

# Technology transformation and policy implications

## 1. Technology impacts and related opportunities

### 1.1 Magnitude and speed of the digital transformation underway in the financial sector

An industry representative stated that digitalisation is profoundly reshaping the way financial services are conceived, delivered and consumed. The adoption of technology such as cloud services is contributing to modernise the financial services sector and providing significant opportunities in terms of efficiency and safety enhancement. A Central Bank official added that digitalisation may lead to many positive changes in the financial sector, such as enhancing transparency, the depth and liquidity of markets and increasing innovation with new forms of competition entering the market. Digitalisation might also contribute to improving risk mitigation and financial stability because banks may be able to make more informed decisions using digital tools.

A second industry representative observed that the changes and enhancements from digitalisation will come progressively in different parts of the financial sector and the broader economy. An immediate and fundamental digital transformation in all areas of finance should not be expected and whether these changes will eventually be transformative will be seen in the longer term. Significant changes are already happening through mobile applications, web portals and chatbots. There is currently emphasis on improving customer experience, but broader transformations as a result of new technologies are still to be seen in terms of new product offerings, shifts in revenue mixes, efficiencies and cost curves, and improvements of financing options, strategies and liquidity. The impact of the digital transformation indeed has to be evaluated from a customer and company perspective and also on a broader market level in terms of infrastructure, competition and market liquidity. The wider impacts on economic growth and the financing of the economy also need considering.

A third industry representative pointed out that the short-term impacts of technology tend to be overestimated and longer term impacts underestimated. That has already been proven for many technological disruptions such as the internet and smartphones. That however will give some time to adapt the regulatory approach to these new developments.

A regulator highlighted the rapid pace of technological change in financial services. In October 2022, the FCA and the Bank of England surveyed a number of UK financial firms, all of whom reported increased usage of artificial intelligence (AI) and machine learning (ML). 72% of firms reported using or developing ML applications. Surveyed firms also expected the overall median number of

applications of AI and ML to increase 3.5 times over the next three years. 50% of respondents reported regulatory constraints related to ML development, showing that although designed to be technologically neutral, the regulatory rulebook may not be fully adapting to the ongoing technology evolutions within financial services.

### 1.2 Evolution of the IT infrastructure and data management capacity

An industry representative noted that there needs to be a transformational shift in the IT systems of financial institutions to reap the full benefits from digitalisation. Some legacy tech stacks are not compatible with future technologies, and the ability to use data effectively with legacy systems is very challenging. Complex processes that do not align with new technologies pose an additional risk. Data is becoming a key competitive advantage of financial companies, so understanding a company's data estate and building blocks is essential for future evolutions, such as implementing distributed ledger technology (DLT).

A second industry representative emphasised that replatforming the sector's IT infrastructure, which is dated in many cases, is essential for supporting an effective digital transformation. The legacy infrastructure needs to be transformed, leveraging new technologies such as cloud services, artificial intelligence (AI) and application programming interfaces (APIs) in a way that does not disrupt the current business or increase systemic risks. The objective is notably to better exploit the data available to better serve customers and enhance the efficiency and safety of the financial ecosystem and also direct capital to the areas of financial services where there is most value.

A second area where technology can play a key role, the industry representative suggested, is ESG and supporting the sustainable transition, which requires the collection and storage of huge amounts of data in a trusted way. The scope of the data needed was not anticipated in the design of IT systems built more than five years ago, so most market players are confronted with this problem. This is a challenging area however, because there is the risk of being accused of greenwashing if the data used is incorrect or incomplete.

A third industry representative noted that cloud services sit at the heart of the ongoing digital transformation, as the computing power available in the cloud is needed to fully leverage the potential of AI and generative AI in particular. An important benefit of the cloud is lowering the barriers to access to technology, both for the bigger and the smaller financial entities. That may facilitate the access of new entrants in the market, which is important for stimulating innovation and competition, as well as the emergence of new use cases based on AI. Cloud services can also help to strengthen operational resilience, which is essential in the current geopolitical context where cybersecurity risks are rising.

### 1.3 The opportunities from digital assets and tokenisation

An industry representative highlighted that tokenisation and the move towards digital assets are a significant area of change supported by new technologies. Many initiatives taking place in this space demonstrate that digital assets work technically. The most promising applications are primarily for asset classes that are currently less efficient than core securities such as listed equities and government bonds.

An official stated that tokenised assets were a theme in the 2023 BIS annual economic report. To allow a significant evolution towards digital assets and leverage the opportunities of tokenisation, the right infrastructures need to be in place. The idea is to go towards a 'unified ledger', where tokenised assets and central bank money can meet for handling transactions that are currently very expensive or not possible to execute.

The objective of asset tokenisation is not just having a digital representation of assets. It also offers the possibility of reviewing the rules and logics that govern asset transfers. Digital assets allow for example the simultaneous performance of actions, such as buying and selling, in one go and conditionally to certain events. There are many opportunities from the use of these new technologies for addressing inefficiencies in certain areas. One of these is supply chain finance and supporting suppliers involved in long distance trades. In an ideal world there would be payment upfront before processing a new order, but that is usually not the case in a cross-border environment. It is therefore hard for small and medium sized enterprises (SMEs) to compete with large companies in this area. With tokenisation there is the possibility to perform different actions in a contingent and simultaneous way and to integrate external data such as GPS data, leading to a more effective handling of such transactions and an optimised use of collateral. Tokenisation is also a way to build in trust where it is needed, provided a reliable settlement asset can be put into play. There is a preference for settlements in central bank money as it is safer and more effective. The BIS is experimenting with those issues, with several ongoing wholesale central bank digital currency (CBDC) projects, and the development of a dedicated environment comprising all necessary information to trade contingent transfers of digital assets on a unified ledger.

The official added that tokenisation and CBDC may also support the evolution underway in the financial services sector towards 24/7 services and instant delivery, and also increased requests for cross-border services. Customer expectations are indeed changing significantly and financial services delivered within two days will no longer be acceptable for future generations. It remains to be seen whether tokenisation will be the main solution, but such an evolution must be anticipated. Many changes are happening in the payments area in particular. There are around 65 fast payment systems in the world which are growing quickly, but they all cater for needs in only one currency. There are already attempts to connect those systems across borders to enable people to send money peer-to-peer (P2P) or platform-to-business (P2B) almost instantly. However, simply scaling up those platforms and maintaining

many connections across borders could result in a tangled system. BIS's Project Nexus is an attempt to solve that, with a gateway connecting multilaterally fast payment systems of different jurisdictions. BIS is working with an initial group of five central banks to build the gateway, and many more countries are advising on the project. However, a fast payment system in euros is still to be set up. Project mBridge is another pilot for a common system for making cross border payments feasible and issued by central banks. The current geopolitical developments are a challenge for building cross-border systems but the technologies will be used anyway, so it is better to try to develop such systems in a common, safe and transparent way.

## 2. Challenges and risks associated with digitalisation

An industry representative stated that a first challenge for banks is the cost of digitalisation and the validity of the related business case. There is a trade-off for many banks between investing in digitalisation in order to create more value in the future or using the corresponding capital to buy back shares, enhance immediate profitability or give it back to shareholders in the form of dividends.

A second challenge is the speed of change that can be imposed by some technologies and the fear of missing out, the industry speaker added. Everyone agrees that generative AI is potentially very disruptive and has an impressive pace of adoption. ChatGPT reached 100 million users within two months and became a top level agenda item for many banks in less than six months, being discussed at most boards and excos. Generative AI is promising for the industry, with the potential to improve the productivity of relationship managers by up to 40% and IT development by up to 60%. There will be a major competitive advantage for players who implement it in the right way, leading many bank CEOs to put top-down pressure on their teams to decide on an AI strategy. The risks associated with AI also need considering however, because the technology is immature. The models are still foundation models that could come up with unwarranted answers and expose banks to copyright issues for customer-facing use cases, as well as data leakage and defamation risks. A balance is therefore needed between quickly rolling out technology such as generative AI that has a significant transformational potential, and putting in place sufficient safeguards to mitigate risks, as well as the learning and talent needed to master that technology.

A regulator noted that the risks posed by new technologies in terms of fraud and misinformation could lead to an undermining of trust if they are not appropriately tackled. For example, scams have evolved using AI such as deepfake videos promoting investment scams. The increased reliance on third party service providers creates benefits but also new risks such as operational resilience risks and cyber threats. The increased connectedness across markets created by digitalisation and the cross-border dimension of critical third-parties, including cloud service providers (CSPs), also presents risks, including in terms of financial stability.

### 3. Adapting the regulatory and supervisory approaches to increasing digitalisation

The Chair asked panellists what policy responses would be helpful to strike the right balance in dealing with the risks and challenges from new technologies, while also benefitting from all the possibilities the technology brings. As mentioned for generative AI, while it is important not to hinder new developments that may potentially enhance the competitiveness of the financial sector, consideration is needed around the maturity of the technology and how it will evolve, also taking into account the insufficient level of data quality.

#### 3.1 The need for an adaptive regulatory framework

An industry representative stated that for traditional financial activities and products it has been possible to find a balance in most cases in the regulatory framework between responding to customer needs and preserving the integrity of the financial system. However, when it comes to technologies such as AI which are still in the making, it is not possible to impose hard rules from the start. Policy needs to first be principle-based, as the technology evolves and the industry progresses in its mastering of the technology. Imposing hard rules too quickly may lead to unnecessary restrictions or sanctions that may deter financial institutions from using AI. It is also important to ensure that policy work is globally coordinated in this fast-evolving area, because it is vital not to create any regulatory arbitrage or give a competitive edge to one geography over another. The Chair noted that the frameworks in place adopt a technology-neutral approach, which should help in this regard.

A second industry representative observed that the starting point should be a regulatory framework that supports the adoption of technology, but initiatives in Europe are not all conducive to that. Innovation is a journey, not a destination, and therefore regulation and supervisory practices have to evolve accordingly. That dynamic environment introduces challenges, as policymaking takes time, particularly in Europe. A further challenge at the European level is that a significant number of horizontal digital policies including the AI Act now coexist with more specific sectoral policies such as the Digital Operational Resilience Act (DORA). As the next mandate of the Commission arrives, it would be beneficial to take stock of the overall impact of the different initiatives put in place, both horizontally and sectorally, before engaging further changes.

A further challenge in terms of regulation, a third industry representative observed, is that the extent of the transformation happening with digitalisation and its unprecedented speed mean that the end stage is uncertain, as well as the path to get there. The path of evolution will moreover differ significantly across market players, depending on the type of business they are in and their legacy systems, so an evolving regulatory framework is needed. The regulatory framework should not aim to address the end game of digitalisation, but different milestones should be determined in terms of digitalisation and the regulatory framework progressively adapted to

those milestones. This will allow requirements to be changed over time, if needed, to adapt them to evolutions in the technology or in the way it is implemented and used in the market or to new incoming technologies. Taking the example of digital assets, not all players will be able to adopt them at the same speed. There will therefore be a need to run a digital infrastructure and a traditional infrastructure in parallel, probably for the next 15 to 20 years. The regulatory framework will need to take into consideration this gap because bridges will be needed between these different infrastructures. The discrepancy between some market participants who might be ready on the digital front and counterparties still transitioning towards new systems will bring some additional complexity for a period of time. The Chair added that another challenge is that the processes supported by a new technology and the existing processes transitioning to a new technology may need different types of supervision.

A regulator agreed that the regulatory approach needs to evolve in order to support ongoing technological change as well as likely future change. The regulatory approach has already adapted in the UK to take those evolutions into account. The FCA is clearly focused on outcomes-based regulation, and that should stand the industry in better stead for ensuring that regulation is technology-neutral. If the desired outcomes and the harms that regulators are seeking to prevent are clear, then it should help support future change and innovation.

#### 3.2 Taking evolutions of the value chain and market structure into account

An industry representative stated that regulation will need to adapt to evolutions of the financial value chain and market structure triggered by new technologies. There are many potential benefits from the breaking up of traditional value chains and the involvement of new players, such as efficiency, ease of use and cross-border development, but this raises challenges in terms of regulation and supervision that currently focuses on financial institutions. Further challenges come from the potential dematerialisation of infrastructure and increasing outsourcing to ICT providers which raise questions about the focus of regulation and supervision going forward. When taking the example of a structured finance bond issuance, it is unlikely that the same players will participate in the initiation and delivery of a bond in the future and that the processes will remain the same as today.

A Central Bank official suggested that a key feature of digitalisation is the fragmentation of the value chain and an increasing number of tasks due to be performed by unsupervised third-party providers and algorithms. The emergence of new categories of players in the financial sector is a challenge for supervisors used to dealing with more traditional financial players. But the challenge from the developing role of algorithms with AI driven decisions and self-executing smart contracts may be more significant, as it may lead to an evolution towards a new kind of 'driverless, autonomous' finance, with risks shifting from humans to algorithms. In principle the overall responsibility remains with the managers of the bank, but that may be difficult to enforce if algorithms function autonomously in the context of end-to-end processes. It is currently unclear whether that leads to a risk reduction or

a risk increase, but the challenge for banking supervision is significant, because the priority may be technological supervision in the future rather than financial supervision.

An industry representative noted that while AI systems and algorithms may be making many decisions in the future, behind them there are humans who have coded and trained them, that need to be effectively controlled.

An official agreed that in the current world it is not enough to only understand what is happening in economic and financial terms; an understanding of the technology side and how it changes operational processes and customer preferences is also vital. The Innovation Hub of the BIS is collaborating with central banks to explore how the public good can be built in this regard, notably to meet their objectives on monitoring financial stability.

A regulator noted that there is a programme of work ongoing internationally on digital operational resilience and the risks from critical third-parties. In the UK, part of the recently passed Financial Services and Markets Act gives the UK Treasury the ability to designate critical third parties, which will then come under the remit of the Bank of England and the FCA. They will be responsible for regulating the services provided by critical third parties to the financial sector from an operational resilience and financial stability standpoint.

The Central Bank official observed that there is a similar approach in the EU with the DORA regulation, aiming to tackle the risks from critical third-parties such as CSPs. The concept of third party provider may be too narrow however for such players, because CSPs are becoming an integral part of the future digital infrastructure due to support digital assets in particular. DORA is not yet a sufficient answer to the fundamental importance of that infrastructure for the digital transformation of the financial sector.

### **3.3 A more collaborative and customer-oriented approach to regulation and supervision**

In response to a question about the potential impacts of the use of new technologies on supervision, a Central Bank official suggested that adapting the policy approach and supervision to innovations in the market is a common journey for the authorities and the industry. New forms of regulation need issuing to address the opportunities and risks from digitalisation and supervision needs to evolve, but it is also up to the industry to adapt to these changes and interact with the authorities to ensure that policy measures and supervisory approaches are appropriate. Different authorities also have different approaches to these evolutions, with supervisors focusing more on the risks and central banks considering market impacts in a more holistic way in terms of efficiency and stability.

An industry representative agreed that supervisors and regulators need to work closely with the private sector to understand the implications of new technologies – i.e. which parts of the financial sector are impacted, what the associated risks are – and to design the supervisory framework together to ensure that the integrity of the financial services system and consumers continue to be protected. From a supervisory perspective it is vital in

particular to understand the implications and impacts of new technologies such as generative AI and their on-going evolutions in order to ensure that companies are not blindsided in their use of this emerging technology.

A regulator stressed that effective outcomes focused regulation is needed to address technology-related developments. It requires good collaboration and partnership between policy-makers and industry. The FCA is looking to build much greater engagement with industry and potential users. It is important to consider the impacts both for industry participants and consumers, because the trust element is essential in this context. In addition to conducting consultations and gathering feedback on policy proposals, regulators need to move towards an evidence-led approach and collect input on the potential impact of policy options early in the process. This can be done by convening industry and consumer groups and making greater use of existing statutory panels.

The regulator added that testing is also a key factor in this context. The FCA has a well-established digital sandbox, which has supported 867 firms since its inception in 2014 and is now permanent. This has enabled successful testing of many new products and product evolutions. Another objective for regulators is creating sufficient space in the regulatory agenda to deal both with future innovations and existing activities. Finally, there is a further area of reflection about how supervisors and regulatory authorities can use technology to perform their own supervisory activity and address market risk in a more effective way.

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## **4. Wrap up**

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The Chair summarised that while significant impacts from digitalisation are anticipated, changes are not yet happening all at once and across all financial activities. It is a progressive journey of change. The outcome is still uncertain, as to whether it will lead to autonomous products functioning on unified ledgers for example, or whether value chains will end up being further disintegrated with third parties being part of the supervised community.

The industry is adapting to benefit from the competitive advantages of technology, which raises questions around how policymakers and supervisors should evolve their approach to strike the right balance between supporting innovation and mitigating the related risks. The panel generally supported the need for principle-based and outcomes-based approaches to policy in this area due to the speed of innovation, and emphasised the importance of international cooperation due to the cross border dimension of digital activities. Supervision has also to adapt to 24/7 business and is increasingly a consumer-focused activity. Testing and interacting with the market and consumer representatives is important in this respect. Supervisors will also need to supervise the development of a new digital world of finance, while overseeing traditional activities in a transitioning process.