

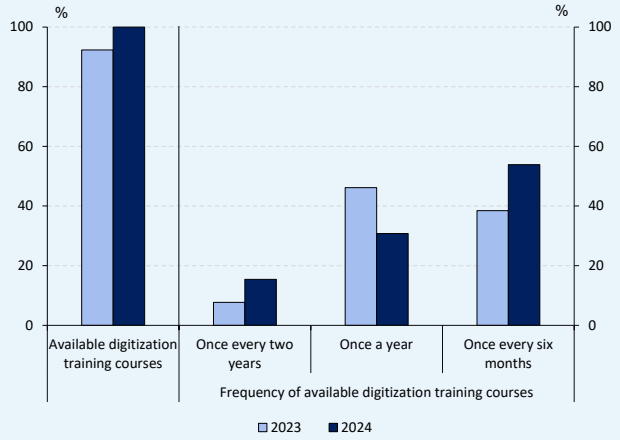
Source: MNB

The majority of institutions consider their digital readiness to be adequate, but not yet complete. Players with a banking background typically reported a higher level of preparedness, while institutions without a banking background gave a more restrained assessment. At sector level, there is also room for improvement in the development of a corporate culture that supports digitalisation.

There is growing interest in artificial intelligence among investment service providers, but application of the technology is not yet mature. Although the adoption of principles and methodologies for implementing and operating AI-based solutions is becoming more widespread among investment service providers, the sector still lags behind banks and insurance companies (Chart 91). At the same time, several institutions are using AI for tasks such as data reporting and text creation. The first AI-based solutions for client acquisition have also appeared among investment service providers. Examples include personalised marketing messages and natural language processing (NLP) used for contacting clients. For existing clients, the industry does not yet offer AI-based solutions, i.e. automated trading functions or AI-generated market forecasts are not yet available. A number of institutions have already assessed the AI skills of their IT staff, and in-house AI-focused training is increasingly available, especially in organisations with a banking background. One of the most important internal barriers to the adoption of AI is the lack of employees with the right skills and experience, while external factors are primarily the uncertainty of the regulatory environment and the reputational risks associated with the use of the technology. To successfully implement AI, it is essential for the sector to further develop its internal competences.

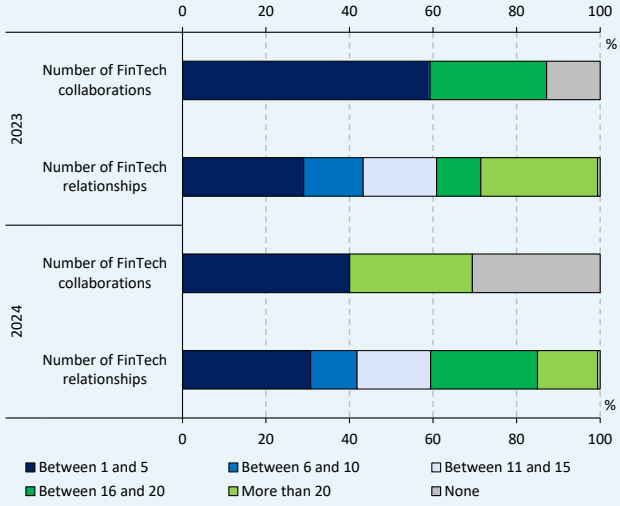
More and more digitalisation training is available at sector level to improve employees' competences. All investment services now provide digitalisation training for their employees (Chart 92). However, the frequency of training varies: while institutions with a banking background typically offer training every six months, service providers without a banking background tend to make it available every year or every two years. 70 percent of institutions already offer digitalisation training at different levels or building on each other. The transfer of internal knowledge is also becoming more structured, with training for new entrants taking place in almost all institutions, and senior colleagues at service providers with a banking background holding internal further training several times a year.

Chart 92
Application of principles and methodologies for the implementation and operation of AI-based solutions



Note: Weighting was done in proportion to the institutions surveyed.
Source: MNB

Chart 93
Evolution of cooperation between investment service providers and FinTech companies



Note: Weighting in proportion to the number of institutions surveyed.
Source: MNB

Increasing the digital literacy of employees and targeted training capacity development can provide a sustainable long-term solution for institutions to successfully adapt to technological innovations.

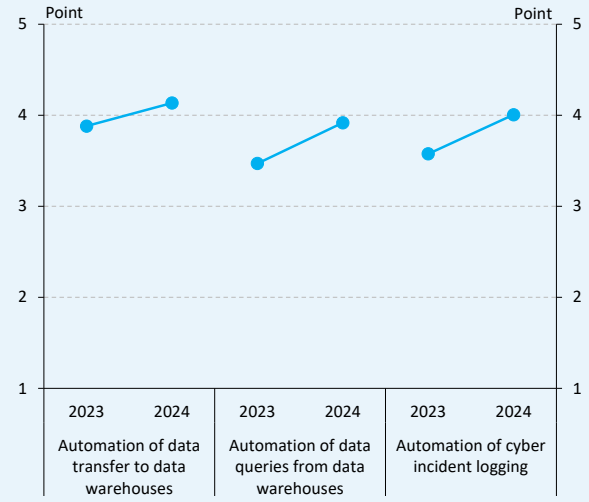
Investment service providers envisage implementing FinTech innovation primarily through their own internal development rather than by working with external partners (Chart 93). Interest in FinTech firms among domestic investment service providers remains moderate. Although several institutions have established relationships with FinTech actors, most of these are informal and do not result in structured, operational cooperation. Active partnerships are more prevalent among service providers with a banking background, who are in contact with several FinTech companies, but also among them the number of actual collaborations is low. At the sector level, digital communication with external partners is a common expectation, as well as electronic contracting, digital document management and process automation when renewing supplier contracts.

6.4. DIGITALISATION OF INTERNAL OPERATIONS

The digitalisation of investment service providers' internal processes improved moderately in 2024, while the perception of their own hardware and software asset base remained unchanged. The automation of data transfer and retrieval improved in 2024, but there are still significant differences between institutions. The difference between banks and non-banks, which determines the digitalisation of the sector, is also evident here, with further improvements in automation mainly driven by the former, while other service providers are lagging behind. There is a collective improvement in the logging of cyber incidents, and with the reduction in variance, the difference between the two groups of institutions also narrowed (Chart 94). In the sector, it is still not common practice for management approvals to be delivered digitally or electronically. Also for client data, only institutions with a banking infrastructure collect client data digitally or use data analytics in this area. Domestic investment service providers' own assessment of the modernity of their asset base remained unchanged in 2024, indicating the existence of upgrades in line with the increase in expectations.

Significant progress was seen in the digitalisation of key product value chains, with more and more institutions showing signs of full digitalisation of their processes. While in 2023, a fraction of institutions reported that the process for each product was fully digitalised, by 2024 this proportion had risen to almost 50 percent for securities and long-term investment accounts. Institutions with and

Chart 94
Automation of data transfer processes among investment service providers

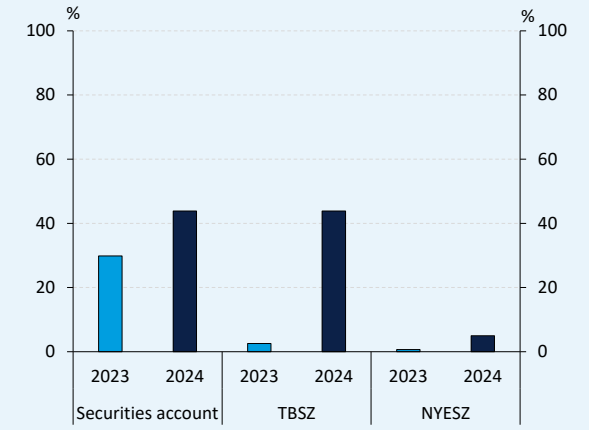


Note: The values were calculated based on the weighted average of responses based on client assets.

On a scale 1 to 5; 1 = the process is not automated at all, 5 = fully automated system.

Source: MNB

Chart 95
Proportion of institutions managing all processes for individual products digitally



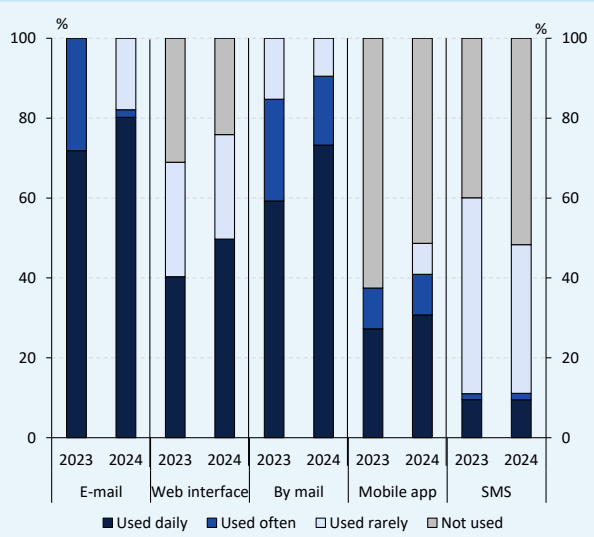
Note: The values were calculated based on the weighted average of responses based on client assets.

Source: MNB

without a banking background were both affected, with significant catching-up in the latter group. For service providers that are still not fully digitalised, paper documents are mostly digitalised at the time of product application and contract conclusion (Chart 95).

E-mail remains the number one channel for client information among investment service providers. There has been a moderate improvement in the way institutions communicate with their clients, mainly due to an increase in the number of mobile app notifications and a decrease in the use of SMS (Chart 96). Digitalisation developments are somewhat tempered by the fact that the use of postal communication continues to dominate due to the usage patterns of institutions with a banking background. The improvement of internal systems and the use of modern notification channels can also be an advantage for investment service providers in terms of efficient and competitive operation; therefore, improvement in this area can also be a high priority.

Chart 96
Proportion of use of customer information channels



Note: The values were calculated based on the weighted average of responses based on client assets.

Source: MNB

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