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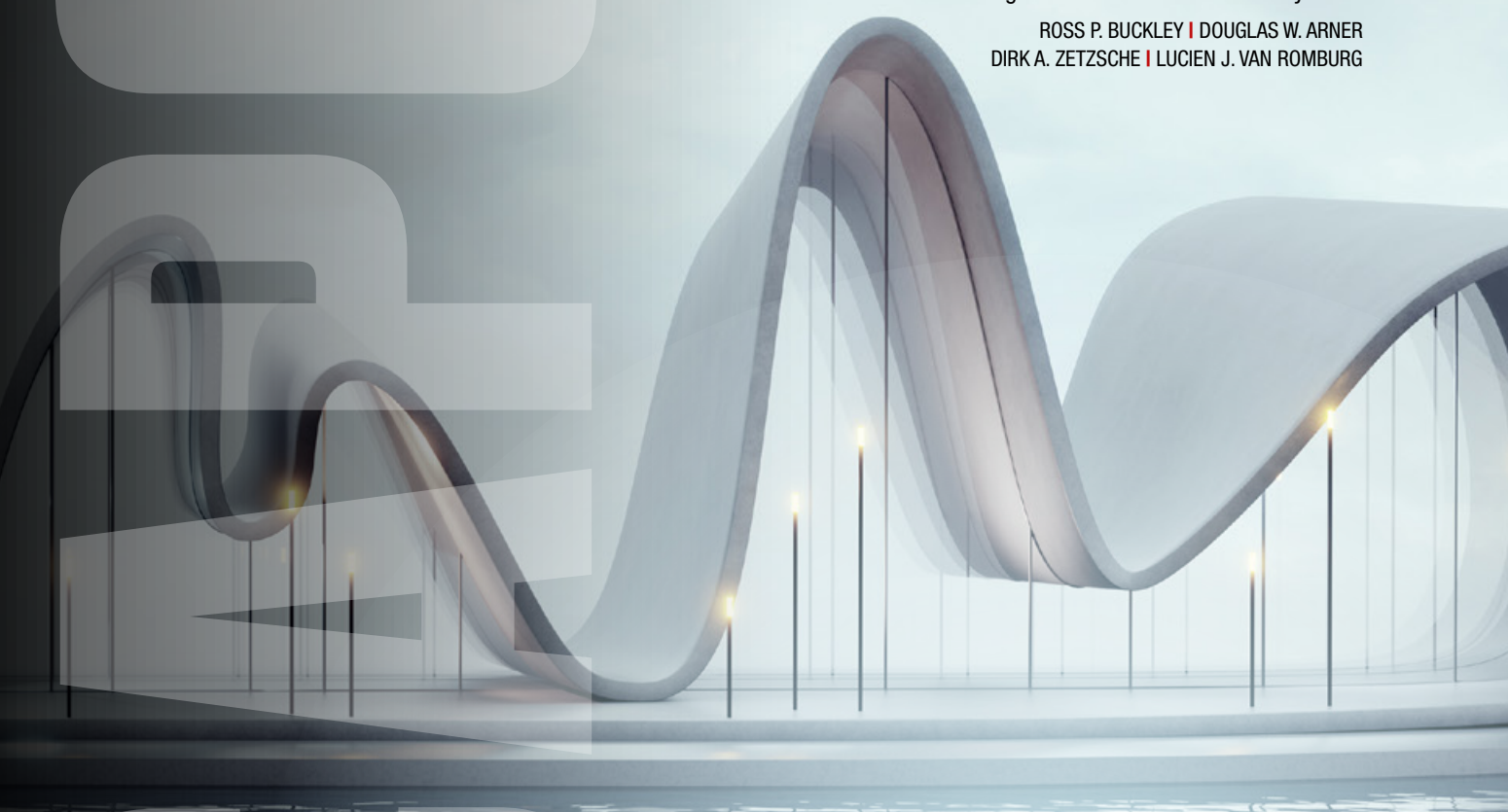
GOVERNANCE OF TECHNOLOGY

Building FinTech and innovation ecosystems

ROSS P. BUCKLEY | DOUGLAS W. ARNER
DIRK A. ZETZSCHE | LUCIEN J. VAN ROMBURG



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DEAR READER,

In my new role as CEO of Capco, I am very pleased to welcome you to the latest edition of the Capco Journal, titled **Balancing Innovation and Control**.

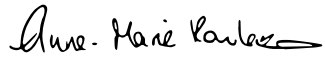
The financial services and energy sectors are poised for another transformative year. At Capco, we recognize that this is a new era where innovation, expertise, adaptability, and speed of execution will be valued as never before.

Success will be determined based on exceptional strategic thinking, and the ability to leverage innovative new technology, including GenAI, while balancing a laser focus on risk and resilience. Leaders across the financial services and energy industries recognize the transformative benefits of strong governance while needing to find the optimal balance between innovation and control.

This edition of the Capco Journal thus examines the critical role of balancing innovation and control in technology, with a particular focus on data, AI, and sustainability, with wider corporate governance considerations. As always, our authors include leading academics, senior financial services executives, and Capco's own subject matter experts.

I hope that you will find the articles in this edition truly thought provoking, and that our contributors' insights prove valuable, as you consider your institution's future approach to managing innovation in a controlled environment.

My thanks and appreciation to our contributors and our readers.



Annie Rowland, **Capco CEO**

BUILDING FINTECH AND INNOVATION ECOSYSTEMS

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ABSTRACT

In our new book, FinTech: finance, technology, and regulation [Buckley et al. (2024)], based on analysis of experiences with the integration of new technologies into finance and of digital financial transformation around with world, we present strategies for policymakers and regulators seeking to build FinTech and innovation ecosystems, to support digital financial transformation and inclusive, resilient, and sustainable digital finance. This strategy comprises three levels. First, we focus on the central role of digital public infrastructure and digital financial infrastructure, based on a four-pillar strategy, which includes: (i) digital ID and e-KYC systems; (ii) open, interoperable electronic payment systems; (iii) electronic government provision of services; and (iv) enabling new activities, business, and wider development. Second, we set out seven elements that encompass appropriate regulatory approaches to support digital finance. Finally, we highlight the role of the wider ecosystem, focusing in particular on data strategies and support for research and innovation. This strategy is central to balancing the risks and opportunities of digital finance, FinTech, and innovation to contribute meaningfully to the advancement of inclusive sustainable development.

1. INTRODUCTION

In the next decade, global finance will be significantly impacted by the rapid advancement of technology, the need for sustainable development, and the perennial friction between economic, financial, and technological fragmentation and globalization. While these developments may introduce novel opportunities, they may also present challenges for the financial system.[2] Digital finance, if correctly designed and regulated, can be applied to ameliorate the effects of future crises and can advance inclusive sustainable development. Regulators, who form an integral part of the interactive system that financial technology (FinTech) encompasses, are required to implement strategies to ensure that the financial system is fit for the future.

On this basis, this article seeks to analyze which strategies regulators are required to implement to ensure that the financial system is fit-for-purpose going forward. These strategies have been formulated based on a synthesis of core lessons drawn from the past decades, and focus on building the necessary digital infrastructure and developing new regulatory approaches.

2. DIGITAL FINANCIAL INFRASTRUCTURE

Digital financial infrastructure is central to advancing the aims of finance, from financial inclusion to financial stability, resilience, and sustainability. The experiences drawn from various crises have reinforced the significant role of digital

[1] We would like to thank the ARC Laureate Fellowship Scheme, the Hong Kong RGC Senior Research Fellow Scheme, and the ADA Chair in Financial Law (inclusive finance) for financial support.
[2] Buckley et al. (2024) sets out the factors that will impact this outcome.

infrastructure as being fundamental for crisis management, economic recovery, and sustainable development. In our view, countries need to direct their focus to four pillars of digital financial infrastructure (set out below), which are essential to supporting digital financial transformation [Arner et al. (2021)]. The adoption of such a strategy may realize the full potential of FinTech on the basis of a progressive approach to the development of the underlying infrastructure for digital financial transformation.

2.1 Pillar I: Digital ID and e-KYC systems – establishing the foundation

Mobile payments and the required foundational layer of digital identity (digital ID), specifically sovereign digital ID, are central to the digital transformation process, and constitute the required foundation for all subsequent components of a digital financial ecosystem. Several digital ID systems have been developed, particularly to assist less advanced economies, where people lack formal identification documents. IrisGuard, for example, is a digital ID solution composed of iris recognition technology that converts an iris image into a unique code, which is subsequently used to identify an individual. IrisGuard has developed digital ID solutions for the U.N. and Jordan that focus on digital ID solutions for refugees.[3]

IrisGuard's digital ID solutions provide the necessary digital ID to enable beneficiaries to receive food vouchers, withdraw cash, and to transfer funds without the need for a bank account. To this end, it provides what we refer to as the "base ID infrastructure", which establishes a link between the physical individual and the specific digital service. While IrisGuard's digital ID solutions make use of human physical attributes, base ID can also be developed from several sources, which include business-specific electronic identities, such as customer accounts with e-commerce platforms. India's Aadhaar system is another example of base ID, which entails the issuance of a 12-digit randomized number to all Indian residents and facilitates access to financial accounts and digitizes government payments and services.[4]

Base ID, therefore, provides a fundamental element necessary for the "know your customer" (KYC) process. The central aim is to enable bank account opening for the majority of people and entities in a simple and cheap manner. This permits resources to be redirected towards the protection of market integrity and for analyzing the position of high-risk customers. The technology thus enables the interlinkage of various systems, which assists with balancing economic growth, financial inclusion, and market integrity while complying with international financial standards. In Europe, for example, the eIDAS system interlinks the ID systems of the 27 E.U. member states and bank account opening without physical attendance.[5]

Digital ID systems can also be used to store customer financial criteria to enable financial institutions to identify customers' needs and preferences from a stronger starting point. Electronic identification is, therefore, required as the foundation from which financial institutions comply with customer due diligence standards, thus enabling a wider array of financial services. It should be noted, however, that while technically possible, the interconnection of digital ID systems may not always be politically feasible. Cybersecurity and data protection challenges may also thwart the unwavering support for mandatory, all-encompassing digital ID systems for all members of society.

2.2 Pillar II: Open, interoperable electronic payment systems – building connectivity

Access to payments must be ensured once a digital ID system has been developed. Payment systems establish the fundamental infrastructure through which money flows in any economy. One way in which FinTech can assist is through advancing a mobile money (e-money) ecosystem. In general, e-money is defined as a stored value instrument or product that: (i) is issued on receipt of funds; (ii) consists of electronically recorded value stored on a device such as a mobile phone; (iii) may be accepted as a means of payment by parties other than the issuer; and (iv) is convertible back into cash [Binda (2020)]. Mobile money enables the payment of bills, remittance of funds, and deposit of cash through the use of a mobile phone.

Interoperability is key to the impact of digital payments, which governments are mandating increasingly to expand economic and social benefits and innovation. Crucially, digital payments are made attractive through the use of interoperability to bring together traditional and new forms of payment. In China, for example, Alipay and WeChat have illustrated the power of the facilitation of new entrants and the digitization of traditional payment systems. By 2021, 64% of the Chinese population made use of mobile payments, with Alipay and WeChat

[3] https://tinyurl.com/2xzwf25v
[4] "About Aadhaar", Unique Identification Authority of India, https://tinyurl.com/w55j5ypz
[5] "eIDAS: The Digital Identification Regulation for Europe," ElectronicID, https://tinyurl.com/2ry3e9je

constituting 91% of all digital payments effected [Schirmer (2022)]. Overall, governments are increasingly mandating interoperability as a licensing condition for payment providers.

2.3 Pillar III: Electronic government provision of services – expanding usage

The use of open electronic payments infrastructure by governments, as provided for in Pillars I and II above, is integral to the process of digital transformation, and can be effected through state support payments made through digital government-to-person (G2P) payments. These digital payments support governments in their shift from in-kind assistance (i.e., supply of food and water) to more affordable cash transfers. Further, accounts used for G2P support payments may also be used for non-government payments purposes. They also support financial education initiatives by enabling people to learn how to use digital payments through the relevant digital platform. G2P payments can, therefore, be used to further financial inclusion and sustainable development.

G2P payments have been used by several governments with the aim of bringing the financially excluded into the formal financial system and to enhance the efficiency and effectiveness of government payments, services, and transfers. During the COVID-19 pandemic, the use of such payments increased significantly, with 60 low- and middle-income countries making use of digital assets or payments to deliver social assistance programs [World Bank (2021)]. In Tunisia, the first round of emergency COVID-19 payments was delivered via the post. However, during the second round of payments, users were able to register for their payments digitally, in addition to selecting their preferred digital payment method.

G2P payment systems should, however, be properly designed to facilitate the achievement of the aforementioned objectives. In general, well-designed G2P payments comprise three fundamental characteristics. First, account procedures should later facilitate unrestricted payments. Second, the digital-to-real gap should be bridged as individuals will prefer cash where digital transaction partners are limited. If merchants are unable to conduct their business without the acceptance of e-money, experience illustrates that they will provide devices that accept e-money efficiently, with or without incentives. Finally, functionality should be simple and must enable learning for making and receiving transfers.

Governments can advance digital transformation by highlighting the advantages of using e-money, by requiring merchants to accept digital payments at low or no cost to customers, and through setting limits for cash transactions in the real economy. Overall, G2P payments may be used to facilitate improved tax collection, as small and medium enterprises advance within the formal financial system, in place of developing outside of it. It may also provide support for the development of national pension systems over time, which enhances the available financial safety net and the provision of additional financial resources to drive growth.

2.4 Pillar IV: Enabling new activities, business, and wider development

The digital infrastructure created in Pillars I – III can be built upon to create innovative forms of financial services that enable new activities and business, and broader development. For example, in place of the traditional provision of credit through credit risk analysis conducted by specialized banks on the basis of collateral, digitization has allowed for the pricing of credit through datafication (i.e., the process of using and analyzing data). More accurate data may, therefore, be gathered from e-commerce platforms, search engines, social media services, and telcos [Zetzsche et al. (2018)]. The big data approach of TechFins[6] potentially enhances business decisions through the provision of a better picture of customers' financial positions using the more accurate datasets.

TechFins can, therefore, play a central role in re-personalizing the financial relationship with their customers through adjusting credit rates on the basis of the real risk profiles of individuals. Further, transaction costs per customer are significantly lowered on the basis of the economies of scale inherent to the tech platforms used by TechFins. As a result, the provision of "personalized" services at a reduced cost per customer supports the delivery of financial services for small amounts of money, which also advances financial inclusion. However, in spite of the potential significant benefits, the introduction of TechFins also creates novel challenges at the intersection of data and financial regulation.

The increased access to, and reduction of transactions costs for financial services provided by digitalization also advances the expansion of the level, range, and quality of insurance and investment services, and supports the progression of technologies such as artificial intelligence (AI).[7] This expansion

[6] TechFins have been described as established technological and e-commerce firms who provide financial services [Zetzsche et al. (2018)].
[7] See Part II of Buckley et al. (2023)

and progression may possibly bring new financial services into the financial system that may correspondingly advance business development, infrastructure, and innovation, through increased savings rates, which may be redirected through the financial system.

3. NEW FINANCIAL REGULATORY APPROACHES

Digital infrastructure requires appropriate legal and regulatory frameworks that support the creation of inclusive, resilient, and sustainable digital finance. To ensure that the financial system is able to contribute to the achievement of these objectives, digitalization must be paired with fit-for-purpose regulation. In our view, governments and regulators alike should direct their attention to the implementation of new financial regulatory approaches that can act to support the achievement of the aforementioned objectives. We set out below these new regulatory approaches in seven principal elements.

First, a broader analytical framework is required to address the risks associated with innovation, including: (i) new sources of traditional risk, (ii) new forms of risk, and (iii) new markets and systems. The application of such a framework requires a careful consideration of the principal areas of concern that have emerged during the process of digital financial transformation. These areas of concern include cybersecurity, data security, and data privacy, and the appearance of new systemically important data-driven financial institutions, such as novel forms of market infrastructure.

Second, regulators should expand their expertise to continuously deepen their understanding of the interlinkages between the real economy and finance, which is growing ever more complex. Multidisciplinary insights are required, spanning the social sciences, and the formal natural sciences, to reassess and account for different risk exposures and to evaluate its impact on sustainability and the recovery of each regulation. Practically, this means that regulators must recruit more staff with analytical, interdisciplinary, and scientific skills, with expertise in, for example, the subject of systems science, to properly understand how climate change is likely to impact various environmental risks.

Third, regulators should promote innovation through the adoption of balanced proportional risk-based regulation. To ensure that the financial system is fit-for-purpose, they should assess and modernize ill-suited regulation as identified through regulatory impact assessments. Such assessments will assist in determining whether legacy rules remain helpful in the modern era of financial regulation. In parallel thereto, regulators should also put into place effective regulatory facilitation arrangements, such as innovation hubs and regulatory sandboxes, which promote innovation and mutual learning through extensive interaction between themselves and various market participants [Buckley et al. (2024)].

> *"Regulators will be required to make increasing use of technology to effectively regulate finance."*

Fourth, regulators will be required to make increasing use of technology to effectively regulate finance and they should be greatly aided by higher levels of datafication. To this end, they should upgrade their supervisory data systems and regulatory technologies (SupTech and RegTech) and work towards supporting the developing of core digital infrastructure. The focused roll-out of SupTech and RegTech will support apt proportional regulation of innovative financial products and services, including those underlined by principles of sustainability, which will have the net effect of benefiting financial inclusion and will address risks associated therewith.

Fifth, regulators and regulated entities will likely need to adopt a "beta approach" to regulation, which is common to software development. Regulation will never be without fault and the use of finance to mitigate the effects of external shocks will require a continuous adjustment to the relevant rules and standards. As such, financial regulation will be informed by a process of trial and error, in which regulators learn from experience and adjust on the run, an approach that may likely be abhorred by many traditional regulators. This will likely require a combination of hard and soft law, in addition to binding and indicative forms of regulation.

Sixth, the efficacy of financial regulation and sustainable development can be further progressed through regional regulatory approaches that support the needed scale. To this end, regulators and policymakers in many countries

will be required to support regionally harmonized regulatory frameworks. Consistent regulatory approaches across a specific region will advance national markets' interests in innovative financial service providers. At the same time, the increased concentration of providers in a region will provide consumers with a wider range of services to choose from, while benefiting from more competitive prices. It would also increase the possibility of providers creating innovative solutions to a broader range of issues.

Finally, regulators will be required to consider the broader societal ecosystem in which FinTech operates to advance inclusion, innovation, resilience, and sustainable development on the basis of a much-widened regulatory mandate. In the context of digital finance, the broader ecosystem focuses on education, funding, and skills, in addition to the development of expertise on the basis of related professional and other associations. In many countries, greater focus has been directed towards advancing education in the STEM disciplines and in social science research into the effect of technology on humankind.

A focused implementation of these new financial regulatory approaches should likely encourage and facilitate the advancement of innovative financial products and services, while at the same time attending to the corresponding risks. They form an overarching strategy that supports FinTech, financial inclusion, innovation, and sustainable development, and can be further progressed through a requisite focus on building digital infrastructure and on regional regulatory approaches that support the required scale.

4. THE WIDER ECOSYSTEM: DATA, RESEARCH AND INNOVATION SUPPORT

The third level of the strategy involves the wider ecosystem. From the standpoint of the wider ecosystem, three elements are particularly important: an enabling legal system, strategies to maximize the benefits of data, and approaches to support research, development, and innovation.

From the standpoint of the legal system, it is important – in addition to regulatory approaches at the second level and infrastructure at the first – to consider the role of private law in providing appropriate support. This relates directly to the need for strategies to maximize the benefits of aggregate data while minimizing the risks of concentration and dominance, which result from combinations of network effects of technology and economies of scope and scale of finance. These include both clear legal approaches to data as well as frameworks to support sharing and use, particularly mandatory open finance. Finally, these are enabled by support for innovation through mechanisms such as innovation hubs and research and development funding. Together, this combination of an enabling legal system, including for data, along with strategies for maximizing the benefits of data along with support for innovation, research, and development, provides the wider context to support digital financial transformation and inclusive sustainable development.

5. CONCLUSION

The central aim of this paper was to set out strategies to be implemented by regulators for building digital financial infrastructure that supports digital financial transformation. At the same time, it aimed to set out new financial regulatory approaches that can be adopted to support inclusive, resilient, and sustainable digital finance. To ensure that the financial system is capable of contributing towards the achievement of these roles and objectives, digitalization is required to be paired with fit-for-purpose financial regulation.

These lessons can support governments and regulators in ensuring that digital finance is appropriately enabled, supported, and regulated in order to mitigate the effects of future crises and best contribute to the advancement of inclusive sustainable finance.

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