ONLINE RESOURCES

FINANCIAL TECHNOLOGY

CASE STUDIES IN FINTECH INNOVATION

NIELS PEDERSEN

KoganPage

PRAISE FOR *FINANCIAL TECHNOLOGY*

If there's one book you need to read on fintech, this is it! *Financial Technology* is a must-read for anyone who wants a deep insight into this exciting industry.
Angela Yore, Co-Founder, SkyParlour

Financial Technology is a relevant, fresh and enlightening read for both seasoned finance veterans and those new to finance and fintech innovation. Niels Pedersen's case studies are largely drawn from the US and the UK, but his takeaways and insights are equally applicable to South East Asia or in a global setting.
Erik Jonsson, Head of Digital Partnerships, Techcombank

Niels Pedersen accurately captures the key elements that contribute to innovation in the financial technology ecosystem, making this publication relevant to anyone who has an interest in the sector.
James Nurse, Managing Director, FINTRAIL

Whether you are an established brand or a new innovator, fintech holds the key to driving digital and financial inclusivity. *Financial Technology* summarizes the great and the good in the world of fintech, with case study material to help new entrants learn about best practice, as well as, most critically, taking a hard look at fintech business models so the next generation of fintech leaders can avoid the common pitfalls.
Neil Harris, Chairperson, The Inclusion Foundation

THIS PAGE IS INTENTIONALLY LEFT BLANK

Financial Technology

Case studies in fintech innovation

Niels Pedersen

KoganPage

First published in Great Britain and the United States in 2021 by Kogan Page Limited

2nd Floor, 45 Gee Street
London
EC1V 3RS
United Kingdom

122 W 27th St, 10th Floor
New York, NY 10001
USA

4737/23 Ansari Road
Daryaganj
New Delhi 110002
India

www.koganpage.com

Kogan Page books are printed on paper from sustainable forests.

ISBNs

Hardback 978 1 78966 545 1
Paperback 978 1 78966 543 7
Ebook 978 1 78966 544 4

British Library Cataloguing-in-Publication Data

A CIP record for this book is available from the British Library.

Library of Congress Cataloging-in-Publication Data

Names: Pedersen, Niels (Chartered accountant), author.
Title: Financial technology: case studies in fintech innovation / Niels Pedersen.
Description: London, United Kingdom ; New York, NY: Kogan Page, 2021. | Includes bibliographical references and index.
Identifiers: LCCN 2020042410 (print) | LCCN 2020042411 (ebook) | ISBN 9781789665451 (hardback) | ISBN 9781789665437 (paperback) | ISBN 9781789665444 (ebook)
Subjects: LCSH: Finance–Technological innovations–Case studies. | Financial services industry–Technological innovations–Case studies.
Classification: LCC HG173 .P43 2021 (print) | LCC HG173 (ebook) | DDC 332.10285–dc23
LC record available at https://lccn.loc.gov/2020042410
LC ebook record available at https://lccn.loc.gov/2020042411

Typeset by Integra Software Services, Pondicherry
Print production managed by Jellyfish
Printed and bound by CPI Group (UK) Ltd, Croydon CR0 4YY

To Sophie, for her unwavering
support, and love

THIS PAGE IS INTENTIONALLY LEFT BLANK

CONTENTS

LIST OF FIGURES AND TABLES

FIGURES

TABLES

ABOUT THE AUTHOR

Niels Pedersen is a senior lecturer on the MSc Financial Technology programme at Manchester Metropolitan University, UK, and a regular speaker on fintech. As a Chartered Accountant (ICAEW), he worked at PwC and the Financial Services Authority before coming to academia.

FOREWORD

The traditional global banking and finance system was once viewed as the backbone of trade and industry. Such governed and centralized financial systems are based upon government-issued (fiat) currencies, where key agents in the system are agreed on the value of cash via stock and local exchanges fuelling transactions and controlling economies. The physical nature of exchange between key agents and brokers excluded the masses from direct participation. Instead, the retail banking segment employed financial managers and experts to offer a portfolio of services to customers in return for interest payments on, for instance, loans and mortgages, etc – a distinct profit motive for the system. Over the centuries, this system monopolized the marketplace, presiding over consumer choic, underpinned by what could be described as a social contract of trust developed between the bank manager and consumer. This signifed a mutually productive relationship, packaged as safeguarding customers' financial interests and personal data (hardcopy ledger) while making a profit.

Before the global financial crisis of 2007–09 (GFC), discussions of the incumbent banks' dominant position and breaking of consumer trust would have been scorned for the lack of understanding surrounding the unique and socially embedded manager–consumer relationship. Since the GFC, we have seen a chain of events that gradually unpacked the macro-level centralized (and privileged) position of established financial institutions, revealing dubious trading practices with some reported reliance on underdeveloped algorithms making spurious transactions. In other words, failing to heed Ada Lovelace's warning: it [the algorithm] can only do whatever we know how to order it to perform. Enter the corporate rationalizers, introducing new technological innovations that challenge the extant system and its foundations, indeed, coining the term 'challenger' banks. Such innovation began to upset the equilibrium of the financial system, opening a pathway to a new decentralized form of exchange that shifts from physical to digital exchange, declaring the rise of the now-familiar financial technology (fintech) sector.

Today, we live in the 'digital economy', of which fintech plays a significant role in presenting substantial socio-technological and transformational chal-

lenges from new terminology and skills emerging from computer/data science. This is driving a mounting degree of technological development in enabling consumers greater choice in their financial decisions. The COVID-19 pandemic has reportedly driven acceleration toward a rethinking of our physical transactions with cash, finance and banking to full digitization or a cashless society. Thus, the once-revered discussion with the bank manager has been usurped by a digital 'bot' or assistant who can deftly answer those mundane questions about our bank balances or our likelihood of being granted a loan, for example. This socio-technical shift shows a reconceptualization of our social and physical relationship with finance to accessing online platforms. The power over our financial well-being and systems is moving away from larger financial institutions to that of the individual – decentralizing financial control and promoting agility in choice. We have neo-banks, challenger banks and fintech start-ups disrupting the plethora of services that was once the sole proviso of the financial agents monopolizing access to banking and finance.

How are organizations responding to this transformation of financial services? Simply put, technological innovation and collaboration has arrived and is cited as key for retaining a competitive advantage. Those who choose not to collaborate and engage with this next industrial revolution risk inertia – lacking agility in mindset and structure to adapt which could lead to exiting the marketplace. This is exemplified in the gradual closure of physical bank branches. The truth facing incumbents in banking and finance is: adapt, collaborate or die. Although they still retain customer mass over the new challengers, change is afoot.

Moreover, innovation invokes a myriad of digital regulations – albeit some rules and governance are also undergoing digital transformation to maintain pace with fintech innovation to ensure consumers do not fall foul of malpractice – back to Lovelace's warning around technology adoption. Yet, moving to a decentralized system is complex: finding a pathway through networks, APIs and new banking platforms (ie Open Banking platforms), and payments regulation. Thus, recognizing that buying off-the-shelf tech solutions without taking people into your network, organization or society with you may cause the profit motive to become unmoored. This is encapsulated in the first example of decentralized finance via distributed ledger technology underpinning blockchain and cryptocurrencies emerging since the GFC from the mysterious Satoshi Nakamoto. The limitations of a centralized system were writ

large and the underpinning (almost 'hippy') central tenets focussed on changing the game of finance and decentralizing control over the system.

What has happened with decentralized finance since 2008 and what does this imply for organizations? As discussed, cultural and technical shifts of this magnitude necessitate time: as humans, we generally resist change that is forced rather than owned by us. Therefore, the current wave of innovation moves beyond disruption to signpost a new relationship with finance that will (eventually) benefit the masses. Admittedly, there's work to be done in this sphere, heralded by the Open Banking and finance movements.

Financial Technology provides an encyclopedic guide to the fintech arena. The use of topical examples helps garner an in-depth appreciation of fintech innovation while reducing fears of automation. The author embodies boundless thinking and agility tempered with caution over adoption, while celebrating technological innovation – which should not be stifled but balanced by safeguarding individuals' financial well-being. Thus, he addresses the need for financial inclusion across society, whereby ethical access and use of consumer data is central to creating trust in financial innovation, as consumers also adapt to the new digital financial landscape.

Pitched against this backdrop of an evolving digital economy witnessing unprecedented innovation, change and societal challenges, this book captures key aspects of the fluid fintech landscape while adding to the growing body of knowledge in this emergent field. Thus, the reader is offered methods to navigate through the minefield of decentralized financial innovation and seize aspects to embed within their organizations or facilitate further development across social and technological domains.

Dr Karen Elliott
Associate Professor of Enterprise and Innovation focussing on FinTech at Newcastle University Business School, UK, on the Standout 35 Women in FinTech Powerlist, and part of the IEEE committee for Ethics, Trust and AI in Society

PREFACE

Every few years, a new buzzword makes its way into the headlines. From 'AI' to 'Big Data', and 'Cryptocurrency' to 'DLT', these terms are used to capture public imagination with grand promises and great expectations. To the cynic, the excitement around new technologies may seem like repetitions of past hype-cycles; however, as digitization accelerates, and reimagines the way we work, one can no longer remain a luddite. Instead, there is a need for learning and adaptation. This is not a one-off; rather it is a lifelong process. The opportunities of tomorrow belong to the curious.

When looking into new technologies, anyone without a background in computer science will almost immediately face stumbling blocks in the form of jargon. When looking up a new term, it is not uncommon to find oneself confronted with more jargon; in other words, end up with more questions than answers. This is a frustrating feeling, which leads many to give up, perhaps while thinking that 'technology is not for me'. Furthermore, even when one does overcome the jargon to gain some understanding, there is the feeling of being lost at sea. After all, how does it all fit together?

This book is an attempt to address these problems. It seeks to do so by giving the reader a basic yet thorough understanding of how the most important technologies work, and crucially, contextualizing these in terms of their impact on the financial industry. In doing so, the author hopes to instil a greater confidence in the reader, to dig deeper and learn more about those technologies that capture their imagination.

At first glance, the topics covered herein may seem disparate. The different technologies that are explored may seem unconnected. However, when seen from a bird's-eye view, the relationships become clearer. In this way, this book attempts to give the reader a 'lay of the land' in order to understand how different technologies are subject to the same underlying trends. For example, the ascent of artificial intelligence (AI) and cryptocurrencies would not have been possible without the processing power enabled by advancements in microchip technology; in other words, both innovations are part of the same story.

A core theme in this book is that the financial system and the internet are converging. Just as financial transactions contain information about people's preferences, so do clicks, reposts and instant messages. As both categories rely on the transmission of electrical signals, it is difficult to demarcate the two systems; indeed, with the increasing monetization of online user behaviour and the growing digitization of finance, perhaps they will soon be indistinguishable?

When exploring fintech through the lens of systemic convergence, between the financial and digital spheres, it becomes clearer how the various topic areas of this book fit together. While greater connectivity and better user interface design enable greater data collection, technologies such as blockchain and AI enable the emergence of new, and better, ways of doing finance. The net result of this is that financial services become increasingly decentralized, automated and user centric.

However, it is hoped that the reader will see fintech as more than making financial services faster, cheaper and more convenient by way of digitization. There is a paradox in using technology to reduce or remove humans from financial services, in that this actually increases the need for a human touch; in the absence of person-to-person interactions, the only thing distinguishing one financial institution from another will be corporate logotypes. In other words, a competitive advantage can be found in deploying a human touch in a fintech context.

Thus, it is hoped that the reader will use this book to benefit professionally from the wave of technological disruption sweeping through the financial sector. Whilst some professionals are dabbling in coding and others are honing their 'soft' skills, there is an opportunity in being a conduit between the two camps; in other words, being the link between decision makers (clients, senior management, etc) and the 'techies'. This book is written with those professionals in mind and aims to give them the requisite knowledge to pull this off.

ACKNOWLEDGEMENTS

In no particular order, thanks to David Gardner of TLT Solicitors, Dr Karen Elliott of Newcastle University and Mark Roberts of the Chartered Banker Institute for their feedback on earlier drafts of this work. In addition, the author would like to extend his gratitude to Michal Gromek and Pablo Neporozhnev for their productive conversations and encouragement in support of this work.

WALKTHROUGH OF FEATURES AND ONLINE RESOURCES

Learning objectives

LEARNING OBJECTIVES

At the beginning of each chapter, a checklist of learning objectives outlines what you will learn from reading the chapter.

Case studies

CASE STUDY

A range of case studies about different products, services and organizations bring the theory to life and illustrate how key ideas operate in practice.

Discussion points and suggested answers

DISCUSSION POINT

An open question helps students probe further into the case study and stimulates discussion on topical issues.

SUGGESTED ANSWERS TO DISCUSSION POINTS

Suggested answers, included at the end of the each chapter, explore points you may have missed and encourage further reflection.

Key takeaways

KEY TAKEAWAYS

A clear summary of the most important lessons from each chapter, which allows you to reflect on what you have learned.

Glossary

A collection of technical terms and their definitions which helps cut through jargon and demystify key technologies in a clear and accessible manner.

Online resources

Supporting online resources for students and lecturers include supplementary case studies, which will provide more extensive examples, and PowerPoint lecture slides for each chapter of the book. The online resources can be found at koganpage.com/FinancialTechnology.

01

Networks, APIs and fintech banking platforms

How technology is decentralizing finance

LEARNING OBJECTIVES

This chapter will help you understand:

- How digitization is transforming finance.
- Why fintech start-ups are making inroads into banking.
- The possible business models that may emerge as a result.

Introduction

In many British cities, the word 'exchange' appears on old buildings and in place names: Royal Exchange, Exchange Square, Cotton Exchange, and so on. These remind us that, once upon a time, transacting face to face in financial markets was the norm: between 1870 and 1929, there were stock exchanges in a dozen cities across the UK.[1] However, over this period, the proportion of securities traded exclusively in London grew from *ca* 38 per cent to around 72 per cent.[2]

With the advances in technology and infrastructure seen during this time – in the form of the railway expansion, the telephone and radio communications – it is perhaps surprising that this centralization took place. Surely, the greater connectivity enabled by these innovations would have fostered greater decentralization in financial markets?

This conundrum may be explained by a phenomenon known as *the network effect:* as a network grows, it becomes more attractive to its participants, due to the advantages that its greater size affords them.[3] These advantages are known as *network externalities*,[4] or, perhaps more commonly, *network effects*.

Liquidity and low transaction costs are network externalities of large financial markets (see Chapter 6). At the start of the 20th century, London was the world's largest capital market.[5] As a result, many companies, especially those seeking international expansion, were drawn to the capital.[6] In this way, London's size and international connections gave it an edge over its provincial rivals, which led to a concentration of financial services in the capital.

Just as regional stock exchanges have disappeared, bank branches are closing down across the UK. In 2017 alone, British banks closed 762 branches.[7] At the time, this represented a reduction of *ca* 8 per cent in the number of branches. What's more, this trend does not appear to be letting up: in 2018, it was reported that UK banks were closing *ca* 60 branches a month.[8] What is happening?

The answer appears to lie in the increasing digitization of finance. Though the internet and financial system are two distinct networks, both rely on the transmission of electrical signals: fundamentally, the physics of sending an email and making a digital payment are very similar. As a result, the increasing number of web-connected devices with financial applications is digitizing financial services, thereby reducing the need for bank branches.

This trend is evident in the decline of cash payments. In 2015, it was estimated that 57 per cent of all consumer payments were made without cash (ie with card, mobile or online – in effect, *digitally*).[9] Moreover, digital payments are growing fast: between 2012 and 2016, they grew at an annual rate of *ca* 10 per cent.[10]

Consumers appear to be embracing digital finance. For example, 84 per cent of Australian millennials say that they would bank with one of the large technology companies (ie Google, Apple, etc), if such services became available.[11] Given the global reach of anglophone millennial culture, there is little reason to believe that this figure would be much different in a survey of US or UK millennials.

Such willingness on the part of consumers to engage with web-based financial solutions was not always a given. For example, insurance providers struggled to gain traction online in the late 1990s:[12] consumers were initially reluctant to engage with financial solutions without a physical user interface. This was because potential problems were seen as easier to resolve in person

than over the internet.[13] Moreover, there was the issue of brand recognition: on the internet, consumers were more disposed to trust established financial brands.[14] These factors made it more difficult for financial start-ups to break through. So, what changed?

For one, a larger portion of consumers are now *digital natives* – either they do not remember a time before the internet or were first exposed to it during their formative years. Digital natives make up a large portion of the millennial generation (usually defined as those born between 1980 and 2000). This generation was projected to become the largest living adult population in the United States by 2019,[15] and is therefore its largest consumer group. With a greater proportion of consumers being digital natives, it follows that more people are willing and able to engage with digitized financial solutions. That said, there may be a more profound reason for this: declining public faith in mainstream financial institutions.

Around the turn of the millennium, consumers were reluctant to trust purely web-based financial service providers because they did not have established brands.[16] However, as a result of the global financial crisis of 2007–09 (GFC), trust in mainstream financial institutions has been severely impaired.[17] Moreover, the behaviour of big banks since the GFC has done little to help: in the years 2012–16, the world's 20 leading banks incurred an estimated £264 billion in fines and other financial penalties in relation to various legal and regulatory transgressions.[18]

Thus, the tattered record of the mainstream financial institutions has lowered consumer expectations to such a degree that novel, and non-mainstream institutions, appear comparatively more reputable. At the very least, consumers are now more willing to give alternative financial providers the benefit of the doubt: by virtue of having been in business for comparatively less time, post-GFC financial start-ups have, on the whole, a comparatively limited history of disappointing consumers. Thus, strong, established brands are no longer significant barriers to entry in the financial industry. This, combined with a growing pool of consumers who are digital natives, is a boon for financial technology start-ups.

At this juncture, some nomenclature is called for. Generally speaking, the term *financial technology* (ie *fintech*) is used to describe the use of technology to enhance or deliver financial solutions;[19] in other words, leveraging technology to make finance cheaper, faster, more accessible and more convenient. Furthermore, some people take the term 'fintech' to mean financial technology start-up.

Fintech start-ups are shaking up the financial industry by harnessing the connectivity of the web. As the internet facilitates 'shopping around' for better products and services, this connectivity can be detrimental to customer loyalty:[20] in this way, fintechs are able to draw customers away from traditional financial institutions.

Moreover, many fintechs harness their customers' personal data to provide personalized financial services.[21] Unlike big banks – whose back-office processes tend to be paper-based and encumbered by legacy IT systems[22] – fintech start-ups have leaner behind-the-scenes operations, thanks to their smaller sizes and propensity to automate their activities as far as possible. As a result, their distribution costs tend to be lower than those of their branch-based competitors; after all, their user interfaces (ie their websites and smartphone apps) *are* their branches. In this way, the cost advantage of not having a physical branch network may allow fintechs to offer more competitive financial solutions.

However, such connectivity-spurred growth can also be a double-edged sword. On one hand, it allows fintech start-ups to poach customers from established players with the promise of more convenient and cheaper solutions; on the other, the digital nature of their propositions reduces switching costs for customers. As a result, businesses that engage customers with an exclusively digital proposition may struggle with customer retention: according to a study of digital user interfaces, solutions that contain a human element exhibit greater rates of customer retention than self-service solutions.[23]

In this way, humanizing customer interactions can be a way of building customer loyalty. This has not been lost on C. Hoare & Co., a family-run private bank dating back to 1672.[24] While Britain's largest banks scaled back their branch networks, C. Hoare & Co. announced the opening of an office in Cambridge in 2019, its first outside London.[25] Granted, it is a private bank that caters to an up-market clientele. Customers like these appreciate a high level of service and are therefore willing to pay for it. That said, when a bank that has been around for nearly 350 years bucks the industry trend to open a new branch, it says something about the importance of relationships in business.

Harnessing relationships

In some way, a business model can be viewed as a cluster of relationships, whereby the success of a company depends on how well it manages each relationship. To gain a competitive advantage, the company must leverage its

distinctive capabilities (ie what it does well) in its relationships with customers, suppliers and other stakeholders.[26]

To stay ahead, companies must continuously seek to strengthen these relationships. To this end, reputation is paramount as it helps a company cultivate a sustainable competitive advantage.[27] The resources needed to compete (staff, technology, etc) can be readily acquired by competitors, but a sound reputation takes time to build;[28] by discouraging would-be competitors, a solid reputation can thus function as a barrier to entry.

To build and maintain a sound reputation, a business must, fundamentally, interact with its customers in a way that provides them with positive experiences. Given that millennial consumers are experience-orientated,[29] doing so consistently will help it establish a positive brand identity. In this regard, a company facing the end-user tends to be in the strongest position, as this allows its brand to occupy pole position in customers' minds. Retail banks have long held this advantage in that their branch networks allowed them to 'own' the customer relationship; however, this dominance is threatened by fintech innovation.[30]

Moreover, fintech is disrupting multiple sub-sectors: payments, consumer lending, wealth management, securities and insurance.[31] Of these, the payments sector is one of the more dynamic in terms of innovation and adoption of new technologies.[32] Given that payments form an integral part of the consumer experience,[33] this is perhaps no accident: this is an attractive sector because facilitating payments establishes a customer relationship, thereby laying the foundations for a brand identity. Down the line, this can be leveraged to generate additional revenue by providing additional financial solutions.[34] Investors in fintech understand this: between 2012 and 2017, start-ups in the payments sector attracted funding of more than US$21 billion.[35]

Thus, fintech start-ups are challenging established financial institutions by going after their most valuable assets: their customer relationships. This puts an onus on banks to upgrade their digital propositions. In the past, internet and telephone banking were seen as add-ons to branch networks; today, bank branches are becoming sub-components of greater digital networks.

Open Banking

Traditionally, large branch networks functioned as a barrier to entry in the banking industry. The name recognition afforded by these networks gave the advantage to incumbent banks.[36] Over time, the industry became increasingly

oligopolistic, particularly in the UK, where five large banking groups came to dominate the sector: in 2018, it was reported that, between them, these banks controlled around 80 per cent of the UK's retail banking market.[37]

However, digital banking channels have removed the need to attend branches to withdraw funds.[38] As a result, customers can switch providers without the inconvenience of visiting a branch. In this way, digitization has allowed fintechs to pry customers away from long-established financial institutions.

However, incumbent banks still had a significant advantage in the form of large databases of customer transactions. Such data assets can be a source of competitive advantage as they can be used to inform product development, cross-selling decisions and credit risk management.[39]

This did not escape the attention of regulators in the European Union (including the UK). As a result, the EU's Second Payment Services Directive (PSD2) came into being, which became part of UK law in 2018.[40] PSD2 is also known as *Open Banking* because it seeks to increase consumer choice in the banking system and make it more competitive.[41] Open Banking makes customer data portable, that is to say, it allows bank customers to share their transaction history with other financial institutions; of course, there are a few conditions: the third-party institution must have regulatory approval; customers must consent to sharing their data; and customers can withdraw their consent at any time.[42]

Furthermore, bank customers can grant these third parties the ability to initiate payments from their accounts.[43] This allows customers to transact via third-party applications; in a way, this is similar to shoppers linking their bank accounts to online payment processors. However, Open Banking goes one step further in that the third-party applications do not hold customer funds; instead, they make payments on behalf of their users by accessing their users' bank accounts.[44]

The technology behind Open Banking is known as Application Programming Interfaces (APIs – see box below). This allows fintech start-ups to access customer data stored within bank systems, thereby enabling the development of third-party financial applications.[45] In Britain, the Open Banking API is managed by Open Banking Limited – an entity created by the Competition and Markets Authority to support the implementation of Open Banking in the UK.[46]

APPLICATION PROGRAMMING INTERFACES (APIs)

An API is a software tool that enables different computer systems to communicate with one another.[47] Much like diplomatic protocol dictates how different heads of state communicate, an API provides a framework for the transfer of information between different computer systems.

A restaurant waiter is a good metaphor for an API. This is because they serve as a communication interface between customers and kitchen staff. The diners and chef do not communicate directly; rather, a waiter takes orders from the table and passes these to the kitchen. In response, the chef prepares food and sends this to the diners via the waiter. In this way, a waiter enables the two parties to communicate indirectly, much like an API serves as an information conduit between different computer systems.[48]

The waiter metaphor is particularly fitting because it describes a situation wherein the two communicating parties do not know each other; restaurant diners do not usually enter the kitchen. Similarly, a computer system supplying data via an API is agnostic in regard to its recipients.[49] This allows organizations to make data available to whosoever queries their API,[50] thereby giving the process a self-service aspect.

Much like a restaurant menu, an API is a framework for relations between sender and receiver. Like a restaurateur, the organization supplying the data gets to set the terms. The difference is that there is no such thing as going off menu. In this way, an API is effectively a contract that governs the interactions between sender and receiver.[51]

Besides facilitating data sharing between organizations, APIs can be used within organizations to transfer data between different systems.[52] Thus, APIs can also be used to address tethering issues between banks' legacy systems. Moreover, APIs allow different organizations to integrate their services more readily, thereby allowing start-ups to develop complementary services, as is the intention with Open Banking.[53]

For example, TransferWise, a foreign currency exchange platform, allows fintechs to plug in their users via its API (see case study in Chapter 2).[54] In this way, TransferWise benefits from having greater volume on its platform, while the tributary fintechs gain from being able to offer their users more holistic customer propositions.

Of course, organizations do not have to share their data for free. As APIs can facilitate fee-based data sharing, these tools provide an automated way for organizations to monetize their data assets. This could lead to an economy where organizations and consumers maximize the value of their data via APIs.[55]

API-based business models in financial services

Over time, the greater transparency and competition brought on by legislative changes and technological change are likely to change the financial industry significantly by transforming its constituent business models. What's

more, different institutions are likely to adapt to these changes in different ways: some banks may focus on originating financial products and distribute these via third-party intermediaries; meanwhile, others may opt to become these very intermediaries and focus on distributing third-party financial products via their user interfaces.[56]

The changes facing the banking sector have, to a greater degree, already occurred in the insurance sector. For instance, price comparison websites are used to distribute third-party insurance products.[57] In addition, some insurance providers routinely distribute products on behalf of third-party insurers while branding these as their own. This practice, called *white-labelling*,[58] is common in the insurance sector.

However, an origination strategy puts the originator's products at risk of commodification as it does not own the customer relationship:[59] as white-labelling does not expose the customer to the originator's brand, it forces the originator to compete on price. What's more, even when the product is originator-branded, the distributor can switch suppliers or use more than one supplier to begin with. In this way, product originators are often forced to compete on price. As a result, it is likely that banks pursuing a product origination strategy will want to brand their products as their own. In addition, these banks will likely supply a mix of own-brand and white-labelled products via a multitude of third-party channels, to avoid commodification and dependency on any one distributor.

A distribution-based strategy is the opposite of an origination-based one. This approach involves becoming a marketplace for financial services.[60] Taken to its extreme, this strategy would entail the bank having no products of its own, and instead serve as a data conduit between financial service providers and their customers.[61] Banks taking this road would need to engage customers with a compelling user experience – whether physical, digital or both – to avoid becoming just another price comparison website (for more on user interface/experience design see Chapter 3).

As the above-mentioned business models have inherent strengths and weaknesses, it is likely that some banks will pursue a mix of these, perhaps with an emphasis on one of the modalities; indeed, these strategies are not mutually exclusive.[62] In any case, it seems likely that larger banks will pursue a hybrid model as the scale and scope of their operations – and the glacial pace of change therein – make other paths difficult. Thus, large banks are on course to become platforms that provide customers with a holistic mix of in-house and third-party financial solutions; with the help of APIs, these

banks may start to resemble financial application stores:[63] this model is sometimes referred to as Banking as a Platform (BaaP).[64] We explore BaaP further in the case study on Starling Bank below.

The economics of platform banking

Banking platforms are at the centre of what economists call *two-sided markets*: these are markets where an intermediary (ie a platform) has two distinct 'customer' groups, wherein the intermediary's actions in regard to either group affects the other.[65] As a result, the platform must consider the needs of both sides as part of its business strategy.

Conventional retail banking is also an example of a two-sided market as banks have both depositors and borrowers. As part of its business strategy, the bank has to consider the rate it charges its borrowers (who want it to be low) and the rate it pays its depositors (who want it to be high). In this way, the interests of each customer group are in direct conflict. As a result, the bank's actions regarding either are interdependent.

That said, a retail bank is not a perfect example of a two-sided market as its customers can be both borrowers and depositors, which is often the case concurrently. As a result, the distinction between these two customer groups can be unclear. However, under the BaaP paradigm, this distinction is not the case: on one side of the market, there are the consumers; on the other, financial solution providers.[66]

The bank itself sits in the middle of the market, and, as the proprietor of the platform, must figure out how to monetize its position as intermediary. This starts with an understanding of what both groups want. While the digitally savvy consumers desire a suite of personalized and convenient financial solutions, the financial solution providers want access to the platform's user base. Thus, the platform's revenue model depends on both sides' willingness to pay for access to the other.

In large part, the bank platform's approach to monetization will depend on its competitive strategy. According to conventional theory, businesses generally compete in one of two ways: by being the cheapest or by being unique, which are referred to as *cost-leadership* and *differentiation*, respectively.[67] To maximize profitability, businesses can either charge low prices to attract a high volume of low-margin customers; or they compete on quality, enabling them to charge a premium on a lower volume of high-margin

customers.[68] In practice, many businesses have strategies that fall somewhere in between these two extremes.

In financial services, cost-based strategies can become a race to the bottom due to commodification. This is the case with online price comparison websites, where competition exerts downward pressure on prices.[69] As a result, many financial services firms instead pursue a differentiation-based strategy. What's more, some often seek to strengthen their proposition by homing in on specific segments. For instance, the Wesleyan Assurance Society, a Birmingham-based insurance provider, caters primarily to doctors, dentists, teachers and lawyers.[70] By focussing on these niche segments, Wesleyan is able to provide a specialized product offering, which allows it to charge a premium. This is referred to as a *differentiation focus* strategy.[71] Many banks already pursue some degree of specialization by focussing on certain product lines, customer segments or geographical regions. Therefore, it seems likely that these specializations will be transplanted onto banks' platforms to facilitate differentiation in their core markets; and, if nothing else, as a way of retaining customers.

To gain traction, platform businesses need to appeal to both sides of their markets.[72] On the one hand, a banking platform needs to curate a suite of financial solutions that is attractive to its customer base; on the other, it needs to offer financial solution providers a profitable user base. Thus, a higher quantity, and quality, of users should attract a greater number of financial solution providers, and vice versa. As a result, the more attractive a platform is to one side of its market, the more valuable it becomes to the other.[73]

Financial platforms often attempt to gain traction by offering generous terms to new users to attract solution providers. For example, Starling Bank does not charge its customers for making debit card payments or ATM withdrawals when abroad (see the case study below).[74] In this way, the bank incentivizes people to join its platform; once onboard, customers can be sold other, more profitable, solutions such as consumer loans or insurance. Thus, platforms can use loss-making solutions to draw in customers, thereby making themselves more attractive to third-party solution providers.[75]

Ultimately, the choice of revenue model depends on balancing the interests of users, solution providers and the platform itself. In this regard, the platform's competitive strategy becomes relevant, as cost-orientated users might be reluctant to pay for access; similarly, volume-driven solution providers will be unlikely to have significant margin to share with the platform. However, those pursuing a differentiation strategy may be able to charge a nominal fee for joining the platform, as a way of getting customers with

looser purse strings to self-select. To succeed in this, a bank would need to build a holistic suite of financial solutions perceived to be worth paying a premium for. Thus, the success of a platform's revenue model depends, to some degree, on matching up its users with financial solutions that are commensurate with their needs and budgetary constraints.

Regardless of its revenue model, a platform-based business is threatened by disloyalty on each side of its market: on one side, there is the risk that solution providers service users directly, thereby dis-intermediating the platform; on the other, providers may service multiple platforms, thereby making its proposition less unique.[76]

To address these problems, the platform must incentivize loyalty in its user base and solution providers. For users, this can be achieved by offering a unique user experience (see Chapter 3) and loyalty incentives: in the UK, for instance, some banks offer higher rates on savings for long-standing (and no doubt profitable) customers. Meanwhile, as the success of a platform rests on connecting users with solution providers,[77] the bank must at all times put itself between these two groups. In practice, this can be achieved by imposing restrictive terms on solution providers, to prevent off-platform transactions with its users. In addition, trust-enhancing features such as user reviews or dispute-resolution mechanisms can encourage users to stay on the platform;[78] conceivably, such tools are effective because they decrease uncertainty relative to transacting off-platform. Of course, by branding third-party solutions as their own, platforms can achieve a similar effect, while further entrenching themselves in the customer relationship.

At this juncture, it should be evident that there is no one-size-fits-all model for platform banking. As a result, hybrids may emerge, incorporating aspects of both cost-focussed and differentiated models. Indeed, variations of the same platform could be deployed in different market segments: a low-spec, low-cost solution for mass-market consumption and a premium solution for up-market customers. As banks already do this within their business and personal banking offerings, a multi-layered approach to BaaP appears likely.

Bank–fintech collaboration

Regardless of how banks monetize their offerings, digitally enabled financial platforms are likely to transform banking, and financial services more generally. Indeed, it is not hard to imagine a large insurer or asset manager

providing a BaaP-like solution: the key ingredients appear to be a large customer base and a willingness to engage with third-party solution providers, some of which are fintech start-ups. Perhaps then, large financial institutions will cease to focus on specific sub-sectors – such as banking, insurance or asset management – and leave the specialization to smaller players.

This progression can be described as the *un-bundling* of financial services: as part of this, fintech start-ups focus on providing specific solutions to compete against the most well-established players,[79] often in terms of convenience, customer engagement and/or cost; in turn, this draws customers away from incumbent financial institutions.[80] As a result, large financial institutions are forced to co-opt these fintech challengers, which, to some degree, re-bundles their innovative solutions via the incumbents' platforms.

Thus, the advent of BaaP-like solutions across the financial industry is likely to transform incumbent institutions into *one-stop shops* for financial services; where a solution cannot be offered in-house, it can be brought onboard via an external provider. As supplying the more innovative solutions that customers desire is, generally speaking, the domain of fintechs, established players find themselves drawn towards closer collaboration with the fintech sector.

Generally speaking, large financial institutions lack the agility and innovative culture of fintechs.[81] In addition, fintechs often start out by providing specialized solutions in niche markets,[82] which makes it hard to compete for generalist, mass-market financial institutions. Thus, to prevent fintechs from encroaching on their markets, banks must find ways of incorporating the most promising fintech solutions into their propositions.

Certainly, banks have much to offer fintech start-ups. For one, well-established financial institutions have large customer bases, and many fintech start-ups need access to these customers,[83] as even the most innovative financial solutions are worthless without users. In addition, large financial institutions have an abundance of capital, which many fintechs lack,[84] especially those that are not yet profitable, or indeed, without revenue.

Then there is the question of regulatory compliance. Large financial institutions have the requisite legal and regulatory expertise to navigate the complex environment of financial services regulation, something that many fintechs lack.[85] Although regulators have shown some forbearance (see Chapter 8) in regard to fintechs, these are not viable in the long term without access to regulatory expertise, especially as they scale up. Consequently, some start-ups may see partnering with an established financial institution as a way of gaining access to a well-resourced compliance department.

As incumbent institutions and fintechs have something to offer each other, it is unsurprising that banks are large investors in fintech start-ups. For example, by 2017, HSBC had invested US$200 million in fintech; its competitors, an array of global banks, are not far behind.[86] Investment can be seen as the most direct way of formalizing a relationship between a bank and a fintech provider. However, there are other, more informal, ways of building relationships with start-ups when their disruptive potential is not yet as clear.

Large financial institutions do this by sponsoring incubators: innovation centres wherein start-ups can experiment with, and build, novel technology solutions; these help established players identify and build relationships with promising start-ups.[87] By providing the necessary amenities and support, a sponsor may have first pick of novel fintech solutions relevant to its business model, thus effectively outsourcing innovation. Provided they can capitalize on the innovations nurtured within their incubators, this seems a much cheaper option than paying for management consultants or employing corporate innovation teams.

CASE STUDY

Starling Bank: A marketplace of financial solutions

While many fintechs seek to partner with large banks to gain access to their customers, Starling is disrupting financial services by building its own platform. Founded in 2014, Starling is a mobile-based bank, which can be accessed by downloading its app on IOS and Android-based devices.[88]

Starling's core product is a current account with features such as: no fees on cash withdrawals and spending abroad; bill-splitting tools which help customers share the cost of group expenditures (eg restaurant meals); in-app customer-to-customer transfers; and personal budgeting tools. Furthermore, the app is serviced by a 24/7 customer support centre.[89]

The Starling platform is hosted on Amazon Web Services (AWS). In this way, Amazon provides the behind-the-scenes infrastructure that supports the app. By using AWS, Starling has achieved the back-end scale of a large bank, which gives it the capacity to handle millions of customer transactions.[90]

Though Starling appears to be a 'mobile-first' bank, it is not exclusively digital. In 2018, the bank announced an agreement with Royal Mail, the UK's postal service, which allows Starling customers to deposit cash at its *ca* 11,500 branches.[91] Given that there are between 7,000 and 8,000 bank branches in the UK,[92] this move effectively gives Starling a branch network that is larger than all other retail banks combined. Furthermore, the public service ethos of Royal Mail – a vestige from the time it was state-owned – means that these branches are located in convenient locations across the country. Thus, it is likely that Starling customers never have to travel too far in order to deposit cash.

The cash-depositing feature is unlikely to be as important to retail customers as it is for business customers, especially smaller businesses, who tend to receive a large portion of their revenue in cash. Thus, the partnership with Royal Mail makes Starling attractive to cash-based business owners such as trades people, market traders and freelancers. Perhaps then, it is no accident that Starling also launched a small business account in 2018.[93]

This solution was initially only available to small businesses with one director (ie where the owner and sole director are the same person, and, very often, also the only employee). However, in 2019 Starling became the first mobile bank in the UK to offer accounts to businesses with multiple directors.[94] As part of this solution, Starling provides real-time data integration with accountancy software packages.[95] Evidently, Starling has been paying close attention to the needs of industry: according to a 2017 survey of 100 large businesses around the world, integration of banking data with organizational management systems was a key challenge facing corporate treasury departments.[96]

That Starling, a small, start-up bank with only a few years on its back, should seek to disrupt the commercial banking market by offering customers something they have long desired, reflects the bank's customer-centric ethos. Indeed, Starling was founded 'out of a desire to create a new kind of bank and to make banking more inclusive by putting customer needs first'.[97]

Clearly, Starling aims to do things differently. This is evident in its expansive ethics policy which, amongst other things, commits the bank to partnering with institutions 'who themselves are committed to operating under ethical and environmental standards equivalent to our own – including in the fair treatment of customers, employees and other stakeholders'.[98]

Starling's commitment to fairness and its customer-centric approach appears to be paying off. In 2019, it was named 'Best British Bank' in the British Bank Awards.[99] As this award was decided by a poll of than more than 27,000 customers,[100] it appears that Starling's approach is striking a chord with the public.

Part of Starling's success could be attributed to its marketplace model, which provides customers with a suite of carefully curated financial solutions from third-party providers. Indeed, the bank appears to be making the most of APIs to enhance the appeal of its platform: in 2018, founder and CEO Anne Boden noted that it was 'time to celebrate a new age of banking – the age of the API… a traditional paradigm has been recast and unbundled to reflect advances in technology, culture, demand and practice'.[101]

During 2019, Starling announced the introduction of an insurance provider, and a credit-rating improvement service to its platform.[102,103] These have complemented the borrowing and wealth-management solutions already on its platform, thus expanding the suite of innovative financial services. What's more, consumers appear to be taking note: by December 2017, the bank had more than 40,000 customers; a year later, this figure exceeded 350,000.[104] As a result, Starling's holistic approach to banking appears to be paying off. But what will happen once bigger players start to mimic this model at greater scale – can Starling stay ahead?

What are the strengths and weaknesses in Starling's business model?

(Suggested answer at the end of this chapter.)

Networked financial services

While a business can be viewed as a collection of relationships, it can also be analysed as a network. In this context, each business can be seen as a network of customers, employees and suppliers congregating on a shared platform. Thus, a business succeeds by strengthening the network effects associated with its platform.[105]

As a business grows, it becomes known to more people. In turn, this familiarity helps the business acquire new customers: as more users join, word of mouth enhances its reputation, thereby exerting pressure on people associated with existing customers to jump on the bandwagon[106] – if nothing else, just to fit in with their social circle. Human beings are influenced by the choices of their friends, colleagues and family members (see Chapter 3). This dynamic may partially explain the top-heavy concentration seen in the smartphone market, which is dominated by a handful of brands even though several dozen exist.[107]

Once a platform is sufficiently large and well established, its size attracts suppliers of complementary goods and services.[108] For example, many more third-party applications have been developed for the Windows Operating Systems than for Linux. This is because more people use Windows, which makes it more attractive to third-party developers. In turn, the greater availability of complementary solutions further strengthens the platform's appeal to potential users.

In the context of a financial platform, the network effect helps build and maintain a competitive advantage: as a platform grows its user base, consumer herd behaviour combines with supplier interest to increase the platform's appeal to potential participants – on both sides of the market. On one hand, consumers are drawn to the platform by the large number of people already on it as well as the availability of innovative financial solutions; on the other, fintech entrepreneurs are attracted to the platform by its large user base. This, in turn, enhances the product offering, thereby drawing in more users.

Despite the clear benefits that come with operating at scale, it would be fallacious to assume that every business should attempt to grow ad infinitum.

Every network will eventually suffer from growth pains; though network effects are generally positive, *negative network externalities* do exist.[109] In this way, network economics are similar to the concept of *economies of scale* from micro-economics: as a business grows it may benefit from advantages such as bulk purchasing discounts, easier access to finance and brand recognition. Thus, greater scale decreases the company's average cost per product made, thereby increasing its profit margins.[110] However, when a company becomes too large, its cost base can start to rise. For example, a large branch network is harder to manage than a single branch as upper management will find it more difficult to enforce frontline quality standards. This results in additional costs such as auditing expenses (ie a monitoring cost), resource waste and mis-aligned incentives. Such costs, known as *dis-economies of scale*,[111] are, to a degree, comparable to negative network externalities.

Platform businesses can be subject to negative network externalities and dis-economies of scale, as is evident in the problems facing large social media platforms in the form of abusive behaviour, privacy breaches and spam. As platforms grow, they become more attractive to bad actors on account of their greater size (ie a negative network effect). Thus, as data security and user privacy are paramount, the heightened risk of attack imposes additional costs on network-based businesses.[112]

In addition, such businesses may find that interventions designed to protect or enhance their platforms' network externalities affect participating groups asymmetrically; this can be especially pronounced if different sides of a platform are themselves subject to different network effects.[113] As a result, each group may respond differently to quality assurance measures imposed by the platform.

This dynamic complicates intermediation between the different sides of a financial platform: on the user side, the platform must seek to exclude bad actors and discourage unprofitable customers; on the other, it first has to vet, and then monitor, providers to ensure that they deliver positive user outcomes. Therefore, the platform must balance openness and inclusivity with security and profitability. Conceivably, there is more than one way of resolving this predicament. As a result, a platform may be afforded some flexibility when trading off these exigencies. However, the degree to which it leans one way or another is likely to depend, in large part, on its user base and competitive strategy.

Hitherto, we have focussed on the network effect as it relates to financial platforms. But what about the fintech start-ups themselves? Just like their much larger rivals, fintechs are subject to both positive and negative network

externalities. However, there is an additional dynamic which complicates their early stage expansion: when a company is small, it lacks the network effects of its larger competitors.[114] In the context of fintech, this means many scale-dependent start-ups will be pushed in the direction of partnering with a larger institution.

At the same time, a start-up that grows too quickly may suffer from growth pains.[115] In the context of fintech, this can mean undergoing greater regulatory scrutiny and/or difficulty managing an increase in customer-related issues. As a result, network dynamics leave independent fintech start-ups in a tough spot. Naturally, this pushes many toward collaboration with larger players. Of course, independent platforms can succeed (as seen in the case study above), though for many, it may prove too difficult given the exigencies of platform economics and the network effect.

CASE STUDY

Harnessing mobile networks for financial inclusion

One of the tragedies of today's financial system is the number of people who are excluded from it. Though no one knows the exact figure, it is estimated that *ca* 2 billion people living in emerging economies have little or no access to formal financial services.[116] Limited access to finance perpetuates poverty: if entrepreneurs cannot access capital, they cannot build job-creating businesses. Meanwhile, individuals cannot protect their wealth without access to financial institutions; storing one's money under the proverbial mattress leaves it vulnerable to theft while inflation erodes its value over time.

A well-functioning economy needs an inclusive financial system that directs capital to its most productive use by connecting savers and borrowers. Any system that leaves out a great number of people fails to achieve this, and thereby perpetuates inequality and poverty. Indeed, the economist Muhammed Yunus won the Nobel Peace Prize for his work relating to micro-credit in Bangladesh: with the bank he helped found, Yunus demonstrated that extending micro-loans to small entrepreneurs – who did not otherwise have access to credit – could help lift them out of poverty.[117]

Though this approach has been emulated around the world, there is still much room for improvement. Financial exclusion persists in developing countries because the infrastructure does not address the needs of poor and rural communities. Instead, financial service providers in emerging economies tend to cater to higher-income urban dwellers.[118]

However, technology is helping to foster greater financial inclusion. M-PESA is perhaps the most compelling example of this; first introduced in Kenya in 2007, this is a mobile-based payments solution run by Vodafone.[119] For some time, Kenyans had been using mobile top-up cards (ie plastic cards that contain phone credit in the form of minutes) as a substitute for cash.[120] While banking infrastructure was lacking in many areas, these cards

could be bought at small convenience stores across the country. Thus, they became a store of value for Kenyans because a plastic card is much easier to transport (and hide) than a bundle of cash. Vodaphone expanded on this dynamic by allowing users to send each other electronic money via its mobile network, which can then be redeemed for cash at convenience stores registered with M-PESA.[121]

In this way, Vodafone has effectively fused its mobile network with a nationwide network of small merchants to supplement an underdeveloped financial system. The benefits of this are far reaching as it allows urban dwellers to send funds to their friends and family in less-developed rural areas, much like immigrants in advanced economies who send money to friends and family back home.

Over time, this additional liquidity should give rise to entrepreneurship and job creation, as much as micro-loans are intended to do. Indeed, there is evidence to suggest that M-PESA is transforming Kenya's economy: according to one study, it has succeeded in lifting 2 per cent of the country's households out of poverty.[122] In this way, mobile money solutions could make a big difference across sub-Saharan Africa, where an estimated 67 per cent of adults are without formal financial services.[123] With a mobile penetration rate that is growing rapidly and projected to reach 50 per cent by 2025,[124] millions more could escape poverty thanks to solutions like M-PESA.

M-PESA's model is being emulated across Africa, either by Vodafone itself or by one of its rivals. Unfortunately, some sub-Saharan governments have imposed taxes on mobile payments, which threatens to undermine the progress made in terms of financial inclusion.[125] However, as sub-Saharan Africa already had more than 100 million mobile money users by 2016,[126] the sea change brought on by mobile payments may prove too great for any government to bungle.

In addition, the growth in trade between China and Africa is another reason to be optimistic about fintech in Africa: standing at around US$100 billion in 2008, Sino-African trade had doubled to *ca* US$200 billion by 2018.[127] Indeed, in 2019, Alipay – a Chinese mobile payments platform with more than 1 billion users[128] – announced a partnership with a Nigerian business-to-business fintech to help facilitate payments between Alipay users and African merchants.[129] Thus, emerging economies appear to be leading the way in some areas of fintech innovation: by 2018, three quarters of millennial consumers in China had used mobile payments; the corresponding figure for US and UK millennials was around 50 per cent.[130]

How can political, economic, social and technological factors affect financial inclusion?

(Suggested answer at the end of this chapter.)

Chapter summary

The internet is reshaping business–consumer relationships. Greater digitization has reduced the time and hassle of shopping around for financial products. This, combined with the public loss of faith in the financial industry as a result of the financial crisis, has been detrimental to customer loyalty.

Consumers want something new, and fintech start-ups are answering this call by harnessing technology to make finance cheaper, faster, more convenient and more accessible. By automating their operations as far as possible, these start-ups have much leaner business models than many established players.

Furthermore, fintech start-ups are able to access customer data via Application Programming Interfaces (APIs), allowing them to develop innovative and personalized solutions based on incumbent banks' most valuable asset: their customers' transactions. This development would spell disaster for large financial institutions were it not for their inherent advantages in terms of access to capital, scale and regulatory expertise. As a result, incumbents and challengers find themselves drawn together.

As a result, banks are likely to find themselves reimagined as financial platforms, becoming marketplaces for the very fintech solutions that threatened to displace them. That said, different modalities are likely to emerge, which largely depends on each bank's readiness to engage its customers with a compelling user interface. Indeed, despite the advantages of established financial institutions, there is nothing to stop a fintech start-up from setting up its own financial platform as seen in this chapter's case study on Starling Bank. Consumers want something new and will flock to the institution that offers the most convenient, holistic, and personalized financial solutions.

KEY TAKEAWAYS

The three most important ideas from this chapter are:

- Financial technology start-ups (fintechs) are encroaching on banks' territory by using technology to make financial services easier, faster and cheaper.
- This is likely to force many financial institutions to become financial platforms.
- Banks and fintechs both have competitive advantages over each other; thus collaboration, rather than competition, is a more likely route for most.

SUGGESTED ANSWERS TO DISCUSSION POINTS

A What are the strengths and weaknesses in Starling's business model?

Strengths in Starling's business model

The bank has a near-complete financial services platform, boasting borrowing, business, insurance and wealth-management solutions. The convenience of having all these solutions in one place is likely to help in attracting new customers, as well as retaining existing customers. Furthermore, the bank appears to be far ahead of many of its larger rivals in terms of the Banking as a Platform model: this gives it a 'first-mover' advantage while strengthening its reputation as an innovative bank.

In addition, Starling appears to have a strong, 'feel-good' brand because of its customer-centric ethos and ethical approach to banking. This is likely to increase customer loyalty because it appeals to customers who are disillusioned with mainstream banks. The fact that Starling has a de facto branch network via its partnership with Royal Mail gives it an edge over its digital-only fintech rivals, particularly with regard to business customers.

Weaknesses in Starling's business model

The bank relies on external partners to complete its suite of financial solutions. In this way, if there is a problem with one of these providers, it could damage Starling's reputation. Furthermore, as some of these providers are also on other platforms, this could undermine customer loyalty: though Starling technically owns the relationship with each customer, some customers may be more amenable to switching to a competing platform if they see a familiar financial provider on it. This could become especially relevant if one of Starling's providers stops servicing the bank's customers.

Furthermore, the bank's stringent ethics policy could become a problem if one of its partners fails to live up to Starling's standards. If a partner solution is used by a large portion of the Starling's customers, this could present a serious ethical dilemma for a bank that styles itself as values driven. Finally, there is the problem of potential financial exclusion: though Starling claims to take this value seriously, its platform is only accessible to users of IOS and Android smartphones.

A How can political, economic, social and technological factors affect financial inclusion?

Political

Government interference – either by way of excessive regulation or taxation – could discourage innovation and impede the adoption of fintech solutions, thereby hampering financial inclusion. On the other hand, pro-competition regulation, such as Open Banking, could encourage financial innovation, which would favour financial inclusion.

Economy

In the short term, a downturn in the global economy could lead financial institutions to become more risk averse. This would be detrimental to financial inclusion as financial service providers tend to see low-income customers as riskier. In the longer term, however, global economic growth driven by emerging economies could draw more financial institutions to emerging markets, thereby pushing more capital to the fringes, and thus increasing financial inclusion.

Social

With the free flow of information online and growing public awareness regarding environmental sustainability and inequality, it is likely that more people will become interested in financial inclusion. This will put pressure on financial institutions to offer more inclusive services. At the same time, it will inspire entrepreneurs to develop solutions that benefit financial inclusion.

Technology

Technological innovation enables financial service providers to reach more consumers digitally. This connectivity facilitates greater financial inclusion. In addition, technology enables organizations to automate the provision of financial services, thereby reducing the per unit cost of distributing financial products. Over time, this should decrease the costs to consumers, thereby making low-spec financial solutions accessible to previously financially excluded groups.

References

1,**2**,**5**,**6** Campbell, G, Rogers, M and Turner, J D (2016) *The rise and decline of the UK's provincial stock markets*, *1869–1929*, Queen's University Centre for Economic History, Working Paper 16-03, www.quceh.org.uk/uploads/1/0/5/5/10558478/wp16-03.pdf (archived at https://perma.cc/8EE3-FVU2)

3,**4** Katz, M L and Shapiro, C (1985) Network Externalities, Competition, and Compatibility, *American Economic Review*, 75 (3), 424–40 (June)

7,**92** White, L and MacAskill, A (2017) British banks set to close record 762 branches this year, *Reuters*, 23 August, uk.reuters.com/article/uk-britain-banks-branches-idUKKCN-1B31AY (archived at https://perma.cc/LW9G-6LG5)

8 Chapman, B (2018) UK bank branch closures reach 'alarming' rate of 60 per month, Which? finds, *The Independent*, 15 June, www.independent.co.uk/news/business/news/uk-bank-branch-closures-which-research-natwest-hsbc-a8399041.html (archived at https://perma.cc/ZDC6-VGU8)

9 Euromonitor, Passport (2015) in Govil, S, Whitelaw, D and Spaeth, P (2016) Accelerating global payment worldwide, Visa Inc, usa.visa.com/visa-everywhere/global-impact/accelerating-electronic-payments-worldwide.html (archived at https://perma.cc/2PTH-3XRG)

10 Gapgemini and BNP Paribas (2018) World Payments Report 2018, worldpaymentsreport.com/wp-content/uploads/sites/5/2018/10/World-Payments-Report-2018.pdf (archived at https://perma.cc/R9QC-YRUT)

11 KPMG (2017) Banking on the future: The roadmap to becoming the banking partner of Gen Y professionals, home.kpmg/content/dam/kpmg/au/pdf/2017/banking-on-the-future-edition-3.pdf (archived at https://perma.cc/LH5Q-83ZH)

12,**13**,**14**,**16**,**36** Christiansen, H (2001) Electronic Finance: Economics and Institutional Factors, OECD Financial Affairs Division, www.oecd.org/finance/financial-markets/2676135.pdf (archived at https://perma.cc/4GV2-5PAQ)

15 Fry, R (2018) Millennials projected to overtake Baby Boomers as America's largest generation, Pew Research Center, 1 March, www.pewresearch.org/fact-tank/2018/03/01/millennials-overtake-baby-boomers/ (archived at https://perma.cc/VPW6-NYAA)

17,**19**,**38** Arner, D W, Barberis, J N and Buckley, R P (2016) The Evolution of Fintech: A New Post-Crisis Paradigm?, University of Hong Kong Faculty of Law Research Paper No. 2015/047, UNSW Law Research Paper No. 2016-62, papers.ssrn.com/sol3/papers.cfm?abstract_id=2676553 (archived at https://perma.cc/2B8N-2Y85)

18 CCP Research Foundation (2017) Conduct Costs Project Report 2017, 16 August, conductcosts.ccpresearchfoundation.com/conduct-costs-results

20,**69** Ronayne, D (2019) Price Comparison Websites, Warwick Economics Research Papers, 25 April, warwick.ac.uk/fac/soc/economics/research/workingpapers/2015/twerp_1056b_ronayne.pdf (archived at https://perma.cc/Z68W-8H3M)

21 Gozman, D, Liebenau, J and Mangan, J (2018) The Innovation Mechanisms of Fintech Start-ups: Insights from SWIFT's Innotribe Competition, *Journal of Management Information System*, 35, 145–79

22 Olsen, T, Di Marzo, A, Ganesh, S and Baxter, M (2018) Wolf in Sheep's Clothing: Disruption ahead for transaction banking, Bain & Co, www.bain.com/insights/disruption-ahead-for-transaction-banking/ (archived at https://perma.cc/WMX4-GZ2A)

23 Scherer, A, Wangenheim, F and Wünderlich, N (2015) The value of self-service: long-term effects of technology-based self-service usage on customer retention, *MIS Quarterly*, 39(1), 177–200 (March)

24 C. Hoare & Co. (2019) About us, www.hoaresbank.co.uk/about-us (archived at https://perma.cc/KU38-NF68)

25 C. Hoare & Co. (2019) Cambridge expansion, www.hoaresbank.co.uk/news/c-hoare-co-cambridge-expansion (archived at https://perma.cc/9SSH-NFDM)

26,**27**,**28** Kay, J (1993) The Structure of Strategy, *Business Strategy Review*, 4 (2), 17–37 (June)

29,**33**,**130** Worldpay (2018) Global payments report: The art and science of global payments [report]

30,**56**,**59**,**60**,**62**,**80** Deloitte LLP (2017) Open banking: How to flourish in an uncertain future, www2.deloitte.com/uk/en/pages/financial-services/articles/future-banking-open-banking-psd2-flourish-in-uncertainty.html (archived at https://perma.cc/TU5W-PAGC)

31,**32**,**82** Lee, I and Shin, Y J (2018) Fintech: Ecosystem, business models, investment decisions, and challenges, *Business Horizons*, 61, 35–46

34,**39** Badi, M, Dab, S, Drummond, A, Malhotra, S, Muxi, F, Peeters, M, Roongta, P, Strauß, M and Sénant, Y (2018) Global Payments 2018: Reimagining the Customer Experience, The Boston Consulting Group, 18 October, www.bcg.com/publications/2018/global-payments-reimagining-customer-experience.aspx (archived at https://perma.cc/VA6T-8ZJH)

35 PricewaterhouseCoopers and Startupbootcamp (2017) The state of fintech, www.pwc.com/sg/en/publications/assets/fintech-startupbootcamp-state-of-fintech-2017.pdf (archived at https://perma.cc/R2YG-6CRA)

37 Swinton, S and Roma, E (2018) Why Big UK Banks Are Worried about Open Banking, Forbes.com, 15 March, www.bain.com/insights/why-big-uk-banks-are-worried-about-open-banking-forbes/ (archived at https://perma.cc/QEQ9-ZXXB)

40,**41**,**42**,**45**,**47**,**53** Open Banking Limited (2018) Background to Open Banking, www.openbanking.org.uk/wp-content/uploads/What-Is-Open-Banking-Guide.pdf (archived at https://perma.cc/N5FP-LGPH)

43,**44**,**61** KPMG International (2017) PSD2 Strategy: Comply, Compete or Innovate?, assets.kpmg/content/dam/kpmg/nl/pdf/2017/sector/financiele-dienstverlening/psd2-strategy-comply-compete-innovate3.pdf (archived at https://perma.cc/3X3R-XSVV)

46 Open Banking Limited (2019) About us, www.openbanking.org.uk/about-us/ (archived at https://perma.cc/8ZGR-N236)

48 Chopra, A (2017) What is an API?, 9 October, www.quora.com/What-is-an-API-4?share=1 (archived at https://perma.cc/7PXE-YBUG)

49,**50**,**52**,**55**,**63** Zachariadis, M and Ozcan, P (2017) The API Economy and Digital Transformation in Financial Services: Open Banking, Swift Institute, 15 June, swiftinstitute.org/research/impact-of-open-apis-in-banking/ (archived at https://perma.cc/73S7-T5YG)

51 Jacobson, D, Brail, G and Woods, D (2011) *APIs: A Strategy Guide*, O'Reilly Media, Sebastopol, CA

54 TransferWise (2019) TransferWise API, api-docs.transferwise.com/#transferwise-api (archived at https://perma.cc/3G2L-QEW9)

57 Brown, J R and Goolsbee, A (2000) Does the Internet Make Markets More Competitive? NBER Working Paper No. 7996, www.nber.org/papers/w7996 (archived at https://perma.cc/9Q9U-MEFB)

58 Tardi, C (2019) White Label Product, Investopedia, 10 April, www.investopedia.com/terms/w/white-label-product.asp (archived at https://perma.cc/2J87-296S)

64,**66** Bouvier, P (2016) Exploring Banking as a Platform (BaaP) Model, Finiculture, 19 March, finiculture.com/exploring-banking-as-a-platform-baap-model/ (archived at https://perma.cc/DR64-43YC)

65,**75** Rysman, M (2009) The Economics of Two-Sided Markets, *Journal of Economic Perspectives*, 23 (3), 125–43

67,**68**,**71** Porter, M E (1980), *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, Free Press, New York

70 Wesleyan Assurance Society (2019) About us, www.wesleyan.co.uk/about-us/ (archived at https://perma.cc/8T5G-B8GU)

72,**77** Bonchek, M and Choudary, S P (2013) Three elements of a successful platform strategy, *Harvard Business Review*, 31 January, hbr.org/2013/01/three-elements-of-a-successful-platform (archived at https://perma.cc/H332-9V4C)

73,**76**,**78**,**105** Zhu, F and Iansiti, M (2019) Why Some Platforms Thrive and Others Don't, *Harvard Business Review*, 97 (1), 118–25 (January–February)

74,**89** Starling Bank Limited (2020) Personal current account, www.starlingbank.com/current-account/ (archived at https://perma.cc/SC9A-98AP)

79 International Organization of Securities Commissions (2017) IOSCO Research Report on Financial Technologies (Fintech), www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf (archived at https://perma.cc/N5XH-CB5R)

81,**83**,**84**,**85**,**86** MagnaCarta Communications and ACI Worldwide (2017) Innovation, distributed: Mapping the fintech bridge in the open source era, www.aciworldwide.com/-/media/files/collateral/other/aci-magna-carta-fintech-disruptors-report.pdf (archived at https://perma.cc/3PW8-N3S2)

87 CapGemini and LinkedIn (2018) World fintech report 2018, www.capgemini.com/wp-content/uploads/2018/02/world-fintech-report-wftr-2018.pdf (archived at https://perma.cc/4UDU-FNQC)

88 Starling Bank Limited (2019) About us, www.starlingbank.com/media/ (archived at https://perma.cc/D8PM-MCYD)

90 Amazon Web Services (2019) Breaking the Banking Mould: How Starling Bank is disrupting the banking industry, aws.amazon.com/solutions/case-studies/starling/ (archived at https://perma.cc/D3AF-QBPE)

91 Starling Bank Limited (2018) Introducing: Cash deposits at the Post Office, 12 November, www.starlingbank.com/blog/post-office-deposits/ (archived at https://perma.cc/JW7W-EEMA)

93 Starling Bank Limited (2018) Starling for business open for sole traders, 4 June, www.starlingbank.com/blog/sole-trader-bank-account/ (archived at https://perma.cc/8K7R-VVL6)

94 Smith, O (2019) Starling beats Tide to offering multi-director business accounts, Altfi, 25 July, www.altfi.com/article/5576_starling-beats-tide-offering-multi-director-business-accounts (archived at https://perma.cc/RNK7-5XXV)

95 Starling Bank Limited (2019) Introducing: Multi-owner mobile business accounts for limited companies, 25 July, www.starlingbank.com/blog/business-account-multiple-people-significant-control/ (archived at https://perma.cc/9JQS-LMQM)

96 Bannister, D (2017) Transaction Banking Survey: Challenges & imperatives of real-time payments & liquidity, Ovum Consulting, ovum.informa.com/resources/product-content/2017-transaction-banking-survey (archived at https://perma.cc/C3X4-MMJS)

97,**98** Starling Bank Limited (2019) Our ethics statement, www.starlingbank.com/about/ethics-statement/ (archived at https://perma.cc/5Q66-9ECW)

99,**100** Fotis, M (2019) British Bank Awards 2019: Winners, Smart Money People, 8 March, smartmoneypeople.com/news/post/british-bank-awards-2019-winners (archived at https://perma.cc/3KNP-L2NP)

101 Boden, A (2018) Welcome to Banking-as-a-Service, Starling Bank Limited, 10 October, www.starlingbank.com/blog/platformification-of-banking-industry/ (archived at https://perma.cc/ZUM6-K3XK)

102 Starling Bank Limited (2019) Direct Line Group partners with leading digital bank Starling, 24 June, www.starlingbank.com/news/direct-line-group-partnership-churchill-insurance/ (archived at https://perma.cc/9JJB-M45P)

103 Starling Bank Limited (2019) Introducing: CreditLadder, our new Starling Marketplace partner, 12 July, www.starlingbank.com/blog/introducing-creditladder-starling-marketplace/ (archived at https://perma.cc/V43B-9347)

104 Starling Bank Limited (2019) Annual report and consolidated financial statements for the year ended 30 November 2018, www.starlingbank.com/docs/Starling-bank-annual-report-2017-18.pdf (archived at https://perma.cc/JF3K-CV2L)

106 Leibenstein, H (1950) Bandwagon, snob, and Veblen effects in the theory of consumers' demand, *The Quarterly Journal of Economics*, 64 (2), 183–207 (May)

107 Kimovil (2020) All smartphone brands, www.kimovil.com/en/all-smartphone-brands (archived at https://perma.cc/CQ93-7XSU)

108,**109** Liebowitz, S J and Margolis, S E (1994) Network Externality: An Uncommon Tragedy, *Journal of Economic Perspectives*, 8 (2), 133–50

110 Smith, A (1776) An Inquiry into the Nature and Causes of the Wealth of Nations, www.gutenberg.org/files/3300/3300-h/3300-h.htm#chap17 (archived at https://perma.cc/P3V7-CVLQ)

111 Cheung, S L (2016) Diseconomies of Scale, *The Palgrave Encyclopedia of Strategic Management*, 25 June, link.springer.com/referenceworkentry/10.1057/978-1-349-94848-2_66-1 (archived at https://perma.cc/4BEM-3NRQ)

112 Acemoglu, D, Malekian, A and Ozdaglar, A (2016) Network Security and Contagion, *Journal of Economic Theory*, 166, 536–85

113 Bakos, Y and Katsamakas, E (2008) Design and Ownership of Two-Sided Networks: Implications for Internet Platforms, *Journal of Management Information Systems*, 25 (2), 171–202

114,**115** Weitzel, T, Wendt, O and Westarp, F V (2000) Reconsidering network effect theory, in: European Conference on Information Systems, Vienna: Association for Information Systems, https://aisel.aisnet.org/ecis2000/index.2.html (archived at https://perma.cc/LD4B-JJ7S)

116 Larios-Hernandez, G J (2017) Blockchain entrepreneurship opportunity in the practices of the unbanked, *Business Horizons*, 60 (6), 865–74 (November–December)

117 The Nobel Foundation (2006) Grameen Bank, Facts, www.nobelprize.org/prizes/peace/2006/grameen/facts/ (archived at https://perma.cc/P5Z6-FV2P)

118 Doi, Y (2010) Financial Inclusion, Poverty Reduction and Economic Growth, World Bank Group, 10 November, www.worldbank.org/en/news/opinion/2010/11/10/financial-inclusion-poverty-reduction-economic-growth (archived at https://perma.cc/98YR-Z7F8)

119,**120**,**121** Vodafone (2019) M-PESA, www.vodafone.com/content/index/what/m-pesa.html# (archived at https://perma.cc/KCU6-LMF5)

122 Suri, T and Jack, W (2016) The long-run poverty and gender impacts of mobile money, *Science*, 354, 1288–92 (December)

123 World Bank (2018) The Little Data Book on Financial Inclusion 2018, openknowledge.worldbank.org/handle/10986/29654 (archived at https://perma.cc/9E7F-4RQK)

124 GSM Association (2019) The Mobile Economy: Sub-Saharan Africa, www.gsma.com/r/mobileeconomy/sub-saharan-africa/ (archived at https://perma.cc/AGD6-RCVG)

125 Ndung'u, N (2019) Taxing mobile phone transactions in Africa: Lessons from Kenya, The Brookings Institution, 5 August, www.brookings.edu/research/taxing-mobile-phone-transactions-in-africa-lessons-from-kenya/ (archived at https://perma.cc/GMY6-3A6Q)

126 McKinsey & Company (2017) Mobile financial services in Africa: Winning the battle for the customer, www.mckinsey.com/industries/financial-services/our-insights/mobile-financial-services-in-africa-winning-the-battle-for-the-customer (archived at https://perma.cc/KY5C-KBGM)

127 China–Africa Research Initiative (2019) Data: China–Africa trade, Johns Hopkins School of Advanced International Studies, www.sais-cari.org/data-china-africa-trade (archived at https://perma.cc/AVH2-4KQL)

128 Alipay (2019) About Alipay, intl.alipay.com/ihome/index.htm (archived at https://perma.cc/Z3U9-TFE2)

129 PYMTS (2019) Flutterwave Teams With Alipay To Enable China–Africa Transactions, 30 July, www.pymnts.com/news/mobile-payments/2019/flutterwave-teams-with-alipay-to-enable-china-africa-transactions/ (archived at https://perma.cc/4MUU-GG7Y)