

The geopolitics of digital financial technologies

A chance for Europe?

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Clingendael Report



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The Clingendael Institute
P.O. Box 93080
2509 AB The Hague
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About the authors

Brigitte Dekker is a Research Fellow at the Netherlands Institute of International Relations 'Clingendael' in The Hague. Her research focuses on various dimensions of EU–Asia relations, with a specific interest in Southeast Asia and China. Her research revolves around the nexus between trade, technology and geopolitics.

Arief Hühn is a Senior Researcher and Team Leader at FreedomLab think tank in Amsterdam. He researches emerging technologies and their broad impact on society and global power relations. He has a special interest in decentralizing technologies (including blockchain, web3 and cryptocurrencies) and new user interfaces.

Pim Korsten is a Researcher and Strategist at FreedomLab think tank in Amsterdam. He researches how technological innovations incubate new economic and political models, such as for sustainable economics of new forms of governance. His main interests are the philosophy of history and economics, the impact of digital technology on our daily life and metamodernism.

Maaïke Okano-Heijmans is a Senior Research Fellow at the Netherlands Institute of International Relations 'Clingendael' in The Hague and a Visiting Lecturer at the University of Leiden. Her main research interests are connectivity, economic diplomacy and international relations in EU–Asia relations, with a special focus on China and Japan.

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Executive summary

The development and adoption of digital financial technology (fintech) has experienced immense growth in the last five years, especially during the COVID-19 pandemic. Today, competition between fintech companies and traditional financial banks is intensifying in the European Union. Simultaneously, two trends are disrupting the financial industry: the first, in which foreign Big Tech players such as Amazon, Google and Alibaba are encapsulating numerous fintech applications; and the second, of decentralized finance (DeFi), wherein technology innovators are building a radically new, global and open-source infrastructure as an alternative to our financial system.

This Clingendael Report assesses these trends from a geopolitical perspective, gauging the consequences in three fields: (1) economic competitiveness and innovation; (2) financial-economic and social stability; and (3) inclusivity and equality. Building on these insights, the authors argue for a push towards greater awareness among European policymakers on the pros and cons of DeFi, and on the need to elevate citizens' digital skills to withstand the pressure of Big Tech companies. Through a multi-stakeholder approach, enhanced dialogues with officials and technology company executives in like-minded countries on current developments can help ensure that security and privacy concerns are considered at the technology design phase. Governments can thereby better balance innovation, regulation and geopolitical interests.

Introduction¹

Geopolitical tensions are permeating the digital domain. During the 1990s, the emergence of the internet still involved optimism and high hopes for digital technology as a force for openness, connectedness and freedom for all.² Yet contrary to these promises, a trend of centralization is prevalent in the digital economy. A few internet platforms are dominating services and supplying critical digital infrastructure, harvesting huge amounts of consumer data while keeping these datasets for themselves. These platforms are thereby stifling innovation by and scale-up from other companies, while benefiting from a huge concentration of power and intelligence. Key examples of this are Amazon's and Alibaba's strongholds of the e-commerce sector and cloud computing, Alphabet and Baidu's dominance as search engines, Meta and WeChat for messaging, and Microsoft and Tencent as leading technology product providers and service providers.

This trend of centralization, with the subsequent problems of gatekeeping, ecosystem lock-in, disproportional rent-seeking and monopolists that set market rules, is now also evident in the financial industry. Whereas smaller fintech companies, including many European firms, revolutionized the sector in the 2000s – disrupting traditional banks and their vested interests – we now witness a concentration of power and data in this sector, either in incumbent firms or within Big Tech companies.

In response, governments in China, the European Union (EU) and the United States (US) are devising regulations, while at the same time technology innovators are building a radically new infrastructure to underpin our financial sector: decentralized finance (DeFi). This global, open alternative to our financial system is characterized by decentralized, open-source technology. This means that there are no centralized financial authorities that create and manage the current system and function as arbitrators. Instead, the system relies on open-source, distributed, consensus protocols. On top of this decentralized infrastructure, cryptocurrencies are the network's means of exchange and tokens of value creation.

1 This report draws on discussions held by the Digital Connectivity Network, hosted in 2021 by the Clingendael Institute with the support of FreedomLab, for officials from various Dutch ministries and representatives of the private sector and civil society. The authors would like to thank all participants in this network for their valuable input.

2 Leaders, ['The promise of open-source intelligence'](#), *The Economist*, 7 August 2021.

On the positive side, the open and permissionless nature of innovation means that gains and innovations cannot be appropriated by organizations through monopolistic and rent-seeking activities (for example, based on information asymmetry or the market), but instead benefit the whole network. This creates a level playing field for European start-ups and citizens, as users are fairly compensated for their data, while at the same time creating a more open data economy for corporations. DeFi thereby holds potential for Europe to counter Big Tech's rising influence in the European financial system with a decentralized, human-centred and value-based system.

However, DeFi also brings new risks by disrupting current business and organization models, escaping traditional government control and by giving room to illegal practices such as illicit trade, money laundering and tax evasion.

The geopolitical implications of this disruptive transformation of the financial sector – through both fintech and DeFi – require forward-looking government responses that protect and promote European interests in the long term.

This Clingendael Report first reflects on these trends of centralization in digital finance and decentralization in 'traditional finance'. The paper examines the relationship between geopolitics and finance and looks at the position of the EU and its member states. The analysis considers the medium to longer-term implications in the following three domains: (1) economic competitiveness and innovation; (2) financial-economic and social stability; and (3) inclusivity and equality. Data governance, data protection and data portability between financial services are key concepts in each of these areas.

Building on these insights, the report argues for a push towards greater awareness among European policymakers on the potentials of DeFi, and on the need to help people to develop digital skills and become responsible and resilient digital citizens. It also calls for enhanced dialogues with officials and technology company executives in like-minded countries on current developments. New approaches, such as multi-stakeholder consultations and increased rapprochement with the open-source and crypto-communities, are needed to facilitate knowledge exchange and best practices that will improve (regulatory) responses.

Fintech disrupting the financial industry

In recent years, a convergence of various innovations³ has led to disruption of the traditional financial industry. With the datafication of our living worlds and digital-consumer practices, digital technology companies in the financial industry – i.e. fintech – emerged in the early 2000s.

Today, Europe is home to a flourishing fintech landscape, with 31 European fintech unicorns representing around 25 per cent of all fintech unicorns globally.⁴ While the UK is home to the second largest community of fintech unicorns after the US, the fintech sector is by far the most prominent start-up sector in the EU – particularly in the Nordic region, France and the Benelux countries.⁵ From 2020 onwards, fintech start-ups and scale-ups accelerated even further, as COVID-19 demanded increased cashless payments and digital (financial) services.

Over the years, fintech companies developed new financial consumer-oriented services, offering faster, cheaper and more accessible digital-financial user experiences. Common examples of fintech include mobile banking, investing and borrowing services, cryptocurrencies and artificial intelligence (AI)-driven advising services. The rise of fintech companies was accompanied by the same optimism and high hopes as with the first internet companies, by providing cheaper credit and access to financial services for the masses, while dismantling the power of large monopolistic financial institutions.

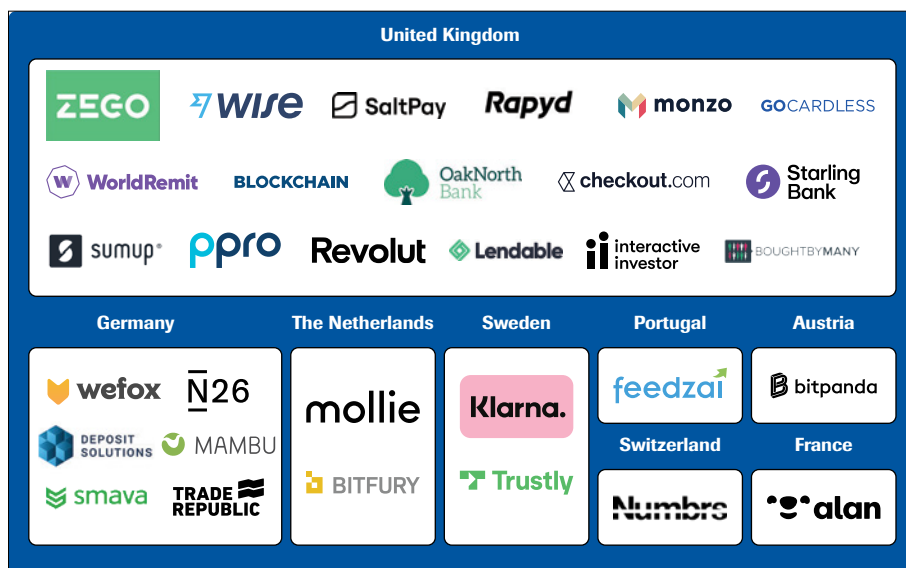
In general, fintech is seen as encapsulating technological innovations that seek to replace traditional financial services and disrupt incumbent institutions. However, these fintech companies have not only disrupted existing financial institutions and their gatekeeping function that enables them to reap a profit. Over time, traditional financial companies have started to integrate fintech companies or their solutions, for example by acquiring them or copying their ideas within their centralized ecosystems.

3 For example, working on cloud infrastructure to store various groups and sources of data; using more immersive (e.g. touch screens on smartphones) and ubiquitous interfaces to reach potentially billions of users and to capture huge swaths of consumer data (e.g. satellite data, digital searching and buying behaviour); and leveraging the power of improvements in AI (e.g. neural networks to analyse unstructured consumer data).

4 Isabel Woodford, [‘There are now 30+ fintech unicorns in Europe. Who are they?’](#), *Sifted*, 8 June 2021.

5 [‘fintech deals in continental Europe’](#), *PWC*, March 2021.

Figure 1 European fintech start-ups worth over \$1 bn (as of 8 June 2021)



Source: [There are now 30+ fintech unicorns in Europe. Who are they? | Sifted](#)

Furthermore, fintech is the latest sector – following chat services, media, marketplaces and various other digital services – to be absorbed by Big Tech. Companies such as Amazon, Facebook, Tencent and Alibaba have embedded financial services to make their own products and services more attractive, either by leveraging their huge amounts of user data and/or by acquiring fintech players in their own ecosystem along the way.⁶ As so-called ‘TechFin’, they are creating a new revolution and centralization in the traditional financial sector, also in Europe.⁷

In response to the trend of centralization, different answers from governments and other stakeholders, specifically tech innovators, can be distinguished. Regulators in the large power blocks – China, the US and the EU – are coming up with regulatory responses. Recent examples include the EU’s Digital Markets Act, which aims to reign in powerful digital gatekeepers, and China’s crackdown on Chinese digital platforms. Simultaneously, a technologically driven response in the shape of decentralized finance aims to develop a devolved version of the financial sector with the help of radical new infrastructure.

6 Hans Brits, Gé Cuijpers, Nicole Jonker, Melanie Lohuis, Ria Roerink, Coen ter Wal and Annelotte Zwemstra, [‘Veranderend landschap, veranderend toezicht’](#), De Nederlandsche Bank, 24 June 2021.

7 Jessica van der Schalk, [‘Will TechFin cause the next disruption in the financial sector?’](#), FreedomLab, 28 September 2018.

The emergence of decentralized finance

Decentralized finance – or DeFi – also offers financial services such as lending, insuring, borrowing, investing and trading, but sets itself apart from traditional fintech by providing unique characteristics because of its decentralized nature. First, on a governance level, DeFi does not rely on central trusted third parties to retrieve, verify, settle and secure transactions and govern the network, but instead makes use of a distributed ledger (e.g. blockchain) ruled by a distributed consensus protocol. Based on a combination of game theory and cryptography, these consensus protocols incentivize network participants to maintain, collectively, the integrity of the system.

From a market-perspective, this means that these DeFi can sidestep issues such as gatekeeping, lock-in, de-platforming, disproportional rent-seeking and anticompetitive rulemaking, which are usually introduced by central intermediaries with vested interests. Second, the open and permissionless nature allows for any user with an internet connection to participate, thus spurring open innovation on the developer side, as any programmer in the world can contribute to improving codes or can build applications. Third, DeFi services are truly global, since their decentralized nature does not tie DeFi to any particular geographical location.

Furthermore, these DeFi protocols make use of cryptocurrencies and set terms of agreements directly between network participants that can be automatically executed when terms are met (by way of smart contracts). Powered by the underlying decentralized, open and global infrastructure, cryptocurrencies and smart contracts lead to the following benefits: (1) full transparency – everyone can see the code and transactions and verify them independently; (2) efficiency gains – ‘code is law’ so there is no room for misinterpretations or discussions; (3) higher security – as one group does not hold control over the others; and (4) offers finality – since the blockchain architecture ensures that records remain immutable. Cryptocurrencies and smart contracts are hence important building blocks in creating DeFi applications.

These characteristics, however, describe DeFi in its ideal form. Unfortunately, DeFi is still nascent and most projects have yet to prove that all these promises can be achieved without detrimental trade-offs. For example, most DeFi projects deal with the ‘blockchain trilemma’, in which it is hard to optimize for either decentralization, security or scalability without affecting the other two negatively.

Although the DeFi space is still fairly young, apps that rely on decentralized technology (dApps) are rapidly emerging. These include decentralized payment, exchange, lending and derivatives services. In 2018, for example, a total value of 1 billion US dollars was deposited in underlying smart contracts; in 2021, the value deposited in smart contracts had risen to 100 billion dollars.⁸

Next to the opportunities offered by the open-source character of DeFi, this new form of finance also comes with challenges, especially for financial regulation. Decentralized networks tend to escape centralized control, meaning that governments currently can only regulate the centralized touchpoints (i.e. on- and off-ramps) of these systems, such as fiat-backed stablecoins and exchanges.⁹ Furthermore, the borderless nature of DeFi is challenging the existing financial system, as regulation has been crafted on the idea of separate financial jurisdictions.¹⁰ These challenges are especially problematic when it comes to money laundering, illegal trade and tax evasion, but also negative externalities such as the energy consumption of various cryptocurrencies. Acting on these concerns, the Chinese government recently imposed a ban on crypto mining,¹¹ while the US introduced new reporting requirements on cryptocurrency brokers and published an alarming report on stablecoins.¹²

However, going forward there is also the possibility that regulation could benefit from decentralized technology. For instance, monitoring, reporting and compliance could be automated and take place in near real-time using blockchain and smart contracts. On the enforcement side, regulators could scale their operations by making use of machine executable regulation, with which DeFi applications can interface to gain automatic approval. This shows that decentralization accelerates not only the transformation of the financial sector but is also inducing change in the way the sector is regulated.

8 Total locked-up value on 13 December 2021, <https://defipulse.com/>.

9 Fiat money is currency backed by a country's government or central bank. Fiat-backed stablecoins thus reduce the price volatility normally associated with cryptocurrencies by being pegged to and maintaining reserves in a specific fiat currency, such as the US dollar or euro, while still offering the speed and security advantages of blockchain.

10 Rakesh Sharma, '[Decentralized finance and why it matters](#)', *Investopedia*, 24 March 2021.

11 Grady McGregor, '[China already banned Bitcoin mining—now it's cracking down on holdouts](#)', *Fortune*, 17 November 2021.

12 Joanna Ossinger and Anchalee Worrachate, '[Bitcoin drops most since September in broad retreat from records](#)', 16 November 2021; and '[Recommendations on stablecoins](#)', US Department of the Treasury, 1 November 2021.

DeFi and geopolitics

The current period of an innovation ‘wild west’ resembles the development of the internet in the early 1990s, after which regulation caught up and its economic and social impact became clear. Regulators and governments should now adopt a forward-looking stance and see through current dynamics to the future opportunities that could emerge from such a radically different infrastructure and subsequent decentralized applications and services. Eventually, such a forward-looking stance could lead to new best practices, rules, standards and norms.

Financial power and wealth have always been closely related to geopolitics and foreign power projection. Think about the ‘exorbitant privilege’ for the United States of the US dollar being the world’s reserve currency and subsequently the US’s influence on the global payments system SWIFT.¹³ Likewise, China seeks to bolster its financial statecraft with a digital yuan, as part of its strategy to draw countries into the orbit of its Belt and Road Initiative and to monitor transactions involving the digital currency, as well as – together with other countries such as Russia – to circumvent American financial sanctions.¹⁴

Therefore, the rise of fintech, the entry of Big Tech into the financial industry and the trend towards DeFi must be considered in their proper geopolitical context. Depending on local circumstances, the responses by governments and regulators in various jurisdictions diverge.

Particularly in the EU, which boasts one of the most advanced and regulated financial systems, fintech companies and DeFi are challenging the role and position of traditionally strong banks.¹⁵ Established banks have always dominated the entire ecosystem of the financial sector and have been the sole provider of most financial services. Europe’s banking population hit 410 million in 2019, meaning that more than 92 per cent of EU citizens has access to a bank account.¹⁶

Prior to the 2015 EU Digital Single Market Strategy for Europe, regulatory and supervisory responses to fintech primarily focused on supporting growth and adaptation. By then, concerns had grown over the increasing reliance of citizens and businesses on (fintech)

13 Leaders, [The geopolitics of money is shifting up a gear](#), *The Economist*, 23 October 2021.

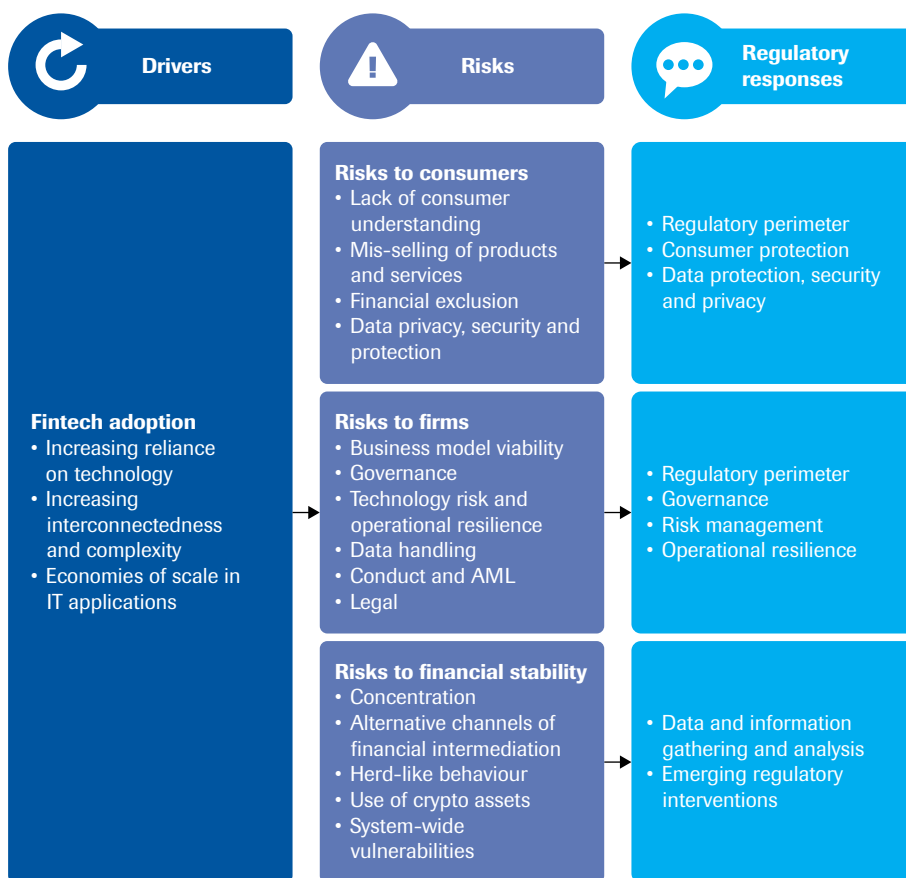
14 [Digital yuan gives China a new tool to strike back at critics](#), *Bloomberg News*, 20 April 2021.

15 Willem Röell and Christian Godlieb, [‘Netherlands: fintech laws and regulations, 2021’](#), *International Comparative Legal Guides*, 14 June 2021.

16 [‘Europe’s banking population hits 409.46 million’](#), News, *The Paypers*, 22 May 2020; [‘The global Findex database 2017’](#), World Bank, 2017; and F. Norrestad, [‘Share of unbanked population worldwide 2021 by country’](#), *Statista*, 7 December 2021.

technology, and the growing complexity of the financial sector that came with the market entry of large numbers of non-traditional financial players.¹⁷ As visualized in Figure 2, this raised potential risks for consumers, firms and the financial stability of economies. The European Banking Authority sought to mitigate these risks and worked with the European Commission to establish standards for fintech in Europe – leading to the publication of the EU Digital Finance Package in September 2020. This strategy and legislations aim to create a competitive EU financial sector that enables consumers to access innovative financial products while their privacy is guaranteed.¹⁸

Figure 2 Fintech regulation in the EU: drivers, risks and regulatory responses



Source: [Regulation and supervision of fintech: ever-expanding expectations](#), KPMG, March 2019.

17 [‘Regulation and Supervision of fintech: ever-expanding expectations’](#), KPMG, March 2019.

18 [‘The EU digital finance package’](#), European Commission, 24 September 2020.

Curbing Big Tech's financial rise

Stronger regulation of Big Tech's financial innovations and power is still primarily visible outside Europe, as the EU is struggling to combine the different digital regulatory frameworks in areas of competition, consumer and data protection.¹⁹ From 2020, the Chinese government stepped in to regulate Big Tech companies, such as Alibaba's Ant Financial, demanding greater access to data collected by these companies through its cybersecurity regulation and forcing them to break up when they became too big to govern. Government access to financial data can facilitate preventive monitoring of criminals or protests based on financial data, and enable the use of financial tools as a power tool, for example by blocking someone's bank accounts or preventing a company from making transactions in foreign currencies. Furthermore, the Chinese state is seeking to control or even ban DeFi by prohibiting miners and crypto-exchanges in China, as DeFi is seen as a threat to its oversight and control over the financial industry. The Chinese approach to regulation focuses on controlling Big Tech and DeFi and preventing these firms from becoming too powerful and thereby rivalling the Chinese Communist Party's power in critical services and infrastructure. As such, it contrasts with the EU's principles-based approach to regulation, which aims for transparency, fair markets and openness.

On the other hand, American interests and regulatory frameworks are also not in line with those of the EU. In the US, regulators – such as the Securities and Exchange Commission and the Federal Reserve System – are more lenient towards Big Tech companies and fintech solutions. Instead, they accelerate efforts when these innovations interfere with US monetary policy (e.g. Stablecoins, or labelling crypto as a new class of securities for consumer protection) and other geostrategic interests of the established American financial sector.²⁰ The US government thus adheres to a hands-off approach, moving along with innovations from industry, but halting efforts when these jeopardize macroeconomic and broader financial interests. As such, American companies' vested interests will make the US an unlikely partner for the EU as well.

In contrast to these approaches, the EU is prototyping new legislation that aims to embed European values related to technology – in particular, privacy and a fair and inclusive digital economy. The EU is currently doing this by regulating existing

19 Vincent Manancourt and Samuel Stolton, ['Europe's fractured approach to digital regulation stymies fight against Big Tech'](#), *Politico*, 16 November 2021.

20 ['The Big Tech in fintech report: how Facebook, Apple, Google, & Amazon are battling for the \\$28.2T market'](#), research report, *CB Insights*, 17 June 2021.

technology and digital services. Take, for example, the sector-agnostic Data Governance Act for data-sharing, as well as the Digital Market Act, which aims to create level playing fields for smaller European technology companies. This is principle-based from a democratic and normative perspective, but also in the EU's own interest: Europe lacks Big Tech, and this approach helps to protect Europe's incumbent but 'traditional' financial sector.

Simultaneously, the EU is pushing its 'ethics by design' approach, in which ethics and values, as well as security and human rights considerations, are incorporated in the technology design phase, for example in artificial intelligence.²¹ Creating open, fair and transparent digital markets and a data economy is an EU priority, also relating to the financial sector and financial technology. This approach would complement EU efforts to regulate existing technologies, and would be a powerful step towards building on a human-centred digital domain that ensures openness, transparency and digital rights.

Because of the large size of its market, EU policies also have a large impact in other parts of the world, since they affect foreign companies that work within EU borders. With this 'Brussels effect', the EU has the chance and scale to implement its vision across its borders.

Interestingly, the DeFi space also shares many of the values and principles that are reflected in the EU's human-centric approach and its digital single market strategy, including data sovereignty, open innovation, interoperability and multilateralism. Herein lies an opportunity for the EU to guide the development process of DeFi to ensure that these values are realized according to European norms and standards. This can be done via active collaboration and counselling with engineers and communities who are working and developing this decentralized, soft infrastructure of digital finance, for example about protocols and smart contracts for data exchange, data ownership and the codified and agreed-upon terms and conditions of digital transactions between users and platforms.

A multi-stakeholder approach that brings together the global open-source and crypto-communities, engineers and developers, European start-ups and companies and national regulators can help in reaping the opportunities of DeFi and mitigating its challenges (as elaborated below). Starting with sharing best practices, input for future regulation could also be collected over time. Furthermore, by facilitating knowledge exchange, enhanced dialogues among stakeholders can help to leverage the power of DeFi for the European economy and the decentralization trend in general.

21 European Group on Ethics in Science and New Technologies, '[Values for the future: the role of ethics in European and global governance](#)', European Commission, May 2021; and '[Excellence and trust in artificial intelligence](#)', European Commission, April 2021.

Traditional financial institutions and companies should also be included in these dialogues, although their willingness to cooperate is questionable, since DeFi disrupts their business models and is hence not in their (short-term) best interest. Internationally, the EU's Next Generation Internet (NGI) initiative and the France-led Emerging Valley programme, which pushes EU–African technology collaboration, are good examples of cross-border, multistakeholder cooperation that can be augmented.²²

22 See: [Next Generation Internet](#) and [Emerging Valley 2021](#).

Implications of the geopolitics of fintech in Europe

The EU and its member states are only at the beginning of a profound reconfiguration of the financial sector. Today, their focus is on competition between fintech companies and the traditional European financial sector.²³ In the medium to longer term, the broader geopolitical consequences of ongoing digitalization, as well as decentralization of the financial sector, should be their core concern. Debates about data governance, the use of infrastructure (such as cloud networks), and centralization (coming with the growing influence of Big Tech) versus decentralization of finance, will dictate discussions in the financial sector. Outcomes will hold consequences for many policy domains, as they shape (1) economic competitiveness and innovation; (2) financial-economic and social stability; and (3) inclusivity and equality.

1. Economic competitiveness and innovation

The EU acknowledges the importance of the fintech industry as a major driver in the digital transformation of the economy, manifested in its latest regulation on the digital economy. However, European fintech companies still struggle to acquire investment and funding in the start-up and early scale-up phase.²⁴ The lack of European awareness and investment in the fintech sector contrasts starkly with the vast interest of Chinese and US investors and the number of successful small fintech companies in Europe. European fintech firms have attracted an influx of cash from US and Chinese investors, thanks to the mounting success of first-generation European fintechs. These foreign investments have led to ten new unicorns in the fintech sector in 2021 alone, but thus come with strong foreign influence and ownership.²⁵

These foreign investments assist the scale-up and global growth of European fintech companies on the one hand, but they also put at risk European digital sovereignty and economic competitiveness – another core priority of European regulation. As European fintech companies gradually become part of the US and Chinese ecosystems, these Big Tech platforms will increasingly determine the rules of digital finance. This could

23 Willem Röell and Christian Godlieb, '[Netherlands: fintech laws and regulations, 2021](#)', *International Comparative Legal Guides*, 14 June 2021.

24 '[fintech investments in continental Europe: developments up to 1H20](#)', PWC, November 2020.

25 '[The complete list of unicorn companies](#)', *CB Insights* (cbinsights.com).

compromise the EU's ability to safeguard the human-centred approach for technology that it seeks to promote. Examples include privacy issues when collecting data, as well as specific guidelines on how to raise and allocate capital towards companies and industries. Second, without strong players in digital finance, Europe will be hard-pressed as a standard-setter and norm entrepreneur in this domain in third markets – notably with the rapidly growing e-economies in the Indo-Pacific region.

Separately, unfair competition by Big Tech companies for banks is a cause for concern. First, because it undermines the economic competitiveness of smaller fintech companies; and second, because it puts the long-term financial stability of existing financial institutions at risk, by undermining their revenue model. Today, Big Tech companies commonly enter the market as non-licensed technical service providers, cooperating with a licensed actor, such as a traditional bank, to offer payment services. This benefits Big Tech companies, as they can expand their ecosystem but need not comply with the 2019 European Payment Services Directive (PSD2). This directive enables users to allow third-party access to individuals' payment details and dictates that financial institutions must provide access to payment systems based on objective, non-discriminatory and proportionate conditions.²⁶

DeFi has the potential to be an important economic opportunity for Europe, as it provides a decentralized, soft infrastructure that enables data-sharing and data ownership. This creates a level playing field for European start-ups and citizens, as users are fairly compensated for their data, while at the same time creating a more open data economy for corporations. In combination with open-source development, DeFi could provide an important future opportunity for incubating a European innovation ecosystem, which is also in line with the strategic imperatives of the Data Act, and as a countervailing power against Big Tech.

However, DeFi requires a different strategy compared to 'traditional finance', as companies can no longer capitalize on monopolized user data and intelligence, and gains are more evenly distributed across parties in the network, as there is no central rent-seeker position. Instead the EU should create a first-mover advantage by building up knowledge and expertise to create a strategic position in the DeFi space. DeFi is a blue ocean, with vast potential to incubate new forms of innovation and earning capacity, particularly since the underlying infrastructure is global, open, distributed and therefore trusted (unlike that of US Big Tech platforms or fears about Chinese interference and control by the state). Another strategic consideration is that DeFi

26 PSD2 enables third parties to access financial accounts within the EU, provided that the consumer has given consent to the company. The third party is then able to check the account's balance, collect information from the payment account and give an overview or instruct the bank to make a transfer on the consumer's behalf.

could level the playing field in the European digital economy, even if it could cannibalize on Europe's well-established financial sector.

2. Financial–economic and social stability

International upheaval concerning the inclusion of fintech into Big Tech companies' ecosystems can primarily be attributed to concerns about so-called 'surveillance capitalism', where Big Tech companies commodify personal data solely for profit-making purposes. Allowing these companies to have access to financial data will further expand their already large datasets, potentially enhance digital surveillance, infringe on users' privacy, and monopolize whole ecosystems. Financial data can, for instance, provide insights into how healthy people live by seeing what products they buy, whether they are financially at risk because of their income and spending patterns, or are likely to engage in criminal activity when observing abnormal financial transaction fluctuations.

Yet stability concerns arising from the digitalization of finance are broader and also include the financial well-being of individuals and the stability of the financial system. Specifically, when financial services are offered to consumers jointly by Big Tech and financial institutions, such hybrid forms of cooperation may result in lack of clarity about who is responsible for compliance, codes of conduct and so-called duty of care to customers.²⁷ Furthermore, Big Tech companies can not only use large datasets to know users' behaviour and launch extremely accurate advertisement campaigns, but they can also actively shape users' behaviour for the companies' benefit. These companies can now collect and connect even more (non-)personal data to create optimal customer experiences within their own ecosystems.²⁸ Adding financial data to their datasets will enable Big Tech companies to shape behaviour even more, by utilizing users' data to gain yet more influence in the public domain.

In contrast with digital platforms that provide financial services, financial advisers have rules to prevent deliberate mis-selling or providing misleading information, and to ensure that the advice they provide is full and accurate. The lack of regulation of digital platforms poses risks to the (financial) well-being of individuals. As such, it is important for European regulators to track consumer adoption of fintech services, as users might gain access to easy-to-use financial products and services, while lacking the financial literacy to make prudent decisions. For example, digital lending might lead to large debt burdens for consumers who are unaware of the consequences, while gambling and financial speculation could leave people at financial risk. The potential global ramifications of such irresponsible financial behaviour and the ignorance of individual

27 Hans Brits *et al.*, '[Veranderend landschap, veranderend toezicht](#)'.

28 Hans Brits *et al.*, '[Veranderend landschap, veranderend toezicht](#)'.

investors and consumers about the financial system were most clearly exposed by the financial crisis of 2008, which revealed the Ponzi schemes that had ensnared many investors, citizens/households and home owners.

DeFi also counters this trend by decentralizing the financial infrastructure in such a way that no single party can change entries in the financial track record and history (the so-called ledger), or determine the terms and conditions of financial transactions and facilities. As such, the system is much more resilient to the behaviour of any large company (such as major banks determining credit conditions) and protected against top-down interference (for example, monetary policy changes). Again, the financial crisis following the 2008 fall of Lehman Brothers shows how society and the economy at large are at risk when the financial sector is reliant on a few large, but irresponsibly acting, organizations. On the other hand, however, DeFi brings different systemic risks, as the anonymity of users makes cryptocurrencies interesting for criminal transactions, while the impossibility of setting and changing the rules of the game in times of crisis or uncertainty could prevent socially beneficial interventions.

3. Inclusivity and equality

An inclusive digital domain and a human-centred approach are at the heart of the EU's digital agenda. Digital identity management and data sovereignty are key enablers in promoting this set of values for the financial sector, and could support the EU's role and influence as a global standard-setter. At the same time, citizens' knowledge and enhanced digital skills are needed to withstand pressure from Big Tech as dominant fintech players. Without knowledge of the potential privacy and security risks, citizens will be unable to make an informed choice, especially when this choice is presented in the form of giving consent by simply checking a box.

A European-wide digital identity and Data Governance Act are now in the making.²⁹ These will be important tools to empower European citizens, enabling them to manage their own data in safe and decentralized spaces – including in the financial system. With their digital identity, individuals can choose which personal data they want to share with third parties such as government institutions and businesses operating within the EU, and keep track of such sharing. This will also benefit fintech companies, which can more easily obtain valuable user data when freed from the data silos of either Big Tech or financial institutions, thus boosting solutions outside of Big Tech and offering new financial services.

29 [European digital identity](#), European Commission, 28 May 2021; and [EU looks to make data-sharing easier: Council agrees position on Data Governance Act](#), European Council, 1 October 2021.

Another instrument to help citizens implement their rights and to promote the EU's human-centred approach in the financial sector is data sovereignty. This refers to the ability of consumers to control their data (whether it is the ability to port their data to any service of their liking, to keep their data private, or to earn fair compensation for use of their data), as well as consumers' ability to share data on specific terms and conditions that they agree upon. This would also lead to more seamless integration of various digital services, including financial services, around an integrated and interoperable ecosystem.

The example of WeChat illustrates the power of these mega-ecosystems, or 'super apps', driven by financial services.³⁰ In a broader sense, these provide huge opportunities for developing countries to 'leapfrog' into digital consumer services, especially as financial infrastructure is undeveloped and people are often unbanked. A good example of this is India, which has invested in digital, rather than traditional financial infrastructure, to boost financial inclusion. In a technology-led model, the Indian government has prioritized the creation of enabling infrastructure – such as digital identification and payments technology – on which the private sector can build.

DeFi holds similar potential, as it provides an open and global infrastructure in which users make use of digital services and currencies. This provides opportunities for countries to circumvent the centralized financial ecosystems of either private Big Tech or public states, and tap into a global market of developers, engineers and consumers. For instance, DeFi enables countries to leapfrog over traditional financial infrastructure, and start-ups to share and use data that is generated across the network, thus boosting the innovation capacity of local economies. For European companies and countries, the inclusion of emerging markets and their users creates huge, addressable potential markets for their services and products, while first-mover advantages could make Europe a rules-setter by creating protocols and norms by which these countries can innovate.

30 Chinese WeChat is a multi-purpose platform that allows its users to stay within the App for all kinds of services, including messaging, e-commerce, ride-hailing and meal delivery. All transactions are underpinned by WeChat's own financial technology services, WeChat Pay.

Towards a European way of fintech and DeFi

The EU has a strong, developed financial sector. The depth, access and efficiency of its financial institutions and markets made the EU a global leader, with a notably higher financial inclusion rate in the EU than elsewhere. fintech companies revolutionized the sector in the 2000s, disrupting incumbent parties and their vested interests by creating faster, cheaper and user-friendly digital services. Today, we are witnessing a concentration of power and data, either in incumbent financial firms or within Big Tech companies.

While fintech has enabled consumers to have more personalized and digital experiences, the digitalization of finance comes with vast consequences for data protection, privacy and stability – in particular as governance structures have not caught up with new realities. Non-democratic governments in particular will seek to benefit from access to financial data, for the preventive monitoring of criminals or protests based on financial data, or to use financial tools as a power tool, for example by blocking someone's bank accounts or preventing a company from making transactions in a foreign currency. At a time of shifting global power balances, when human-centred solutions are by no means a given and authoritarian practices are on the rise, the consequences of these changes need to be on the radar of policymakers in a variety of domains.

In order to reap the benefits and mitigate the risks that accompany the rise of disruptive fintechs, the EU and its member states need to act. Economic competitiveness and innovation, financial-economic and social stability, and inclusion and equality are at stake.

Actionable steps for European regulators

- **Acknowledge the shift towards DeFi and act on this with a multi-stakeholder approach.** Bringing together the global open-source and crypto-communities, engineers and developers, European start-ups and companies and national regulators, can help in reaping the opportunities of DeFi and mitigating its challenges. If the objective is for the EU to remain a strong player in the financial sector, now is the time to invest not only in fintech and in regulation of the digital financial industry, but also to acknowledge that DeFi is emerging as a potential new paradigm.

- **Discuss the potential geopolitical implications of digital financial technologies and DeFi** with technology experts and consider the risks to financial and social stability. Through mutual understanding, sharing of best practices and discussions on digital freedom, (regulatory) responses can be improved. Act on the understanding that the DeFi space shares many of the values and principles that are reflected in the EU's human-centric approach and its digital single market strategy, including data sovereignty, open innovation, interoperability and multilateralism.
- Benefiting from a first-mover advantage in DeFi, **strengthen Europe's economic competitiveness and innovation** in the long run. DeFi has the potential to be an important economic opportunity, as it provides a decentralized, soft infrastructure that enables data-sharing and data ownership. In combination with open-source development, DeFi could provide an important future opportunity for incubating a European innovation ecosystem.
- **Address the regulatory and security risks of DeFi** – and the trend of decentralization in general. These risks include anonymity to cover criminal activities and the difficulty of enforcing top-down regulation when needed.
- **Continue and accelerate investments in self-sovereign digital identity management and data portability.** Promote these as important instruments to help citizens implement their rights, characteristic of the EU's human-centred approach in the financial sector.
- **Elevate citizens' knowledge and digital skills** to withstand pressure from Big Tech fintech players. This will enhance online resilience and supports social stability as well as inclusion and equality in the digital domain. Big Tech's entry into the European digital financial services market may be appealing to consumers, in the sense that it allows consumers to connect their finances to the ecosystems that they already use, for example of Apple, Amazon or Alibaba. However, greater awareness is needed by consumers about the aggregation of their data by Big Tech and third parties, including their financial data.
- **Track consumer adoption of fintech services**, as users might gain access to easy-to-use financial products and services, while lacking the financial literacy to make prudent decisions.
- **Educate policymakers on the technological potential of DeFi** so that they can better comprehend the new DeFi paradigm, and can contribute to it while mitigating its challenges. This education can build on initiatives such as the DeFi Education Fund, which seeks to achieve regulatory clarity for the DeFi ecosystem and provide education on the DeFi ecosystem.
- **Enhance awareness of the potential of DeFi technology to contribute to innovations in regulation**, as it allows compliance and enforcement to be executed more efficiently and in real-time by smart contracts and machine executable regulation. As such, decentralization is not only a disruption of finance, but also a disruption of regulation

Governments throughout the world are struggling to deal with the challenges that accompany the disruptive transition of digital finance, even if in vastly different contexts.³¹ While Europe has developed a strong traditional financial sector in recent decades, countries in the Indo-Pacific – especially India, Singapore and Indonesia – have leapfrogged to fintech, often provided by Big Tech. Here, digital financial services offer great opportunities for development, as an instrument to reach large numbers of unbanked people easily and to transfer remittances.

As countries in Europe and beyond seek to harness the vast economic, political and societal opportunities of digital finance, they need to be aware of the strong geopolitical undercurrents. In the end, digital resilience depends on proper data governance, digitally skilled citizens and a competitive industry that promotes European human-centred standards from the bottom-up – at home and in global markets.

31 This is detailed in a forthcoming Clingendael Policy Brief on EU-ASEAN digital connectivity (February 2022).