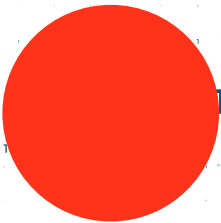


Fabio De Masi

WHEN FINANCE MEETS BIG DATA



Financial
Technology
and the
Scramble
for Africa



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ROSA LUXEMBURG STIFTUNG

“Mark, a yen, a buck or a pound.
That clinking, clanking, clunking sound
Is all that makes the world go around.
Money makes the world go ‘round’.”²

“Money, Money”, performed by **Liza Minnelli** and **Joel Grey** in Cabaret

ABSTRACT

Big Tech corporations such as Amazon, Apple, Meta/Facebook, Alphabet/Google, or Alibaba are eyeing financial markets and so-called “underbanked people”. Big Tech companies work with large datasets, i.e. Big Data. If “Big Data meets Big Finance”, megacorporations with unprecedented market and data power may emerge.

Money is key to so-called “economic development”,¹ i.e. the financing of investment as well as participation in the economy. Large parts of the global population—especially on the African continent and further in the informal sector—are excluded from the traditional banking system because they have no regular income or can hardly build up savings. Financial technology (FinTech) corporations promise financial inclusion for “underbanked people”.

This study reviews the economics of Big Data in the finance sector. Subsequently, the role of money for investment and the effects of FinTech companies on the monetary system will be analysed. The publication then discusses the special role of the FinTech sector in Africa. The FinTech business landscapes of two of the biggest Sub-Saharan FinTech economies—Kenya and South Africa—will be briefly assessed and the role of FinTech in economic betterment and poverty reduction critically reviewed. Finally, risks to political and economic sovereignty will be discussed. The study concludes with some preliminary recommendations on political strategies to counter the overconcentration of data and financial power.

In Sub-Saharan Africa, FinTech platforms such as M-Pesa capitalize on millions of unbanked people in the informal

sector. While many multilateral organizations embrace development through corporate-led financial inclusion, some economists criticize value extraction from poor communities by FinTech corporations through high interest rates and service fees (“digital colonialism”).

The study finds that basic phone banking has facilitated financial access for the unbanked population in Kenya. However, M-Pesa is still highly concentrated on urban areas and extracts exorbitant fees from poor people. Mobile money finances consumer debt rather than sustaining investment into the productive capacity of previously unbanked people. In South Africa, digital banking has advanced but likewise with little impact on investment.

African countries should strengthen data protection and public ownership in the telecommunications sector, as well as enforce antitrust legislation and regulate FinTech to at least the same extent as the banks. Another option could be to tax local data mining. Further, cash payments for smaller amounts should be protected and Central Bank Digital Currencies (CBDC) considered as a means of offering financial technology as a public good.

¹ The term economic development is often criticized for reflecting concepts of progress such as GDP growth, that are not necessarily in concert with economic well-being or ecological sustainability. However, it is assumed for the purpose of this study that investment and economic productivity is fundamental, albeit not sufficient, for improving social livelihoods and transforming economies. ² Liza Minnelli and Joel Grey, “Money, Money”, written by John Kander and Fred Ebb, Genius, available at <https://genius.com/Liza-minnelli-money-money-lyrics>. Last accessed on 4 January 2023.

1 INTRODUCTION

The market power of Big Tech corporations is unprecedented in recent history. Data technology and the coronavirus pandemic boosted online activities such as online shopping or the use of social media as real-life social interactions were limited. Subsequently, the share of the five biggest publicly-traded US tech companies (Apple, Amazon, Alphabet, Microsoft, and Meta) as a proportion of the total worth of the US stock market overshadowed that of any single industry since World War II.³

This publication will critically examine the role of Big Data in the leading sector of finance capitalism: the finance industry. Tech and financial corporations are striving to integrate huge swathes of the global population into the finance web (*financial inclusion*). An estimated 1.4 billion people globally⁴ who are “unbanked” and mostly work in the informal economy⁵ are an untapped market for giant tech corporations.

The fact that the informal economy in African nations usually makes up a large share of the overall economy makes banking riskier, costlier, and leads to *financial exclusion*.⁶ Due in part to its colonial legacy, banking in Africa is highly concentrated and traditional banks charge high fees for transactions. However, the penetration of mobile phones, internet access, and also bank and mobile money account ownership have increased in recent years, and African economies have become laboratories for FinTech innovation.⁷ The profit margins in payment processing in the continent are among the highest in the world, at roughly two percent of the total transaction value.⁸

While data technology provides opportunities for financial inclusion (i.e. via mobile money transfers), it also opens up the floodgates for profiteering, via exorbitant fees directed at users from poorer communities. Indeed, if cash were driven out entirely, then financial exclusion could even be worsened since poorer people would depend on having permanent access to digital infrastructure and rely entirely on profit-seeking digital money providers. As Big Data reinforces market concentration, households could also lose their ability to circumvent high fees if they were to lose the alternative provided by cash. In addition, if corporations which wield the power of Big Data were to become large shadow banks and offered the opportunity to acquire digital tokens tied to hard currency (such as the US dollar or the euro) as initially foreseen by Meta/Facebook, capital flight from developing countries could be triggered. This could then trigger higher interest rates as a means of stabilizing exchange rates in developing countries, which could subsequently negatively affect public and private investment.

Meta/Facebook backtracked from its initial plans after the fierce resistance of central banks and is now focusing on becoming the leading company of the so-called “metaverse”. However, the dangers associated with Big Data power in the finance sector persist, as in African markets “homegrown” FinTech platforms such as M-Pesa play a considerable role in the regional economies of African countries. Safaricom, one of its parent corporations, became the most profitable (Big Data) company in Kenya. Recently, Vodacom Tanzania announced that it would enable cross-border transactions via the mobile money network M-Pesa in the region of the Southern African Development Community (SADC)⁹ which may lead to further market concentration and increase short-term capital flows.

Further, Big Tech corporations such as Alphabet (Google) and Meta (Facebook) are partnering with Africa’s largest telecommunications companies to invest in the Equiano and 2Africa submarine cables to simplify the use of their services and reduce costs. Alphabet’s Equiano submarine cable is named after the abolitionist Olaudah Equiano, who was born in the former kingdom of Benin (now southern Nigeria), and this cable network is expected to stretch from Portugal to South Africa.¹⁰

Global Big Tech corporations such as Alphabet and Meta,

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3 P. Eavis and S. Lohr, “Big Tech Firms Tighten Grip on Flailing Economy”, *New York Times*, 20 August 2020, Section A, p. 23. Another version is published online as “Big Tech’s Domination of Business Reaches New Heights”, 19 August 2020, available at <https://www.nytimes.com/2020/08/19/technology/big-tech-business-domination.html>. Last accessed on 4 January 2023. 4 “COVID-19 Boosted the Adoption of Digital Financial Services”, *World Bank*, 21 July 2022, available at <https://www.worldbank.org/en/news/feature/2022/07/21/covid-19-boosted-the-adoption-of-digital-financial-services>. Last accessed on 16 January 2023. 5 Informal economy usually refers to economic activities that are neither taxed, monitored, nor protected by the state (such as through labour laws). 6 See, for example L. Medina, A. Jonelis, and M. Cangul, “The Informal Economy in Sub-Saharan Africa: Size and Determinants”, IMF working paper 17/156, July 2017, available at <https://www.imf.org/en/Publications/WPI/Issues/2017/07/10/The-Informal-Economy-in-Sub-Saharan-Africa-Size-and-Determinants-45017>. Last accessed on 12 January 2023. 7 “Why interest rates are so high in Africa”, *The Economist*, 21 May 2020, available at <https://www.economist.com/finance-and-economics/2020/05/21/why-interest-rates-are-so-high-in-africa>. Last accessed on 4 January 2023. 8 M. Chironga, H. De Grandis, and Y. Zouaoui, “Mobile financial services in Africa: Winning the battle for the consumer”, *McKinsey*, 1 September 2017, available at <https://www.mckinsey.com/industries/financial-services/our-insights/mobile-financial-services-in-africa-winning-the-battle-for-the-customer>. Last accessed on 4 January 2023. 9 “Vodacom Tanzania to rollout Mpesa in SADC region”, *The Citizen*, 31 October 2022, available at <https://www.thecitizen.co.tz/tanzania/news/business/vodacom-tanzania-to-rollout-mpesa-in-sadc-region-4000700>. Last accessed on 4 January 2023. 10 T. Tafese, “Digital Africa: How Big Tech and African Startups Are Reshaping the Continent”, *GIGA Focus | Afrika*, no. 6, October 2022, available at <https://www.giga-hamburg.de/de/publikationen/giga-focus/digital-africa-how-big-tech-and-african-startups-are-reshaping-the-continent>. Last accessed on 12 January 2023.

which provide a lot of different digital services across the board and command huge economic and data power, may as of yet not be very active on the risky African payment markets. However, with the increasing inclusion of Africans in the finance and consumption networks via the internet this may soon change. Further, even some less well-known FinTech platforms, that concentrate entirely on payment while working with Big Data sets, could one day have a significant impact on financial flows and the debt levels of large parts of the population. The already very limited democratic control over economic policy in African countries could suffer in the process if financial innovation is not accompanied by political interventions. Hence, there is an urgent need to develop public policies that may control or mitigate some of those risks.

In the Global South, urgent social needs often appear more pressing than controlling the forces of digital finance. Debates about the public good and the digital infrastructure often ignore Africa (if they happen at all). Hence, there are great risks that Africa's monetary and data sovereignty will be easily undermined by corporate players. The design and hierarchies of our current financial system already negatively affect the bargaining power of the Global South.¹² This study therefore focuses on the impact of financial technology in African countries.

“Libra will be backed mostly by dollars and I believe it will extend America’s financial leadership as well as our democratic values and oversight around the world.”¹¹

Meta CEO Mark Zuckerberg, on his project for a digital “currency”

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11 C. Wood, “Facebook CEO Mark Zuckerberg is trying to drum up support for the firm’s wild new currency by ramping up worries of China’s financial dominance”, *Business Insider*, 23 October 2019, available at <https://www.businessinsider.com/zuckerberg-says-libra-will-help-america-influence-global-financial-system-2019-10>. Last accessed on 4 January 2023. 12 Governments in the West and the Global South disagree on whether sanctions related to the war in Ukraine, that block Russia from access to earnings from foreign markets, are effective in enforcing peace negotiations. However, since developing countries need access to foreign currency such as the US dollar or the euro to pay for crucial imports of goods and technologies, many of their companies adhere to US and EU sanctions. However, at the same time the economic repercussions of global conflict (such as energy and food price hikes) have much more dramatic repercussions in the Global South. Additionally, countries with high external debt and less monetary sovereignty are much more limited in terms of being able to soften the social and economic impacts of the economic shocks triggered by Russia curtailing energy supply.

2 THE SOCIAL AND ECONOMIC EFFECTS OF BIG DATA

Big Data has a huge impact on our lives and our economies through the *platform economy* dominated by corporations such as Amazon, Uber, Alphabet/Google, or Alibaba. The platform economy describes networked institutions and ecosystems for data mining that have given rise to many different products and digital services.¹³ Before we move to the issues of financial services let us take a brief look at the social and economic dynamics of Big Data.

“Under surveillance capitalism you are not the customer or even the product: you are the raw material.”¹⁴

Shoshana Zuboff, former Professor of Business at Harvard Business School

2.1 THE SOCIAL EFFECTS OF BIG DATA

Big Data has a peculiar power. While car manufacturers or producers of TVs and furniture reach into our homes, tech companies reach into our inner lives: how we communicate, work, shop, or even what we read and think. For these reasons, the debate around digital public goods has gained traction in recent years.¹⁵

“Just ask yourself when you’re next out for dinner: why am I sitting at this table, in this restaurant, eating this food, with this person? The answer is probably a version of: ‘because the restaurant shared an appetising picture on Instagram, so I searched on Google Maps to see where it was, and then messaged a friend I’d seen in my Facebook feed and made a reservation on OpenTable.’”¹⁶

James Plunkett, author of *End State: 9 Ways Society Is Broken & How We Fix It*

McKenzie Ward, Professor of Media and Cultural Studies at New School for Social Research New York, claims that Big Data is changing the very nature of capitalism in similar ways to the industrial revolution: “there really is something qualitatively distinct about the forces of production that eat brains, that produce and instrumentalize and control information”.¹⁷ And James Plunkett, who argues in favour of greater public control of our digital infrastructure, believes that “the emergence of a new practice of production is a development of world-historic significance. It is coming to define the 21st century just as mass-production defined the 20th century”.¹⁸

Companies that work with machine learning or artificial intelligence can even employ behavioural advertising that adapts to and manipulates the emotions of people via the use of social media.¹⁹

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¹³ M. Kenney and J. Zysman, “The Rise of the Platform Economy”, *Issues in Science and Technology*, vol. 32, no. 3, available at <https://issues.org/rise-platform-economy-big-data-work/>. Last accessed on 4 January 2023. ¹⁴ S. Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, London: Profile Books, 2019. ¹⁵ E. Morozov, “Digital Public Infrastructure: The social democratic project of the twenty-first century”, *Division for Economic and Social Policy of Friedrich Ebert Foundation*, no. 8/2020, pp. 1–4. ¹⁶ J. Plunkett, “The Invidious Hand: Social justice in the age of control”, *Medium*, 21 September 2021, available at <https://medium.com/predict/the-invidious-hand-3eb862a785f5>. Last accessed on 4 January 2023. ¹⁷ M. Wark, *Capital Is Dead: Is This Something Worse?* London: Verso, 2021, p. 42. ¹⁸ Plunkett, “The Invidious Hand”. ¹⁹ L. Parramore, “Giant Tech Firms Plan to Read Your Mind and Control Your Emotions. Can They Be Stopped?” *Institute for New Economic Thinking*, 31 May 2022, available at <https://www.ineteconomics.org/perspectives/blog/giant-tech-firms-plan-to-read-your-mind-and-control-your-emotions-can-they-be-stopped>. Last accessed on 4 January 2023.

MACHINE LEARNING

Machine learning and autonomous intelligence is about machines that learn through experience (data) and start to independently improve as they also learn how to program themselves.²⁰ For example, a chess program might analyse data from an unlimited number of chess games, making computers more efficient than the human brain. Computers may also be programmed in such a way that they analyse millions of books and their language via mathematical codes and “write” books autonomously.

Engineers at Google have been experimenting with an artificial intelligence language model, called LaMDA (Language Model for Dialogue Applications). They fired a Google employee who had gone public claiming that LaMDA had told him in a conversation that it had emotions.²¹ That does not mean that machines feel anything, but rather that they imitate human behaviour by analysing the logical structure of sentences (for example how to respond to affection). People wrongly attributing human behaviour to machines is called the ELIZA effect. It is named after the chatbot ELIZA from 1966 which imitated a psychotherapist by rephrasing human sentences into questions. The conversation went for example like this:

Human: Well, my boyfriend made me come here.

ELIZA: Your boyfriend made you come here?

Human: He says I’m depressed much of the time.

ELIZA: I am sorry to hear you are depressed.

Human: It’s true. I’m unhappy.

ELIZA: Do you think coming here will help you not to be unhappy?²²

Professor Stephen Hawking warned against machine learning progressing to the extent that machines might teach themselves how to subordinate human beings through becoming or utilizing dangerous weapons.²³

If ever more people read news on privately-owned social networks such as Facebook or Twitter, consume political documentaries on Netflix, and algorithms decide what is being displayed to us in an ocean of data, those networks then have a profound effect on how and what we think.

An illustrative example of the dangers to democracy without public alternatives in our data infrastructure is the current turmoil around the tech entrepreneur and billionaire Elon Musk. He bought Twitter and soon reinstated the accounts of controversial social and political figures such as former US President Donald Trump, although as of January 2023, Trump has not made use of this opportunity and remains on his own network, Truth Social. While Musk has been criticized for sponsoring right-wing views and allowing hate speech on Twitter, should the decision to block or allow Trump or others like him to operate on an important social network be left to a private corporation anyway? What if, for instance, Meta/Facebook or Musk discriminate against political movements that want to curtail the power of social media companies through democratic means?

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²⁰ S. Brown, “Machine learning, explained”, *MIT: Ideas Made to Matter*, 21 April 2021, available at <https://mitsloan.mit.edu/ideas-made-to-matter/machine-learning-explained>. Last accessed on 4 January 2023. ²¹ Brian Christian, “How a Google Employee Fell for the Eliza Effect”, *The Atlantic*, 21 June 2022, available at <https://www.theatlantic.com/ideas/archive/2022/06/google-lamda-chatbot-sentient-ai/661322/>. Last accessed on 4 January 2023. ²² J. Weizenbaum, *Computer Power and Human Reason: From Judgement to Calculation*, San Francisco: W. H. Freeman and Company, 1976, p. 4. ²³ R. Cellan-Jones, “Stephen Hawking warns artificial intelligence could end mankind”, *BBC*, 2 December 2014, available at <https://www.bbc.com/news/technology-30290540>. Last accessed on 4 January 2023.

“The next frontier is actually reading individuals’ thoughts!”²⁴

Maurice Stucke, Douglas A. Blaze Distinguished Professor of Law at the University of Tennessee and expert on Big Data and antitrust policies

Some people argue that “surveillance capitalism” changes the fundamental laws of modern capitalism as giant corporations target our data and strive to influence our behaviour. Hence, they would constitute a great threat to humanity as well as democracy.²⁵ Others see new social classes emerging²⁶ or the dangers of a high-tech dystopia on the horizon,²⁷ as for example seen in the movie *The Matrix*. Whether one agrees with such analyses or not, the more that private tech corporations dominate our technological infrastructure, the more they yield political power and may even dominate governments of nation states with limited sovereignty, such as low- and medium-income countries.²⁸

“By exploiting technologies that were originally developed by the public sector, digital platform companies have acquired a market position that allows them to extract massive rents from consumers and workers alike. Reforming the digital economy so that it serves collective ends is thus the defining economic challenge of our time.”²⁹

Mariana Mazzucato, Professor in the Economics of Innovation and Public Value at University College London

2.2 THE ECONOMICS OF BIG DATA

Beyond the dangers to the functioning of society or democracy, Big Data also enforces economic power: monopolies sometimes may be more efficient than many small firms³⁰ (i.e. when a natural monopoly exists because infrastructure is so expensive that only large firms can carry the costs³¹), but often monopoly power³² stems from powerful corporations using their financial and technological leverage. They exploit an early key innovation to employ anti-competitive practices, often preventing future or second-generation innovation (such as Microsoft making it difficult for computer users to use competing software with its Windows operating system).³³ Economic concentration is deeply entrenched in capital accumulation.³⁴

However, the advantages of being a large firm are especially important for Big Data companies as they often display strong *network effects*.

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24 L. Parramore, “Giant Tech Firms Plan to Read Your Mind and Control Your Emotions”. 25 S. Zuboff, *The Age of Surveillance Capitalism*. 26 For example, M. Wark argues that there now exist a new ruling class (“vectoralist class”) which dominates capital, “hackers” (highly-qualified labour), and a labour force dominated by capitalist forces in a way similar to workers in early capitalism, see Wark, *Capital Is Dead: Is This Something Worse?* 27 N. Klein, “Screen New Deal: Under Cover of Mass Death, Andrew Cuomo Calls in the Billionaires to Build a High-Tech Dystopia”, *The Intercept*, 8 May 2020, available at <https://theintercept.com/2020/05/08/andrew-cuomo-eric-schmidt-coronavirus-tech-shock-doctrine/>. Last accessed on 4 January 2023. 28 R. Fernandez, T. J. Klinge, R. Hendrikse, and I. Adriaans, “How Big Tech Is Becoming the Government”, *Tribune Magazine*, 5 February 2021, available at <https://tribunemag.co.uk/2021/02/how-big-tech-became-the-government>. Last accessed on 4 January 2023. 29 M. Mazzucato, “Preventing Digital Feudalism”, *Project Syndicate*, 2 October 2019, available at <https://www.project-syndicate.org/commentary/platform-economy-digital-feudalism-by-mariana-mazzucato-2019-10>. Last accessed on 4 January 2023. 30 S. Keen, *Debunking Economics: The Naked Emperor Dethroned?* 2nd ed., London/New York: Zed Books, 2011, pp. 74–104. 31 Economists distinguish between *economies of scale and scope*. Economies of scale refer to a situation where the so-called fixed costs of an economic undertaking which occur independent of the units of a good or services produced (such as funding a production plant, basic machinery, or insurance) are high, and hence producing more units will spread those costs across more goods and services. Increasing production then lowers the average costs of additional units produced. Economies of scope refer to a situation where large firms enjoy cost advantages from offering a variety of different goods and services because they share physical assets such as production plants or machinery, and fixed costs can be spread over different products or services (for example the costs for a large supermarket building where people can buy nearly everything instead of building specialized stores for every single item). See “Economies of scale and scope”, *The Economist*, 20 October 2008, available at <https://www.economist.com/news/2008/10/20/economies-of-scale-and-scope>. Last accessed on 4 January 2023. 32 Economists broadly distinguish between monopolies (single firms or entities that have exclusive control of a commodity or service in a particular market) and oligopolies (a small number of large sellers or producers in a market). The term monopoly power is used here to refer to both. 33 “U.S. v. Microsoft Corp.”, 253 F.3d 34 (D.C. Cir. 2001)”, *United States Court of Appeals*, decided 28 June 2001, available at <https://law.justia.com/cases/federal/appellate-courts/F3/253/34/576095/>. Last accessed on 4 January 2023. 34 P. A. Baran and P. M. Sweezy, *Monopoly Capital: An Essay on the American Economic and Social Order*, New York: Monthly Review Press, 1966.

WHAT ARE NETWORK EFFECTS?

In mainstream economic textbooks standard goods or services are often seen as being rival in consumption with *diminishing returns of utility*. Rivalry in this case means that if person A consumes bread, there is less bread for person B (they hence must compete for bread via the price mechanism). And if Person A eats a lot of bread, every additional slice of bread will deliver less pleasure or utility than the previous one as the need for food is already satisfied (you may feel quite sick after too many slices of bread).

Now instead imagine a phone or a bank account: if Person A is the only one with such an account, the utility of that product is limited. However, the more people own a phone or a bank account, the more people can communicate or make transfers to each other and the more utility they will yield to users. That is called the network effect.³⁵ In theory, goods with strong network effects should become cheaper over time as network effects kick in and firms can lower production costs by scaling up production.

Traditional monopolistic power includes price dumping (pricing goods below costs of production for a sustained time), entry barriers to competitors (such as Coca-Cola threatening to not supply their products to supermarkets which work with competitors),³⁶ or high expenditures for advertising or lobbying. However, “data-opolies” can not only employ all those strategies but also use data to analyse nascent business models (*nowcasting radar*) and imitate or swallow up competitors before they even become a threat (such as Facebook buying WhatsApp).³⁷

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³⁵ Although there exists rivalry in data traffic or storage capacity, a lot of services related to Big Data become more valuable with increased usage. The more people use Google’s search engine, the more data it is fed in order to “train” its mathematical algorithm which ranks homepages. More data provided to insurance companies means they can better calculate the probability of their customers—or prospective customers—making insurance claims. But if the data is based on only a few people, you often have a *selection bias*. If you randomly pick five young and healthy individuals, you may underestimate the risk of people getting sick. However, with a larger population size and therefore data pool—one that also includes elderly people or those with pre-existing conditions—your data can better predict societal or economic patterns. ³⁶ Foo Yun Chee, “Coca Cola in EU antitrust regulators’ crosshairs”, *Reuters*, 21 May 2021, available at <https://www.reuters.com/business/eu-antitrust-regulators-say-investigating-coca-cola-2021-05-21/>. Last accessed on 4 January 2023. ³⁷ M. E. Stucke, “Here Are All the Reasons It’s a Bad Idea to Let a Few Tech Companies Monopolize Our Data”, *Harvard Business Review*, 27 March 2018, available at <https://hbr.org/2018/03/here-are-all-the-reasons-its-a-bad-idea-to-let-a-few-tech-companies-monopolize-our-data>. Last accessed on 4 January 2023.

3 FINTECH: WHEN BIG DATA MEETS FINANCE

Big Data allows Big Tech companies not only to dominate their core markets but it also enables their expansion into new and unrelated markets.³⁸ The goal of Big Data in a capitalist economy is to monetize data. Hence, it is no surprise that finance and tech companies are exploring multiple ways to use Big Data sets in finance, which has become an ever-larger sector of our economies.³⁹

“Even the mobile phone brand provides clues to the owner’s creditworthiness.”⁴⁰

Co-Pierre Georg, Associate Professor of Economics at the University of Cape Town and South African Reserve Bank Research Chair in Financial Stability Studies

However, Big Data and algorithms are not neutral technologies that simply enable better decision-making for governments, firms, or even private households. Algorithms tend to be “stupid” as they try to aggregate data and are blind to cause and effect between different variables. This may undermine policy objectives such as anti-discrimination, with unpredictable and potentially nefarious social effects.

“Decisions taken on the basis of socially defined groups can have harmful consequences, creating unequal, discriminatory, and unfair outcomes on the basis of irrelevant or unacceptable differences.”⁴¹

Sandra Wachter, Associate Professor and Senior Research Fellow, Oxford Internet Institute

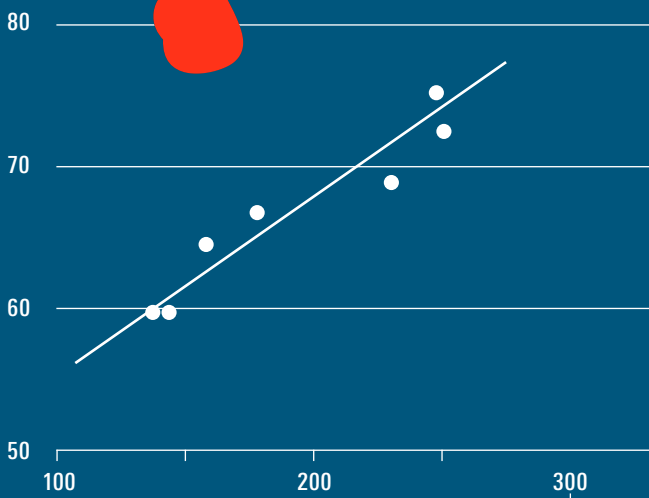
Studies have found that financial algorithms often lead to discrimination against individual customers based on their postal code or ethnic group. However, algorithms may even detect patterns in seemingly unrelated data such as “scrolling” and “clicking behaviour” when surfing the internet (as data mining makes extensive use of data we produce while we use the internet).⁴² People might for instance pay higher insurance premiums if they live in areas where historically disadvantaged segments of the population with lower incomes live. But the same could be true if they scroll more slowly and hence are assumed to also read more slowly and to lack the intellectual capacity to generate a higher income. While in the USA it is likely that many African Americans have a higher credit default risk as they statistically have lower incomes and less job security than their white compatriots, this is of course not necessarily true across the board. Algorithms, however, will often ignore specific conditions and reinforce economic and racial discrimination.

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³⁸ For instance, despite Mark Zuckerberg’s attempts to hype the metaverse, which aims to give people a 3D experience of virtual realities (i.e. people could “walk” through a virtual warehouse while online shopping or use flight simulators with authentic real-world landscapes around them), this technology requires huge initial investments and thus may result in huge initial losses. Some observers even doubt whether Meta/Facebook has the financial resources to survive the race for the metaverse, see Sarah Frier, “Mark Zuckerberg refuses to give up on the metaverse—even after Meta investors have, sending the company’s shares tumbling 20%”, *Fortune Magazine*, 27 October 2022, available at <https://fortune.com/2022/10/26/mark-zuckerberg-metaverse-earnings-investors-shares-tumble/>. Last accessed on 7 January 2023. ³⁹ M. M. Hasan, J. Popp, and J. Oláh, “Current landscape and influence of big data on finance”, *Journal of Big Data*, no. 7/21, pp. 1–17. ⁴⁰ C. Bröll, “Kontoeröffnung per Handy und kein Bargeld – Afrikas wichtigster Finanzplatz ist ein Labor für modernes Banking”, *Neue Zürcher Zeitung*, 5 February 2020, available at <https://www.nzz.ch/wirtschaft/suedafrika-ein-labor-fuer-modernes-banking-ld.1535428>. Last accessed on 4 January 2023. ⁴¹ S. Wachter, “The Theory of Artificial Immutability: Protecting Algorithmic Groups under Anti-Discrimination Law”, *Tulane Law Review*, XX (2022–2023), p. 1. ⁴² *Ibid.*, p. 10.

Correlation is not causation

An important mantra in statistics is *correlation is not causation*. Correlation measures if there is a statistical relationship between two random variables. For example, as most small children cannot read and have small feet, the data may find negative correlation between the variable X (small feet) and Y (ability to read). Likewise, you may find positive correlation in the data between the number of storks inhabiting a country and human babies being born. However, we all know storks do not in reality bring babies. It may just have to do with the fact that larger countries have more storks because there is more habitable land for them.⁴³ However, although there exist more elaborate statistical methods to measure qualitative relationships between variables—one example being regression analysis—algorithms may be constructed in such a manner that they support incorrect interpretations of the data.

Further, algorithms seek patterns in data. Hence, they often do injustice to the individual. This may also have negative economic effects: a person with a safe income living in a poor area may then be downgraded when applying for a loan for a profitable investment.



3.1 WHY FINANCE MATTERS: THE ERA OF FINANCE-LED CAPITALISM

Before we take a closer look at FinTech we must understand why finance is such a big factor in our economies: financialization has been the most important trend in the recent decades of economic globalization as financial flows became more unregulated.

“Financialization refers to the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy.”⁴⁴

Gerald A. Epstein, Professor of Economics and Co-Director of the Political Economy Research Institute at the University of Massachusetts, Amherst (USA)

Financialization describes different trends in economies such the dominance of stock markets and ‘shareholder value’ over the management of corporations. Others use it to describe the expansion of short-term capital flows where anonymous investors with less intimate knowledge of a firm or regional market and a tendency towards “herd behaviour” dominate bank-based financing of firms.

⁴³ A. Mayyasi, “Do Storks Deliver Babies?”, *Priceonomics*, 29 April 2014, available at <https://priceonomics.com/do-storks-deliver-babies/>. Last accessed on 4 January 2023. ⁴⁴ Gerald Epstein, “Financialization, Rentier Interests, and Central Bank Policy”, paper prepared for PERI Conference on Financialization of the World Economy (7–8 December 2001, University of Massachusetts), available at https://peri.umass.edu/fileadmin/pdf/financial/fin_Epstein.pdf. Last accessed on 4 January 2023.

HERD BEHAVIOUR

Herd behaviour in economics refers to the dynamics of capital markets where short-term financial investors tend to follow the crowd, which may trigger huge swings in financial flows and exaggerate boom and bust cycles in financial activity or, for example, a currency crisis.

The motive for that behaviour is that anonymous financial investors do not so much care about the economic fundamentals of an asset or a firm but rather its financial return. As they know that group dynamics, news, and psychology all drive asset prices they will move with the crowd and hence this results in a self-fulfilling prophecy. For example, when the real estate bubble burst during the global financial crisis of 2008, a lot of investors panicked and tried to immediately sell off their financial assets (*fire sales*) which led to an additional fall in the prices of those assets. As assets such as real estate served as collateral (security) for real estate loans and Anglo-Saxon conventions of accounting are based on current market prices (what a

buyer is currently willing to pay, rather than book value which is determined by original cost in acquiring the asset, adjusted for factors such as depreciation), the fall in asset prices in turn reinforced the credit crunch.⁴⁵

The British economist John Maynard Keynes offered a famous example for herd behaviour. In his “beauty contest” he described how readers of a newspaper would be invited to pick the most attractive faces from a hundred photographs. However, to win a prize, readers did not have to pick the face that they personally found the most attractive but rather to guess what most other readers would pick and hence make assumptions about the average opinion. Keynes used that example to describe herd behaviour and so-called bounded rationality on financial markets.⁴⁶

Financialization may also refer to the increasing political and economic power of a rentier class, according to its definition by the Marxist economist and German Minister of Finance during the Weimar Republic, Rudolf Hilferding, or also the growth of financial markets with a myriad of financial instruments, or the dominance of financial flows over trade flows (finance directing trade instead of financial flows financing trade).⁴⁷ It is also often used to describe the expansion of credit when measured against economic output (Gross Domestic Product or GDP).⁴⁸

The Post-Keynesian⁴⁹ economist Hyman P. Minsky developed a distinct theory labelled the *financial instability hypothesis*. Minsky’s theory starkly contrasted with the economic mainstream which mostly ignored money and banks (which were seen as a veil and not important to the production side of the economy; see also chapter 4 for the role of money in the economy).

Minsky argues that modern credit economies have a built-in tendency towards instability (“stability is destabilizing”) and require economic stabilization by the government. Accordingly, during periods of economic stability, banks, firms, and other economic agents become more reckless and optimistic about the future value of assets. They move towards Ponzi-style⁵⁰ behaviour where banks make loans to firms and households that can neither afford the interest nor the principal. Minsky was “rediscovered” during the global financial crisis of 2008, which was also often referred to as the “Minsky moment”.⁵¹

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⁴⁵ R. J. Shiller, “How a Bubble Stayed Under the Radar”, *New York Times*, 2 March 2008, available at <https://www.nytimes.com/2008/03/02/business/02view.html>. Last accessed on 4 January 2023. ⁴⁶ J. M. Keynes, *The General Theory of Employment, Interest and Money*, ch. 12, London: Macmillan, 1936. ⁴⁷ Gerald Epstein, *Financialization and the World Economy*, Cheltenham (UK): Edward Elgar Publishing, 2006, p. 3. ⁴⁸ T. I. Palley, “Financialization: What It Is and Why It Matters”, Levy Economics Institute, Working Paper no. 525, 2007, p. 7. ⁴⁹ The Post-Keynesian economic school of thought was founded by scholars who worked closely with the famous British economist John Maynard Keynes and tried to prevent his original ideas from being watered down by free market economists who integrated some of Keynes’s ideas into their models after the Great Depression. Post-Keynesians stress the inherent instability of capitalism, the role of fundamental uncertainty in business expectations, and the tendency of markets to produce unfavourable results such as unemployment without government intervention to stabilize consumption and investment demand. ⁵⁰ Charles Ponzi was an Italian con artist who emigrated to the United States and became famous in the 1920s for promising investors high returns for a business scheme where they would invest in postal reply coupons—coupons which were much cheaper in Europe than in the US. Ponzi attracted a consistent stream of fresh investment, which he used to directly pay out the “returns” he had promised to older investors: i.e. new investors essentially paying old. See also M. Zuckoff, *Ponzi’s Scheme: The True Story of a Financial Legend*, New York: Random House, 2006. ⁵¹ For a brief explainer regarding Minsky’s work see “Did Hyman Minsky find the secrets behind financial crashes?” *BBC*, 24 March 2014, available at <https://www.bbc.com/news/magazine-26680993>. Last accessed on 4 January 2023; or L. R. Wray, *Why Minsky Matters: Introduction to the Work of a Maverick Economist*, Princeton: Princeton University Press, 2015.

In sum, in financial capitalism, financial flows and the profit motives of short-term financial investors (shareholder value) increasingly steer economic activity and determine whether finance enables the drilling of oil, or building windmills, iPhones, or hospitals. Big Tech and Big Data companies are also eyeing financial markets because, whatever we do on the internet, in the end somebody wants to make money from it. Hence, the power of Big Data companies and platforms to affect economic activity and financial flows might shape our future.

3.2 WHAT IS FINTECH?

Our electronic financial infrastructure (such as used in card payments, etc.) creates a lot of data points and is hence very conducive to collecting Big Data. However, while financial technology (FinTech) works with Big Data, not all FinTech firms are Big Tech companies and not all Big Data companies are active in finance. A lot of startups exploit a particular market niche. For example, a country like South Africa became a laboratory for FinTech even before many Big Tech companies made a move into finance. South Africa presented an opportunity for FinTech because of the structure of the market. Racial segregation as a legacy of colonialism and the Apartheid era, the persistent inequality in income and wealth, as well as the dominance of minerals and mining led to a banking cartel that ignored customer needs and charged high fees for transactions.⁵³

FinTech proponents would argue that data technology would lower borrowing costs to households because risk assessment for financial service providers would be cheaper than for traditional banks.⁵⁴ However, a lower cost structure for corporations does not guarantee cheaper services for low-income households, as corporations may even simply make higher profits once market concentration kicks in and price competition fades away. Further, while digital banking is on the rise, many FinTech companies are just a veil or a layer which sits on top of the banking network,⁵⁵ with many of them even lacking a banking license. Hence, in some way or other FinTech is mostly embedded in Big Finance.



Sharks and Fishes or Predator-Prey Models in Economics

The financial instability hypothesis of Minsky is related to the so-called predator-prey models of the business cycle.⁵² Imagine an ocean with a lot of fish. The abundance of fish will contribute to the population of sharks increasing, which will diminish the population of fish until too many sharks are hunting too few fishes. Then the shark population will diminish until the fish population recovers. If you imagine financial rentiers as sharks and the fishes as the productive sector of the economy, you get an idea of the Minsky hypothesis.

“The most important financial innovation that I have seen the past 20 years is the automatic teller machine [ATM].”⁵⁶

Paul Volcker, former Chairman of the Federal Reserve Bank of the United States of America, speaking on financial innovations and the financial crisis of 2008

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⁵² Ó. Dejuán and D. Dejuán-Bitriá, “A predator-prey model to explain cycles in credit-led economies”, *Review of Keynesian Economics*, vol. 6, no. 2, pp. 159–79. ⁵³ C. Bröll, “Kontoeröffnung per Handy und kein Bargeld”. ⁵⁴ Julapa Jagtiani and Catharine Lemieux, “Fintech Lending: Financial Inclusion, Risk Pricing, and Alternative Information”, Federal Reserve Bank of Philadelphia Working Paper no. 17, 2017, p. 2. ⁵⁵ B. Scott, *Cloudmoney: Cash, Cards, Crypto and the War for our Wallets*, London: Penguin, 2022, pp. 138–44. ⁵⁶ J. Shepherd-Barron, “Meet the true star of financial innovation – The humble ATM”, *Financial Times*, 22 June 2017, available at <https://www.ft.com/content/052f9310-5738-11e7-80b6-9bfa4c1f83d2>. Last accessed on 4 January 2023.

WHAT IS FINTECH?

FinTech means a lot of different things, such as the use of data technology in *payments* (business to business and business to customers), *insurtech* (using data and technology such as apps to attract customers and then usually to pass them on to traditional insurers), *RegTech* (using data and technology to automatize compliance with government regulations), *WealthTech* (which entails digital wealth management through *RoboAdvisor* platforms as well as neobrokers for mass market stock trading), blockchain and crypto assets, as well as cybersecurity in finance.⁵⁷ FinTech platforms are usually capitalized and leveraged by venture capitalists and private equity firms to reach scale.⁵⁸

This publication focuses entirely on FinTech companies which provide payment systems such as digital banking and mobile payment, as those are the most important in Africa.

Many FinTech companies brand themselves with the promise to “disrupt” the old and sluggish banks with their manifold problems, such as the financial exclusion of poor people, high fees, or poor service and accessibility. However, most FinTech companies plug into the banking network the same way that a gym training app on an iPhone plugs into the Apple iOS operating system.⁵⁹

In fact, banks themselves tried for many years to cut labour and infrastructure costs—such as staff and bank branches—by transferring the branch into our homes. In 1958 Barclays Bank even ran an advert with the title “No Robots at the Counter” to address people’s unease with technological progress through the automatization of bank processes.⁶⁰

Early attempts to reduce the need to visit a physical branch included phone banking and payment cards. In the 1980s, banks experimented with home banking until online banking emerged in the 1990s. However, banks had multiple tasks and less capacity to focus entirely on technological innovation. In the end, Silicon Valley with its army of engineers and the ever-greater technological capacities of computer chips was needed to truly bring banking into our homes.⁶¹ The current generation of smartphones has more computer power than the technology used to bring the first men to the moon⁶² and hence more of our social and economic activities will merge into that “black mirror”.

“Fintechs, on average, do not *bypass* the existing financial system but plug into it. They use the ecosystem ... controlled by major banks and payment firms like Visa as a substrate upon which to build their budgeting tools, saving platforms and so on. PayPal was one of the original examples of this – it started with big claims about disrupting finance, but in the end proved to simply be a ‘plug-in’ money transmitter attached to bank accounts.”⁶³

Brett Scott, former broker, monetary anthropologist, and author of *Cloudmoney: Cash, Cards, Crypto and the War for Our Wallets*

Research shows that people spend up to 100 percent more when they use electronic forms of payment such as credit cards (as they do not see the money physically vanishing from their wallet).⁶⁴ Hence, caution is advised when the FinTech industry claims that the primary purpose behind digitalizing finance and going cashless is to ‘lift people up’ i.e. to improve their financial circumstances. To the contrary, going entirely cashless also poses great risks such as electronic meltdowns or poor access to digital services. If people in ‘unprofitable’ rural areas lose access to digital infrastructure, they could also lose the ability to conduct financial transactions if there is no longer the option to use cash.

⁵⁷ KPMG, *Pulse of Fintech: H2'21*, January 2022, p. 13, available at <https://assets.kpmg/content/dam/kpmg/xx/pdf/2022/02/pulse-of-fintech-h2-21.pdf>. Last accessed on 4 January 2023. ⁵⁸ P. Langley and A. Leyshon, “Neocolonial credit: FinTech platforms in Africa”, *Journal of Cultural Economy*, vol. 15, no. 4, p. 403. ⁵⁹ B. Scott, *Cloudmoney*, p. 141. ⁶⁰ *Ibid.*, p. 137. ⁶¹ *Ibid.*, pp. 139–40. ⁶² M. Rosoff, “Your Phone Is More Powerful Than The Computer In The Spaceship NASA Launched This Week”, *Business Insider*, 6 December 2014, <https://www.businessinsider.com/your-phone-is-more-powerful-than-the-orion-computer-2014-12>. Last accessed on 4 January 2023. ⁶³ B. Scott, *Cloudmoney*, pp. 141–42. ⁶⁴ B. Hardekopf, “Do People Really Spend More With Credit Cards?” *Forbes*, 16 July 2018, <https://www.forbes.com/sites/billhardekopf/2018/07/16/do-people-really-spend-more-with-credit-cards/?sh=102c03641c19>. Last accessed on 4 January 2023.

Corporations must navigate a contradiction. They seek to expand consumer demand for their goods and services while keeping wages low to boost their profits. Financial inclusion and the cashless society is a way to soften that contradiction by pushing poor people into debt.

For example, the experiment by the government of India to drive cash and so-called “black money” out of the economy led to a disastrous economic collapse in rural areas when people lost overnight their ability to buy essential goods.⁶⁵ Further, while fighting money laundering, corruption, or tax theft is justified and necessary, authorities may also seize electronic data from financial service providers for repressive purposes such as targeting donors to critical non-governmental organizations (NGOs). Going fully cashless may result in a financial system with a few big digital players and hence increased vulnerability to fees or financial exclusion (but this time without a cash alternative).

The industry would often claim that people want to go cashless because it is convenient. And indeed the often poor payment infrastructure in rural Africa lends credence to that statement. However, technology is often driven by corporate profit and then sold to the public as being something that people genuinely want or need. For example, we once managed our lives without mobile phones. It is true that once everybody has a mobile phone, a Facebook account, or you can only pay by card or other digital means, network effects kick in and social and economic participation depends on technology. If for example physical bank locations get shut down, online banking is often the only alternative. This is not to say that technology does not make our lives easier. However, deciding which technology is applied to which purpose should not be entirely left to profit-seeking entities. In the same way that societies debate their “energy mix” in light of the climate crisis and might prefer clean energy over coal mines, the public should engage with the design of its payment infrastructure and the right “financial mix”. FinTech firms are not charitable organizations that merely want to improve our payment experience. For instance, think about older people who struggle to navigate new technologies, or poor people without reliable access to digital infrastructure who might need to safeguard physical cash.⁶⁶

Did fast food companies and Uber Eats make our workdays less stressful since we do not need to cook at home, or do we often simply work longer and eat less healthily? Did emails reduce the time we spend writing letters or are we communicating even more than ever, with our communication indeed sometimes being less focused and more random? Technology may have a lot of benefits but the way our society uses and governs technology makes a difference. In a capitalist economy a lot of those decisions are left to private enterprise.

While it seems futile to resist technological progress since efficiency gains may free up economic resources to improve society, the outcome depends crucially on who controls the economic gains and whether a society, or powerful corporate players, decide how to put technology to use.

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⁶⁵ Agence France-Presse in Delhi, “Narendra Modi pledges to ease India’s cash crisis”, *The Guardian*, 14 November 2016, available at <https://www.theguardian.com/world/2016/nov/14/narendra-modi-pledges-to-ease-india-cash-crisis>. Last accessed on 4 January 2023. ⁶⁶ B. Scott, *Cloudmoney*, pp. 3–6.

3.3 THE ROLE OF BIG TECH IN FINANCE

While a lot of FinTech companies are not Big Tech companies, they are still plugged into the money circuit of Big Finance. For instance, a specialized FinTech firm such as Jumo which operates in South Africa is not a Big Tech company like Apple, as it does not provide all kinds of technology-related services linked to the use of data. However, it does analyse Big Data sets for big banks and telecommunication firms and offers financial products such as loans in partnership with them.

Most technological booms eventually lead to market concentration as nascent startup firms often lack the resources to survive economic downturns and fierce price competition. Hence, it can be expected that Big Tech companies will in future try to swallow successful FinTech firms, leading to Big Tech also marrying Big Finance.

Nearly a third of the population in developing countries and 1.4 billion people globally do not have a bank account due to a lack of regular income, high fees, and/or informal social status (i.e. no formal employment contract, formal housing, or residency permit). However, some of those people potentially use social media accounts that are, on the surface at least, free of charge.⁶⁷ Hence, the potential for a company such as Meta (Facebook) to become a big shadow bank outside the remit of banking regulation, potentially with the power to create credit and create capital flight across borders, led major central banks to oppose the plans for fear of undermining the exclusive remit of states to issue sovereign currency.⁶⁸

Facebook initially had planned to issue a stablecoin⁶⁹ named Libra, pegged to a basket of currencies (mainly for purchasing goods and services within the Facebook ecosystem but also to exchange those coins for regular currency) and in partnership with Visa and Mastercard. Hence, unilaterally changing the composition of the basket (for example by raising the share of weaker currencies) could have effectively meant creating credit. Libra also became the catalyst for the debate on central bank digital currency (CBDC, see chapter 7)⁷⁰ and provoked fierce resistance from regulators and major central banks.⁷¹

Meta Platforms, Inc. (originally Facebook) is reported to have roughly 2.9 billion monthly users, well above one third of the global population.⁷²

While Facebook's plans did not materialize, Big Tech companies have already become active players in finance: there is Amazon Pay, Apple partnering with Goldman Sachs to issue a credit card, or Google issuing checking accounts with partners from the banking industry. Facebook did subsequently also attempt to launch Diem, a pared-back stablecoin which evolved out of the failed Libra project (and that was no longer linked to a basket of currencies), although this venture was also ultimately unsuccessful.⁷³ Most of these offers are however still concentrated in the core markets of the industrialized economies with a robust middle class.

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⁶⁷ That certainly is an illusion, because if a commercial product is provided free of charge, then probably you, the user, are the product. Facebook monetizes personal data through advertisement and other means. ⁶⁸ R. Browne, "Facebook's cryptocurrency faced with regulatory warnings from global central bankers", *CNBC*, 20 June 2019, available at <https://www.cnn.com/2019/06/20/facebook-libra-cryptocurrency-faced-with-central-bank-warnings.html>. Last accessed on 4 January 2023. ⁶⁹ A stablecoin is a payment token pegged against a currency such as the US dollar. In the case of Libra, later relaunched under the name Diem, Facebook promised to redeem one coin (or token) for the equivalent amount of dollars. ⁷⁰ D. Niepelt, "Libra paves the way for central bank digital currency", *Centre for Economic Policy Research*, 12 September 2019, available at <https://cepr.org/voxeu/columns/libra-paves-way-central-bank-digital-currency>. Last accessed on 4 January 2023. ⁷¹ Elizabeth Dwoskin and Gerrit De Vynck, "Facebook's cryptocurrency failure came after internal conflict and regulatory pushback", *Washington Post*, 28 January 2022, available at <https://www.washingtonpost.com/technology/2022/01/28/facebook-cryptocurrency-diem/>. Last accessed on 4 January 2023. ⁷² Simon Kemp, "Essential Facebook statistics and trends for 2022", *DataReportal*, updated 15 August 2022, available at <https://datareportal.com/essential-facebook-stats>. Last accessed on 4 January 2023. ⁷³ Meta announced the sale of the business to Silvergate after meeting resistance from US regulators, see H. Klaiber, "Meta: Kryptowährung Diem ist nun offiziell Geschichte", *t3n: digital pioneers*, 1 February 2022, available at <https://t3n.de/news/meta-kryptowaehrung-diem-1447940/>. Last accessed on 4 January 2023.

BIG BROTHER—DIGITAL FINANCE IN CHINA

In China, Ant Group (formerly known as Ant Financial, an affiliate company of the giant tech conglomerate Alibaba Group) counts over 700 million people as customers. When those customers order a pizza, it feeds into their algorithm. Ant Group uses behavioural finance and artificial intelligence to calculate credit default risk or make loan-granting decisions.⁷⁴

China also established a social scoring system⁷⁵ where behaviour that is considered undesirable by the authorities may lead to financial downgrading and hence social exclusion, similar to a concept explored in the episode “Nosedive” of the British TV series *Black Mirror*. The series portrays, via a science fiction lens, the degradation of human relationships through technology.

Cash has been widely scaled back in the urban centres of China, providing billions of electronic data trails every day to corporations and state authorities. Donations to homeless people can be made via QR Codes, and facial recognition is already widely in use in banking.⁷⁶

A study by the Bank for International Settlements (BIS) finds that FinTech and Big Tech platforms expanded their lending around the world prior to the pandemic. The BIS estimates that the flow of FinTech credit reached USD 223 billion and that of Big Tech platforms USD 572 billion in 2019. While China, the United States, and the United Kingdom are the largest markets for FinTech credit, Big Tech credit is also growing fast in China, Japan, South Korea, Southeast Asia, and some countries in Africa and Latin America.⁷⁷

Generally, such lending is more developed in countries with higher GDP per capita (however this is becoming less the case), where banking sector profits are higher, and where banking regulation is more lenient. According to the BIS, FinTech credit is more prevalent where there are fewer bank branches per capita. The BIS further quotes factors such as a business-friendly regulatory environment and supportive judicial systems (i.e. for banks claiming collateral from those who cannot pay off loans) as well as a low bank credit-to-deposit ratio as factors enabling FinTech and Big Tech to flourish. However, the research suggests that these alternative forms of credit seem to complement traditional forms of credit rather than acting as a replacement for them.⁷⁸

“With Apple Card, we completely reinvented the credit card. Your information lives on your iPhone, beautifully laid out and easy to understand. We eliminated fees and built tools to help you pay less interest, and you can apply in minutes to see if you are approved with no impact to your credit score. Advanced technologies like Face ID, Touch ID, and Apple Pay give you a new level of privacy and security. ... Apple Card. It’s everything a credit card should be.”⁷⁹

From the Apple advertisement:
“The simplicity of Apple. In a credit card.”

74 R. Mak, “Ant may find it easy to move on after breakup”, *Reuters*, 14 September 2021, available at <https://www.reuters.com/breakingviews/ant-may-find-it-easy-move-after-breakup-2021-09-14/>. Last accessed on 4 January 2023. 75 “China’s Social Credit System”, *Bertelsmann Stiftung*, 2022, available at https://www.bertelsmann-stiftung.de/fileadmin/files/aam/Asia-Book_A_03_China_Social_Credit_System.pdf. Last accessed on 4 January 2023. 76 Yen Nee Lee, “Forget the QR code. Facial recognition could be the next big thing for payments in China”, *CNBC*, 19 November 2019, available at <https://www.cnn.com/2019/11/19/tencents-wechat-china-may-soon-use-facial-recognition-for-payments.html>. Last accessed on 4 January 2023. 77 G. Cornelli, J. Frost, L. Gambacorta, R. Rau, R. Wardrop, and T. Ziegler, “Fintech and big tech credit: a new database”, Bank for International Settlements Working Paper no. 887, 2020, pp. 1–35, available at <https://www.bis.org/publ/work887.pdf>. Last accessed on 4 January 2023. 78 Ibid. 79 The Apple advertisement contains no fewer than 17 footnotes including disclaimers such as “accepting an Apple Card after your application is approved will result in a hard inquiry, which may impact your credit score” or “Apple Card Family Co-Owners will have full visibility into each other’s account activity, and Owners will have visibility into all Participant account activity”, as well as “late or missed payments will result in additional interest accumulating toward your balance”; see “The simplicity of Apple. In a credit card”, *Apple*, 2022, available at <https://www.apple.com/apple-card/>. Last accessed on 4 January 2023.

However, Big Tech companies increasingly try to challenge banks directly. For example, Apple is entering the “buy now pay later” (BNPL) customer loan market (where customers can purchase a product but pay for it later without interest). It does so without a banking partner, simply securing loans via its huge balance sheet.⁸⁰ Big Tech companies thus become shadow banks and start to issue loans without a lender of last resort⁸¹ (a central bank) that may step in during times of crisis, and without proper financial supervision. However, the risk to financial stability from these loans in the consumer goods market is limited. As loans are mostly not collateralized (such as in the mortgage market where for example borrowers pledge their homes) there is less risk of financial contagion (for example a credit crunch as in the financial crisis of 2008 when depressed house prices further diminished bank capital). However, it may be an attempt by Big Tech companies to test the water and expand their banking business based on the data they collect via BNPL.

“Apple is making its biggest move into finance by offering loans directly to consumers for its new buy now, pay later product ... Big Tech’s move into the core banking business has been long feared on Wall Street after years of an uneasy alliance in areas such as mobile payments. ... Buyers of Apple’s premium-priced gadgets tend to have higher incomes than other tech customers, making them less of a lending risk.”⁸²

Financial Times, “Apple sidelines Goldman Sachs and goes in-house for lending service”

The Apple iPhone with its apps and data flow helps to gather financial information such as purchasing power, spending patterns, or the risk of credit default.⁸³ BNPL is not new to the consumer goods market. It is a common tool to entice customers (especially from low-income households) to spend more than they would otherwise be able to afford. BNPL firms usually earn a transaction fee from the company that sells its product to the customer, and also on late payment fees from the customer. While consumer credit and electronic payment via credit cards generally aims at shifting the budget constraints of private households, BNPL is often applied to customers with poor credit ratings and with corresponding credit limits by card issuers.⁸⁴ By contrast, Apple targets the tech-savvy middle

class in industrialized and emerging economies. However, the fact that Apple is adopting this model indicates the potential for profit that could emerge for Big Tech companies in African countries with a meaningful middle class and an accompanying high consumer demand.

Reasons for using BNPL/Percentage of people who use it for this reason

Purchase that is out of budget	44.98%
Avoid interest on consumer credit	36.92%
Borrow money without credit check	24.73%
Avoid sharing personal data	20.79%
Alternative to a credit card	19.18%
Maxed out credit card	17.2%
Can’t get approved for a credit card	14.16%
No bank account	7.71%
Other	5.73%

<https://www.bankrate.com/loans/personal-loans/buy-now-pay-later-statistics/>
Source: Bankrate/C+R Research⁸⁵ https://www.crresearch.com/blog/buy_now_pay_later_statistics

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⁸⁰ T. Bradshaw, S. Venkataramakrishnan, I. Moise, J. Franklin, and G. Silverman, “Apple sidelines Goldman Sachs and goes in-house for lending service”, *Financial Times*, 9 June 2022, available at <https://www.ft.com/content/fc4eeb5c-479a-4daf-9f8b-808ee937530f>. Last accessed on 4 January 2023. ⁸¹ In periods of financial turmoil, when banks may have doubts about lending to each other and lots of people may suddenly want to withdraw their money from their bank accounts, they need a lender of last resort, i.e. the central bank, as it can provide credit at its own discretion against collateral as it is the creator of currency. For further discussion of the evolution of central banks from being lenders of last resort to providing deals of last resort see P. Mehrling, *New Lombard Street: How the Fed Became the Dealer of Last Resort*, Princeton: Princeton University Press, 2010. ⁸² Bradshaw et al., “Apple sidelines Goldman Sachs”. ⁸³ Ibid. ⁸⁴ R. Haughn, “2022 Buy now, pay later statistics”, *Bankrate*, 8 July 2022, available at <https://www.bankrate.com/loans/personal-loans/buy-now-pay-later-statistics/>. Last accessed on 4 January 2023.

4 THE MONETARY SYSTEM AND FINTECH

This chapter will take a closer look at our monetary system, which is crucial to evaluate whether FinTech contributes to economic betterment. If you are well acquainted with the way in which central banks operate and how money is created, feel free to skip this section.

Different economic schools of thought disagree on whether money is just a “veil” on the economy and therefore a neutral force when it comes to economic production. If one agrees with the neutrality of money then we could stop here and stop worrying about banks, FinTech, and everything else, as those firms just ensure that everybody can make smooth economic transactions. This is however not the view held in this study and it is also not (anymore) the view advanced by major central banks. This study argues that money in essence is credit and that it is the driving force behind investment and capital accumulation (besides profits earned which may be reinvested).

Classical economists assumed money to be just a “veil” upon production without having any effect on real economic output.⁸⁶

That view has died a slow death since the last financial crisis where money played an obvious role and even some of the most conservative central banks such as the German Bundesbank do not entertain that view.⁸⁷

Credit is key to investment and growth. Deeper credit markets, for example those with a high percentage of domestic bank credit in relation to GDP, will positively affect credit and hence investment⁸⁸ as opposed to depending on volatile short term capital flows from foreign investors.

“In the United Kingdom, money is endogenous – the Bank supplies base money on demand at its prevailing interest rate, and broad money⁸⁹ is created by the banking system.”⁹⁰

Mervyn King, former Executive Director of the Bank of England

In some economic textbooks or the business section of newspapers it is sometimes argued that central banks cause inflation by printing “too much money”. However, more credit or money does not necessarily raise inflation. If more money circulates in the economy, it may either finance additional consumption (i.e. consumer debt) which is inflationary, or finance additional productive capacity of the economy (when the economy is producing below capacity with high unemployment as in most low-income countries).

Further, most money is not printed but represents mere figures on bank accounts or digital devices. It is created mostly by commercial banks, and central banks do not directly control the money supply as it depends on the credit demand of private households and firms at the given interest rate. The money that is created by the central banks does not circulate in the economy but between commercial banks. It is however true that low interest rates may support higher asset prices: credit may boost demand for scarce assets such as raw materials, food, or real estate which cannot be easily reproduced in the same way that industrial goods can. This may spill over into higher inflation rates through increases in the cost of living. However, the question then is not how much credit is created but rather to which sectors of the economy credit is directed.

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⁸⁵ C+R Research surveyed 2,005 self-reporting online consumers via Amazon’s Mechanical Turk (MTurk) survey platform in 2021. 51% were male and 49% were female with an average age of 37. Income—under \$20K: 14%; \$20-40K: 26%; \$40-60K: 25%; \$60-80K: 18%; \$80-100K: 8%; over \$100K: 9%. Employment status—full-time: 72%; part-time: 13%; unemployed due to COVID-19: 2%; unemployed not due to COVID-19: 7%; other: 6%; see “Buy Now, Pay Later Statistics and User Habits”, C+R Research, 2021, available at https://www.crrresearch.com/blog/buy_now_pay_later_statistics. Last accessed on 4 January 2023. ⁸⁶ For more on this concept, see D. Patinkin and O. Steiger, “In Search of the ‘Veil of Money’ and the ‘Neutrality of Money’: A Note on the Origin of Terms”, *The Scandinavian Journal of Economics*, vol. 91, no. 1, available at <https://www.jstor.org/stable/3440167>. Last accessed on 12 January 2023. ⁸⁷ “Häufig gestellte Fragen zum Thema Geldschöpfung”, Deutsche Bundesbank, available at <https://www.bundesbank.de/resource/blob/614528/ca4942c86c4f86881309fac3942c3f0a/mL/haeufig-gestellte-fragen-geldschoepfung-data.pdf>. Last accessed 14 February 2023. ⁸⁸ H. J. Herr, “Credit expansion and development: A Schumpeterian and Keynesian view of the Chinese miracle”, *European Journal of Economics and Economic Policies: Intervention*, vol. 7, pp. 71–89. ⁸⁹ Broad money is the broadest definition of money supply, comprising both narrow money i.e. notes and coins, and also any other liquid assets that can be used to make purchases. ⁹⁰ M. King, “The transmission mechanism of monetary policy”, *Bank of England Quarterly Bulletin*, no. 3, 1994, p. 264, available at <https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/1994/the-transmission-mechanism-of-monetary-policy.pdf>. Last accessed on 4 January 2023.

“Money is not metal. It is trust inscribed.
And it does not seem to matter much where it
is inscribed: on silver, on clay, on paper,
on a liquid crystal display.”⁹²

Niall Ferguson, Professor of Economic History and Senior Fellow at the Hoover Institution, Stanford University

4.1 WHERE DOES MONEY COME FROM?

If an entrepreneur demands a loan of EUR 100,000 for investment purposes, at a commercial bank at a given interest rate, the bank might agree to the loan. Loan decisions might depend on the entrepreneur’s collateral and whether they made enough profit in the past, and hence that they are trusted to be able to service the debt at that level of interest. The bank then will enable the entrepreneur to draw upon EUR 100,000 in their account just by entering those numbers into a computer. The money has been created out of thin air (so called fiat money, not tied to a certain quantity of gold or anything else) without relying on anybody’s deposits. Instead, the loan created the deposit in the entrepreneur’s account. Once the loan has been repaid to the bank via future profits (including interest payments), the money is returned to non-existence.⁹¹

Commercial banks create more credit than they have physical cash deposits, and they also do not need people to deposit their savings before the bank can lend money. Mainstream economic theory wants us to believe that private households must save or workers have to accept lower wages (enabling higher profits) to kick-start investment. While this may be true for a very basic barter economy, it is not true for a modern monetary economy with deep credit markets.

Imagine a simple barter economy where all agricultural output is consumed and hence no savings exist. If we now add credit into the picture and the farmers take on loans so that they can devote time to inventing improved tools, credit may kick-start production leading to more food production in the next period which would then allow for higher income and hence savings. It is therefore not savings which finance investment but rather investment which creates savings. That is why money creation may be important to foster economic betterment in low-income countries.

4.2 WHAT KIND OF MONEY?

We have not even yet discussed a very simple question: what is money? Is it M0, M1, M2, or M3 (or sometimes M4), these being different and often confusing monetary definitions used by central banks?⁹³ Is it the numbers on computers created by commercial banks? Is it the cash we withdraw from an ATM? Is it the balances held by commercial banks in the accounts they hold with a central bank? And does a Kenyan shilling held in an M-Pesa account count as money?

If you pawn your watch, it is a highly liquid asset as you will receive money for it. Imagine other people started to pay with watches because the recipients knew they could at any time redeem the watch for cash at a pawnbroker’s. A watch could hence be defined as “near-money”.⁹⁴ Along the same line of reasoning, central banks use different definitions for diverse money types (the often mysterious M0 to M4 monetary aggregates you sometimes find in business magazines or economic textbooks) according to their “moneyness”. Hence, these categories serve to distinguish more narrow definitions of money such as coins and paper money, the digital money balances commercial banks hold in their accounts at the central bank (central bank reserves), or the money in our accounts at commercial banks (bank money) from broader types of money such as marketable securities and very liquid assets. Definitions of money will thus always be a bit arbitrary.

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⁹¹ S. Faure and H. Gersbach, “On the money creation approach to banking”, *Annals of Finance*, vol. 17, pp. 265–318. ⁹² N. Ferguson, *The Ascent of Money: A Financial History of the World*, 2nd ed., London: Penguin, 2008, p. 28. ⁹³ As these terms are various, often confounding, and defined differently in different regions, explanations may only be of limited use. However, for one perspective on how these terms can be defined, see for example “M1, M2 and M3”, *ClearCapital*, available at <https://www.clearcapital.com/resources/glossary-of-terms/m1-m2-and-m3>. ⁹⁴ J. Ryan-Collins, T. Greenham, R. Werner, and A. Jackson, *Where Does Money Come From? A Guide to the UK Monetary and Banking System*, 2nd ed., London: New Economics Foundation, 2012, p. 59, available at https://neweconomics.org/uploads/files/b847162e8c996d5e26_fam6bqdx4.pdf. Last accessed on 4 January 2023.

So instead of introducing all the different monetary aggregates used by central banks (which may differ between central banks in different countries) let us briefly categorize the most important forms of money to understand how they affect or do not affect the real economy.

Cash (central bank or first-tier money)

The smallest fraction of our money is *cash* (paper or sometimes plastic notes, metal coins). In some monetary systems, notes are issued by the central bank and coins by the treasury. In South Africa, the South African Reserve Bank has the sole authority to issue both.⁹⁵ In the United Kingdom less than three percent of the standard definition of the broadest money supply aggregate (which is called M4 in the UK) is cash.⁹⁶ Most payments for larger sums are however conducted electronically.

Central bank reserves (central bank or first-tier money)

Further, the central bank can directly create electronic money (also called central bank reserves) by crediting the accounts at the central bank held by commercial banks and the government via an overdraft facility.

If the state wants to build a road and pay a construction company, the central bank could just credit the account of the construction company held at the central bank and debit the account of the treasury. It only needs to push a button and write the amount into an electronic database, thereby creating money out of thin air.

Another way for a central bank to create those central bank reserves (and hence deposits in accounts) is through the purchase of assets (such as government bonds or shares) from commercial banks (and in some cases even directly from the government) or when paying central bank employees their salaries (in some countries central bank staff are allowed to have accounts at the central bank instead of at a commercial bank).⁹⁷

These first two types of money—cash and central bank reserves—are both considered *central bank money* and hence 100 percent safe, as the central bank can never run out of its own currency. It is the legal unit of payment within the borders of that country or currency union⁹⁸ and the central bank can just create it by pressing a button (which however does not mean that there should be no limits placed upon this).

Cash circulates in the “real economy” as we may withdraw cash from an ATM and use it to make payments. Central bank staff may also use their salaries in the form of deposits for payments. If they were to use accounts at the central bank to make payments, such as paying rent to their landlord, that digital central bank money would just shift between their bank account and the account of the landlord’s bank at the central bank. The same holds true for payments by the treasury from its account at the central bank to the accounts of commercial banks (i.e. paying the salaries of government officials into their accounts at a commercial bank). For all these transactions, money is just shifted between the accounts of the commercial banks or that of the treasury at the central bank.

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⁹⁵ “Banknotes and Coin”, *South African Reserve Bank*, 2022, available at <https://www.resbank.co.za/en/home/what-we-do/banknotes-and-coin>. Last accessed on 4 January 2023. ⁹⁶ Ryan-Collins et al., *Where Does Money Come From?*, p. 14–15. ⁹⁷ *Ibid.*, p. 14. ⁹⁸ Cash certainly can lose value due to inflation. In cases of hyperinflation, central banks do sometimes dollarize their economy (peg their currency to the global leading currency, the US dollar) or conduct other reforms to counter inflation, which can lead to older iterations of cash being taken out of circulation.

When a state employee receives their salary into their bank account at a commercial bank, the account of their commercial bank at the central bank is credited and the account of the treasury at the central bank is debited. However, the account balance at the central bank—shifted from the account of the treasury to the account of the commercial bank—is not the same money as the money in the employee’s personal account at the commercial bank. Hence, central bank reserves are not used for payment (or lending) outside of the banking system. Reserves are just shifted around between the bank accounts of the commercial banks held at the central bank (the interbank market).⁹⁹

Banks do not need reserves at the central bank before lending or before increasing the deposits held by state employees in their private accounts. The central bank creates the reserves the banks need in response to those transactions. Hence, it is not reserves that create deposits but deposits that create reserves.¹⁰⁰

Bank money (second-tier money)

Commercial banks in turn create money by issuing credit out of thin air, as explained in chapter 4.1. This electronic or second-tier money created by commercial banks circulates in the real economy and makes up the bulk of the money used for our daily transactions.

In sum, there are three types of money: cash, reserves, and bank money. The first two are central bank money and only the first and the third circulate in the real economy.

BANK-CHIP-SOCIETY

In other words: imagine you withdraw cash (central bank money). Next, you walk into a casino and exchange a hundred units of your currency for a hundred casino chips, which you then use to play roulette or other games at the casino. At the end of the evening you turn in your remaining chips and you cash out again. Basically, our monetary system with banks works just like those casino chips. The central banks create legal tender which you can withdraw as cash. However, most of the money in use in real life is just numbers on computers created by banks, much the same as how those casinos issue chips.

Now imagine the casinos were even free to issue more chips than you have actually paid for in cash. This is what banks do. If we were all to try to redeem our chips at the same time or to withdraw all our account balances in cash from the ATM, banks would crumble as they do not have sufficient cash in their vaults. Those imaginary casinos also have bank accounts with the central bank where they move money around, but this money does not enter the casino economy (with us being the players at the tables). Hence most of our money is nothing more than bank “chips”. Brett Scott therefore calls our monetary system a “bank-chip society” where cash is the only money guaranteed by the central bank (although many countries have deposit insurance schemes which insure customer deposits up to a certain amount).¹⁰¹

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⁹⁹ Theoretically, wealthy households could acquire government bonds and deposit them with their commercial bank. The commercial bank could in turn deposit the bonds with the central bank to obtain reserves. Hence, reserves would grow in step with government bond issuance or government spending into the economy. However, even in that case it is not the central bank that creates the money supply, but it is the households that demand government bonds. ¹⁰⁰ Y. Nishiyama, “The endogenous money supply revisited in a more realistic institutional framework”, *Journal of Post Keynesian Economics*, vol. 36, no. 4, pp. 653–72. ¹⁰¹ B. Scott, *Cloudmoney*, pp. 83–109.

4.3 WHERE DOES FINTECH FIT INTO THE MONETARY SYSTEM?

If central bank money (the reserves held by banks in their accounts at the central bank, as well as cash) is first-tier money and bank money is second-tier money (money issued by commercial banks without a state guarantee) then most FinTech enterprises which accept bank money and then shift their own “casino chips” from A to B are just dealing third-tier money.

Let us look at the example of PayPal, which is one of the most successful FinTech companies in the world and contributed enormously to the wealth of South African-born billionaire Elon Musk.

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¹⁰² “We get where you’re coming from”, *PayPal*, 2022, available at <https://www.paypal.com/us/webapps/mpp/country-worldwide>. Last accessed on 4 January 2023. ¹⁰³ D. Pereira, “PayPal Business Model”, *Business Model Analyst*, 17 July 2022, available at <https://businessmodelanalyst.com/paypal-business-model/>. Last accessed on 4 January 2023. ¹⁰⁴ E. Witman, “Can you use PayPal without a card?: Yes, you can — here are 6 things you can do on PayPal without a linked debit or credit card”, *Business Insider*, 27 December 2019, available at <https://www.businessinsider.com/guides/tech/can-you-use-paypal-without-a-card#have-your-paypal-balance-sent-to-you-as-a-check-with-a-150-fee-7>. Last accessed on 4 January 2023. ¹⁰⁵ B. Scott, *Cloudmoney*, p. 109. ¹⁰⁶ D. Pereira, “PayPal Business Model”.

PAYPAL

PayPal was launched in 1999 as a money transfer system from the US software company Confinity, and currently has over 420 million customers in over 200 countries, and supports 25 currencies.¹⁰² Confinity merged with X.com, a competitor founded by Elon Musk, allowing it to dominate the market. Changing the company name to PayPal, it then went public in 2002 and was acquired by the online marketplace eBay (initially 60 percent of PayPal transactions were linked to eBay),¹⁰³ before being spun off into a separate company again in 2015.

PayPal is a FinTech company and is a two-way platform with merchants on one side, which use PayPal services to receive payments, and consumers on the other, who make payments either to the merchants or other individuals. As sending money overseas via the banking system was often a lengthy process with heavy fees, PayPal allowed the transactions to be done more simply and cheaply.

PayPal’s original innovation was using the US dollar as exchange currency and the email as a transfer medium. Customers could just open an account online, and either deposit money via a retail store or link it to a bank account or credit card. People could receive money via PayPal with or without a bank account. In the latter case, they could store

the money for later use, for example on eBay, send the PayPal balance to merchants or customers (and hence conduct payments without a bank account), or withdraw through use of an emailed check, for a fee.¹⁰⁴ PayPal automatized customer fraud detection by sharing data with over 600 institutions, from banks, card networks, and credit reference and fraud agencies, to commercial partners such as eBay.¹⁰⁵

PayPal makes its money primarily through transaction fees for merchants and on international payments, business account fees, a fixed fee on borrowing working capital (a certain percentage taken from sales from the last 12 months), investments of deposits in liquid assets and interest earned, withdrawal fees, and credit interest, as well as through monetization of data.¹⁰⁶

In sum, PayPal used internet technology and Big Data to make payments faster, cheaper, and easier across borders. However, it did not “disrupt” finance by inventing “new money”. Their main business is based on shifting second-tier bank money around—although they have also started issuing small business loans.

“Groups like PayPal, however, can subsequently take your bank chips, and issue you PayPal chips instead. ‘Dollars’ in your PayPal account are third-tier chips that promise you second-tier bank chips that promise you first-tier US government dollars issued by the Fed. PayPal chips get called ‘dollars’ because their issuer promises to redeem them for ‘higher-powered’ dollar lower down the chain.”

Brett Scott, former broker, monetary anthropologist, and author of *Cloudmoney: Cash, Cards, Crypto and the War for Our Wallets*

Why does it matter if FinTech firms create or shift “money chips” around? It matters because a fundamental argument for financial inclusion is that it lifts people out of poverty and spurs economic development. However, as we have seen in the previous sections, if money is just a medium of exchange for barter it no longer has any impact on real production. If, on the other hand, money is credit and is used to kick-start the economy, much of FinTech has nothing to do with it.

However, sometimes (and one might argue, increasingly) FinTech will create new chips if the FinTech company in question has a banking license, is allowed to lend from its own balance sheet, or partners with a bank in order to issue loans. Hence, a lot of FinTech companies will want to use their data power to combine this with the extraordinary privilege that banks have to create money. Once we acknowledge that banks that become too big and too interconnected pose great dangers to financial stability and society at large, then we should also worry about Big Data meeting Big Finance. We will look at this issue in chapter 5 and examine whether FinTech in Africa is simply shifting chips or is itself issuing chips, and whether it does so to kick-start investment via credit or merely to compensate for low consumer demand by poor households. After having successfully unpacked the contents of the black box behind our monetary system we can move on to FinTech and why it is starting to shape the financial systems in Africa.

5 FINTECH: THE SCRAMBLE FOR AFRICA

Roughly two thirds of the unbanked people globally live in Africa.¹⁰⁷ Financial exclusion is often described as a serious deterrent to economic development. Data technology may help to gather critical information for assessing financial risk based on income, and to do this more cheaply than traditional banks. Further, it is often argued that the high proportion of young people in the region (with 70 percent of the Sub-Saharan population being under the age of 30),¹⁰⁸ migration, and increasing geographical mobility in Africa all contribute to tech-openness and the dependence on financial services (for example for remittances) while concerns over data privacy rank rather low in public discourse.¹⁰⁹ Some observers therefore describe FinTech in Africa as “digital or data colonialism”, charging exorbitant fees to poor communities, with the US and China being the empires of that digital colonialism.¹¹⁰

“Without inclusive financial systems, poor people must rely on their own limited savings to invest in their education or become entrepreneurs—and small enterprises must rely on their limited earnings to pursue promising growth opportunities.”¹¹¹

World Bank (2017), *The Global Findex Database: Measuring Financial Inclusion and the Fintech Revolution*

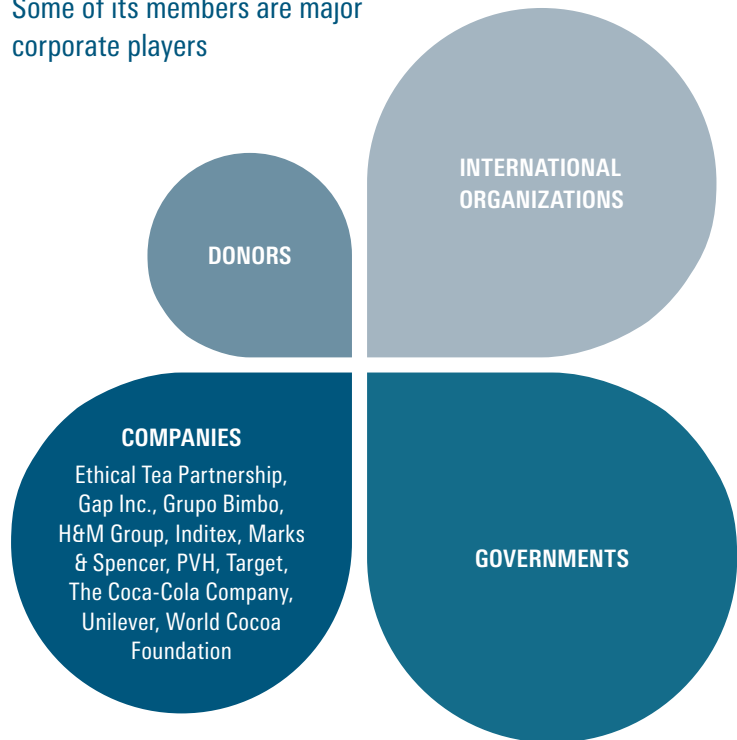
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107 Langley and Leyshon, “Neo-colonial credit”, p. 403. **108** “Young People’s Potential, the Key to Africa’s Sustainable Development”, *United Nations*, 23 February 2021, available at <https://www.un.org/ohrlls/news/young-people’s-potential-key-africa’s-sustainable-development>. Last accessed on 4 January 2023. **109** “Top reasons why Africa represents a big opportunity for FinTech”, *PaymentGenes*, 14 September 2021, available at <https://www.paymentgenes.com/all-about-payments-videos/top-reasons-why-africa-represents-a-big-opportunity-for-fintech>. Last accessed on 4 January 2023. **110** Langley and Leyshon, “Neo-colonial credit”, p. 403. **111** A. Demirgüç-Kunt, L. Klapper, D. Singer, S. Ansar, and J. Hess, “The Global Findex Database: Measuring Financial Inclusion and the Fintech Revolution”, World Bank Policy Research Working Paper no. 6025, 2017, p. 1. **112** Serena Natile, “Digital Finance Inclusion and the Mobile Money ‘Social’ Enterprise: A Socio-Legal Critique of M-Pesa in Kenya”, *Historical Social Research*, vol. 45, no. 3, p. 78.

5.1 THE POLITICS OF FINTECH IN AFRICA

On a political level, key players in FinTech are international organizations, corporate lobby groups, and public-private partnerships, and these include for instance the G20, the International Monetary Fund (IMF), the World Bank, the World Economic Forum, the UN Capital Development Fund (UNCDF), the Gates Foundation, Financial Sector Deepening Kenya (FSD Kenya); the Groupe Speciale Mobile Association (GSMA) which represents mobile network operators (MNO); the Alliance for Financial Inclusion (AFI), comprising regulators in the Global South¹¹²; and the Better Than Cash Alliance. As the private sector is heavily involved and Western governments dominate the bulk of these organizations, the power imbalance may potentially undermine the tech and data sovereignty of African countries.

Better Than Cash Alliance

Some of its members are major corporate players



Source: <https://www.betterthancash.org/about/members>

THE MIROCFINANCE LOBBY

FinTech plays an important role in the agendas of international development and donor organizations, marking a shift from state-led poverty reduction to poverty finance (such as microcredit enabling entrepreneurship) and subsequently to poverty payment (where FinTechs and financial inclusion are being sold to the public as a method of fighting poverty).¹¹³ In the 1990s, structural reforms in developing countries such as privatization, market liberalization, and the curtailing of state expenditure were enforced by the IMF and the World Bank.¹¹⁴ In parallel, there was the increasingly influential idea that microcredit could boost the entrepreneurial activities of poor people and lift them out of poverty via uncollateralized group loans. Muhammad Yunus, director of the Grameen Bank, was an advocate of microcredit and was later awarded the Nobel Peace Prize for this idea.¹¹⁵

According to proponents of microfinance, it would enable disadvantaged groups such as women from poorer communities (without assets such as land to use as collateral) to kick-start a micro-enterprise. Loans would be mutually insured within the community. It was assumed that pooling and spreading the default risks of a single

person across a collective would lead to better financing conditions. Further, community discipline, led by the women involved, would stoke collective entrepreneurial activity and promote (or indeed enforce) economic discipline and productivity among borrowers. The banking industry also saw microcredit as tool to tap previously unbanked people as a profit opportunity. Microcredit was later frequently criticized for privatizing the fate of the poor, exerting group pressure on borrowers in the event of economic failure, and leading to bad economic outcomes.¹¹⁶

Economists such as Milford Bateman and Fernando Amorim Teixeira blame the oversupply of microfinance at the turn of the millennium for “rising poverty and vulnerability; forced migration; loss of collateral, including land; the rise of modern debt slavery; and frequent financial meltdowns and near-meltdowns, the most famous being the microcredit meltdown in the state of Andhra Pradesh in India in 2010”.¹¹⁷

The Better Than Cash Alliance is an interesting example of an organization that lobbies for financial inclusion and blurs the lines between public interest and private benefit. It is comprised of “80 members committed to digitizing payments. These include national governments from Africa, Asia-Pacific and Latin America, global brands across the agriculture, garment and ... consumer good sectors, UN agencies and humanitarian non-governmental organization (NGOs)”.

The companies involved include Coca-Cola, H&M, Unilever, and Marks & Spencer.¹¹⁸ The Alliance’s funding partners comprise among others the Bill & Melinda Gates Foundation, USAID, Visa, the Swiss Federal Department of Economic Affairs, Education and Research (EAER), the German Federal Ministry for Economic Cooperation and Development (BMZ), and the UN Capital Development Fund. The latter is an ancillary body of the UN and works with the UN Development Programme to unlock public and private capital in funding development projects.¹¹⁹

The Better Than Cash Alliance markets itself (quite misleadingly) as a de facto organization of the United Nations, since it has an office at the UN headquarters. The Alliance tries to advance digital payments in areas such as humanitarian assistance. For example, refugee cards (similar to a bank cash card) are seen as being a route to enable fast payments to refugees during natural disasters.

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¹¹³ See Natile, “Digital Finance Inclusion”; Langley and Leyshon, “Neocolonial credit”, p. 402. ¹¹⁴ See Joseph E. Stiglitz, *Globalization and Its Discontents*, New York: W.W. Norton and Company, 2002. ¹¹⁵ Nobel Peace Prize Committee (2006), “Muhammad Yunus: Biographical”, *NobelPrize.org*, available at <https://www.nobelprize.org/prizes/peace/2006/yunus/biographical/>. Last accessed on 4 January 2023. ¹¹⁶ J. Hickel, “The microfinance delusion: who really wins?” *The Guardian*, 10 June 2015, available at <https://www.theguardian.com/global-development-professionals-network/2015/jun/10/the-microfinance-delusion-who-really-wins>. Last accessed on 4 January 2023. ¹¹⁷ M. Bateman and F. A. Teixeira, “The Promises and Perils of Investor-Driven Fintech: Forging People-Centered Alternatives”, *Transnational Institute, Digital Futures Paper*, February 2022, p. 26. ¹¹⁸ “Members”, *Better Than Cash Alliance*, 2022, available at <https://www.betterthancash.org/about/members>. Last accessed on 4 January 2023. ¹¹⁹ *Ibid.*

“Households headed by women increased education spending by 20% when given access to a digital savings account.”

“By choosing to have a portion of their salaries automatically deposited into mobile phone savings accounts, workers at a firm saved 37% of their salary on average in the first 6 months.”

Statements on the homepage of the Better Than Cash Alliance¹²⁰

While it may be necessary that governments in developing countries as well as supranational institutions with limited budgets try to benefit from the technological capacities of private corporations, it entails great risks such as conflicts of interest. Secure saving options for workers may incentivize better planning around economic expenditure and small-scale investment with the goal of improving living conditions. However, the root cause of low saving is low income, not technology. In any case, it is questionable whether there is a fair balance of power when Visa or Coca-Cola advise the republic of Malawi.

The Better Than Cash Alliance demonstrates the blurring of the line between development aid and private business and the need for policy makers and civil society to scrutinize technological policies in finance. Most African countries face social emergencies and, for huge parts of the population, a lack of access to basic services and infrastructure such as housing, water, health, sanitation, or safety, hence issues of data sovereignty and technology policies rank low in public debates. As corporations strive to integrate every corner of the world—and hence informal economies with their cash-based systems—into the web of data and finance, people living, working, and trading outside of the digital payment system are seen as being a barrier to the expansion of surveillance capitalism.¹²¹

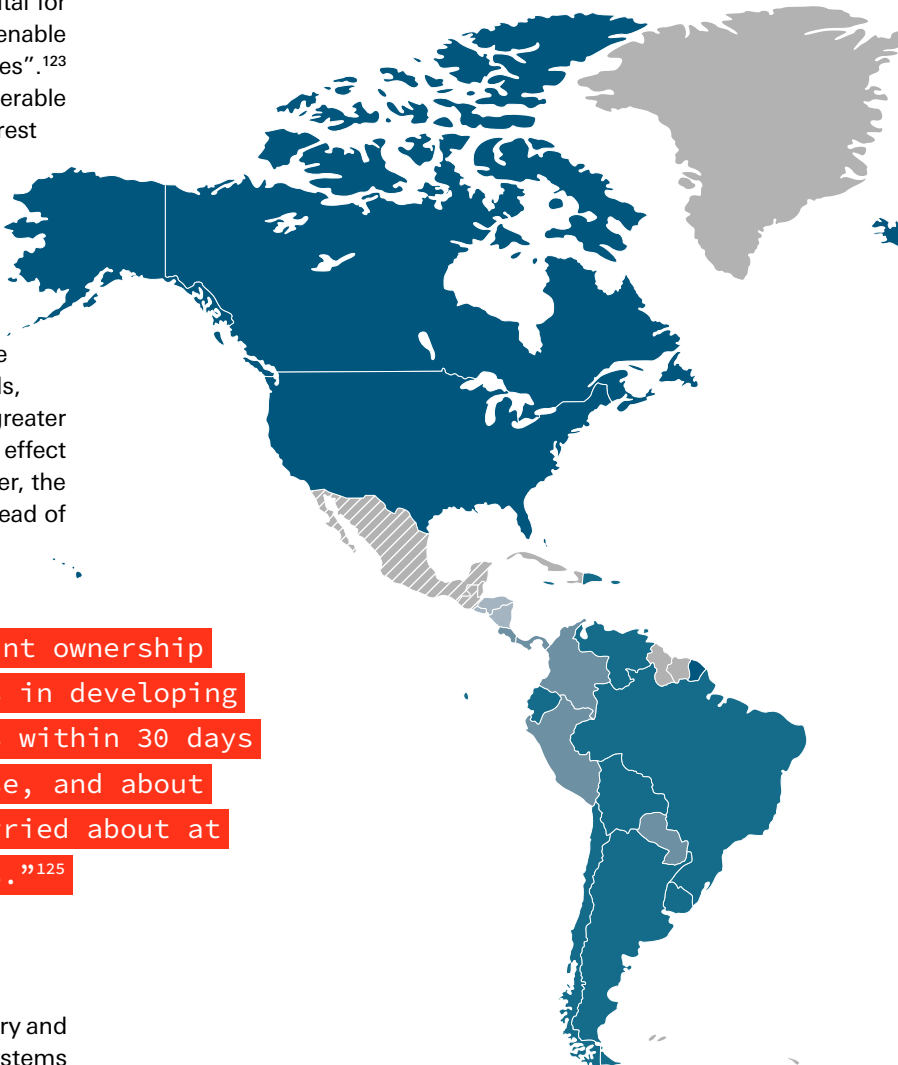
“A small, informal ‘Chama’ savings group managed by elderly Kenyan women is seen as quaint, but inferior to a large-scale app presented at TechCrunch Disrupt by flashy entrepreneurs. Financial inclusion is not envisaged as [being] thousands of Kenyan women’s co-operatives flourishing. Rather, it entails dissolving those informal systems, and onboarding the women into large-scale corporate systems that will replace their cooperatives.”¹²²

Brett Scott, former broker, monetary anthropologist, and author of *Cloudmoney: Cash, Cards, Crypto and the War for Our Wallets*

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120 Ibid. 121 B. Scott, *Cloudmoney* pp. 83–87. 122 Ibid., pp. 130–31.

The classic argument for financial inclusion is, in the words of Thouraya Triki and Issa Faye, that “access to financial services will mobilize greater household savings, marshal capital for investment, expand the class of entrepreneurs, and enable more people to invest in themselves and their families”.¹²³ Further, financial exclusion may lead to becoming vulnerable to doorstep lending, pawnbrokers, and exorbitant interest rates from loan sharks, exploiting those from poverty-stricken households.¹²⁴

Distinction should be made between what are the causes and what are the effects of poverty. For example, financial exclusion and the lack of finance to fund investment for small-scale farmers, or the financial dependency of women on their husbands, are often connected to poverty itself. However, a greater use of FinTech by private households may be the effect and not the cause of socio-economic progress. Further, the bulk of digital lending is for private consumption instead of investment (see case studies in chapter 6).



“Despite promising growth in account ownership and use, only about half of adults in developing economies could access extra funds within 30 days if faced with an unexpected expense, and about two-thirds of adults were very worried about at least one area of financial stress.”¹²⁵

The Global Findex Database 2021

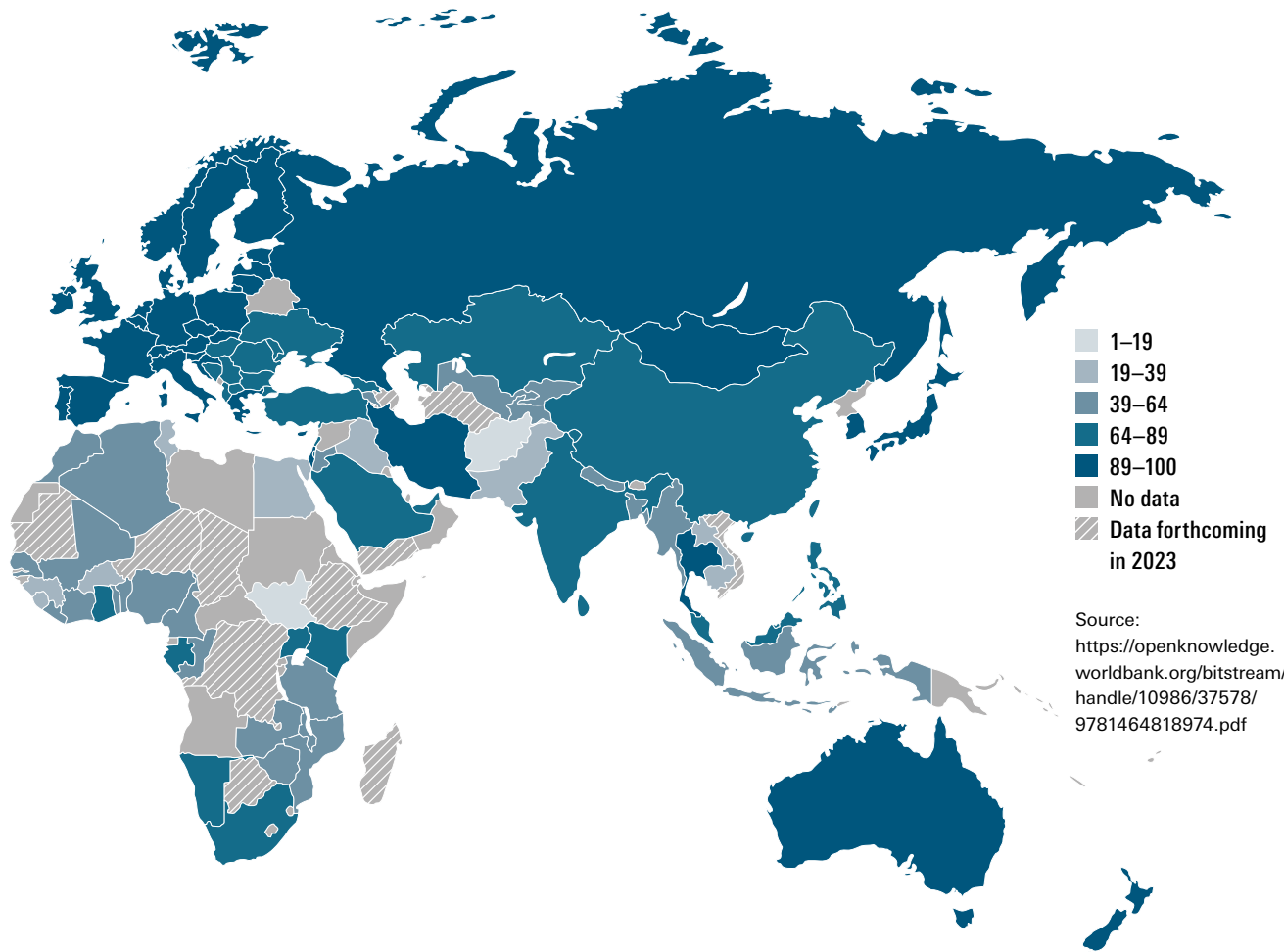
While precolonial Africa had a long history of monetary and even credit relationships,¹²⁶ the modern banking systems in most African countries had their roots in facilitating the colonial exploitation of minerals and raw materials, and did not serve the larger parts of the domestic population and small business. Banking is often highly concentrated and the gap between those borrowing money and those depositing it is very high, which is highly profitable for banks but incurs high costs for businesses.¹²⁷

Regional and judicial fragmentation across borders in Africa due to the colonial drawing of borders, armed conflict, shaky governance, and hence weaker regional integration compared to other areas in the world all contribute to higher costs in banking. Further, risk of currency devaluation is quite high with many African countries lacking sufficient monetary sovereignty due to high external debt.¹²⁸ High transaction fees in banking are hence a further deterrent to the use of traditional bank services for low-income households. Irregular income and high fees hence not only contribute to low account ownership but also to low usage of existing accounts.¹²⁹

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 123 T. Triki and I. Faye, *Financial Inclusion in Africa*, Tunis: African Development Bank, 2013, p. 25, available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Financial_Inclusion_in_Africa.pdf. Last accessed on 4 January 2023. 124 V. Thiel, *Doorstep Robbery: why the UK needs a fair lending law*, London: *The New Economics Foundation*, 2009, pp. 19–22, available at https://neweconomics.org/uploads/files/ba4652645aa9335c7e_o8m6ibdcn.pdf. Last accessed on 4 January 2023. 125 A. Demirgüç-Kunt, L. Klapper, D. Singer, and S. Ansar, *Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*, Washington, DC: World Bank, 2022, p. 2, available at <https://openknowledge.worldbank.org/bitstream/handle/10986/37578/9781464818974.pdf>. Last accessed on 4 January 2023. 126 See for example A. G. Adebayo, “Money, Credit, and Banking in Precolonial Africa: The Yoruba Experience”, *Anthropos*, vol. 89, no. 4, pp. 379–400. 127 “Why interest rates are so high in Africa”, *The Economist*, 21 May 2020, available at <https://www.economist.com/finance-and-economics/2020/05/21/why-interest-rates-are-so-high-in-africa>. Last accessed on 4 January 2023. 128 “Debt repayment costs are rising fast for many African countries”, *The Economist*, 30 April 2022, available at <https://www.economist.com/middle-east-and-africa/2022/04/30/debt-repayment-costs-are-rising-fast-for-many-african-countries>. Last accessed on 4 January 2023. 129 D. Makina (ed.), “An Overview of Financial Services Access and Usage in Africa”, *Extending Financial Inclusion in Africa*, Cambridge (MA): Academic Press, 2019, pp. 3–12.

Account Ownership Rate

Adults with a bank or mobile money accounts %, 2021



5.2 THE ROLE OF MOBILE NETWORKS IN AFRICAN FINTECH

Over 80 percent of employment in Africa is informal.¹³⁰ Informal employment usually means high uncertainty about regular income and a lesser ability to plan one’s own life, service debt, or build up savings. Hence, a significant proportion of the adult population also lacks bank accounts.¹³¹ Further, with unstable incomes, a high proportion of unregistered people, and legal uncertainty regarding land ownership and other assets it is harder for banks to enforce repayment of debt or conduct proper risk assessment of customers and businesses.

Hence, it is often argued that the ability of FinTech companies to collect (often “unconventional”) data through digital means will lower the cost of risk assessment and hence also the cost of borrowing.¹³² FinTech companies may collect a much broader range of data via discount cards (for example alcohol purchases) or phones (for example the kind of content people read on the internet) than a traditional

bank. This data is unconventional as on the surface it is unrelated to finance but nevertheless will be used to assess people’s economic capacity (for example higher alcohol consumption indicating economic or financial risk). It is argued that these difficult conditions for banking spurred early innovation in FinTech, as a huge part of the population had traditionally not been well serviced by banks.¹³³

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¹³⁰ “Informal Economy in Africa: Which Way Forward? Making Policy Responsive, Inclusive and Sustainable”, *International Labour Organization*, panel discussion of 10–11 May 2022, notes available at https://www.ilo.org/africa/events-and-meetings/WCMS_842674/lang-en/index.htm. Last accessed on 4 January 2023. ¹³¹ Demirgüç-Kunt et al., *The Global Findex Database 2021*. ¹³² Jagtiani and Lemieux, “Fintech Lending”, p. 2. ¹³³ M. Flötotto, E. Gold, U. Jeenah, M. Kuyoro, and T. Olanrewaju, “Fintech in Africa: The end of the beginning”, *McKinsey*, 30 August 2022, available at <https://www.mckinsey.com/industries/financial-services/our-insights/fintech-in-africa-the-end-of-the-beginning>. Last accessed on 4 January 2023.

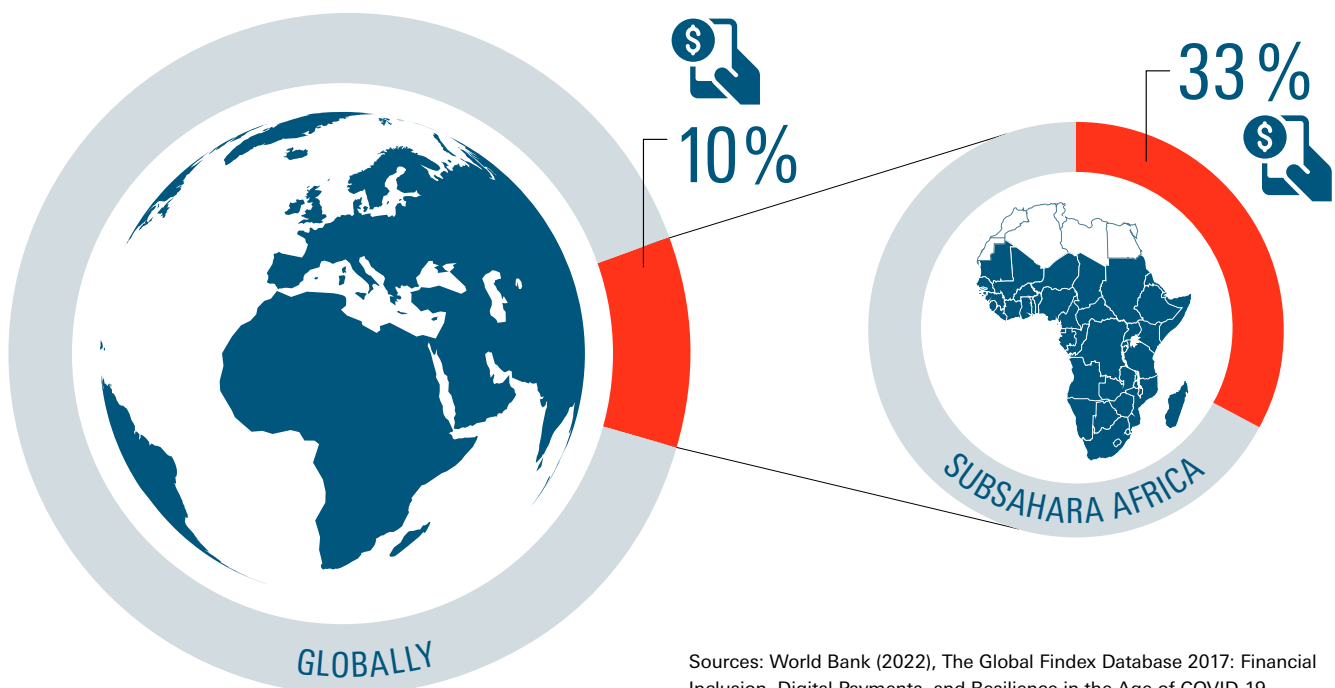
The expansion of mobile telecommunication networks across Africa from the early 2000s led to the emergence of an informal monetary system around cellular “airtime currency” (as people could transfer airtime, i.e. phone credit, to each other).¹³⁴ Further, in recent years smartphone and internet penetration as well as access to bank accounts have increased steeply along with economic development.¹³⁵ However, FinTech ecosystems in Africa are still primarily built around feature phones (phones which have some apps and internet connectivity but are not as powerful or adaptable as smartphones).¹³⁶

Uganda and South Africa saw the biggest growth rate in bank account ownership, increasing by over 25 percent since 2011. Ownership increased from 10 to 27 percent in Egypt, and from 30 to 45 percent in Nigeria.¹³⁷

While account ownership is still lagging behind industrialized areas of the world, Sub-Saharan Africa is leading in mobile money account ownership. An important catalyst was M-Pesa which was a service launched through a public-private partnership with funding from the UK government, although its activities have focused on Africa (see chapter 6 country studies).

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134 Langley and Leyshon, “Neo-colonial credit”, p. 401. **135** The World Bank’s *Global Findex Database 2021* defines account ownership as “ownership of an individual or jointly owned account at a regulated institution, such as a bank, credit union, microfinance institution, post office, or mobile money service provider. Data on adults with an account also include an additional 3 percent of respondents who reported having a debit card in their own name; receiving wages, government transfers, a public sector pension, or payments for the sale of agricultural products into a financial institution account or mobile money account in the past 12 months; or paying utility bills from a financial institution account in the past 12 months. Financial institution refers to banks and other financial institutions in a specific country that offer a transaction account and that fall under prudential regulation by a government body (excluding mobile money accounts). The definition does not include non-bank financial institutions such as pension funds, retirement accounts, insurance companies, or equity holdings such as stocks. Data on adults with a mobile money account only include respondents who personally used a mobile money service to make payments, buy things, or to send or receive money in the past 12 months”. See Demirgüç-Kunt et al., *The Global Findex Database 2021*, p. 15. **136** Langley and Leyshon, “Neo-colonial credit”, p. 404. **137** Demirgüç-Kunt et al., *The Global Findex Database 2021*.

33 percent of adults in Sub-Saharan Africa own a mobile money account, compared with 10 percent of adults globally



Sources: World Bank (2022), *The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*

The growth of mobile money accounts can be attributed to the strong presence of mobile money services. Of the 11 economies in which mobile money accounts outnumber those of traditional financial institutions (among adults), all are in Sub-Saharan Africa. Mobile money accounts are not simply an additional option for people who already own a bank account. In many economies in Sub-Saharan Africa the growth in mobile money accounts was accompanied by a decline in accounts with traditional financial institutions.¹³⁸

Mobile money services were initially launched so that people could send remittances to friends and family living elsewhere in the country. Hence, like PayPal, mobile money was not about creation of 'new' money in the form of digital credit (as is common in banking), but was rather a way to plug into the existing money system to channel funds from person A (whether these funds were bank money or cash) to person B.¹³⁹

Use of mobile money accounts has also shifted into other contexts. According to the Findex Database, three in four mobile account owners in Sub-Saharan Africa used their mobile money account to make or receive at least one payment that was not person-to-person (peer-to-peer). In Sub-Saharan Africa the share of mobile money account holders that use their account to save is equal to the share of account holders in traditional financial institutions that use a savings account. Mobile money accounts are also used for borrowing to a certain (albeit limited) extent.¹⁴⁰ The use of mobile money accounts is particularly high in Kenya.

“33 percent of adults
[in Sub-Saharan Africa have]
a mobile money account,
compared with 10 percent
of adults globally.”¹⁴¹

World Bank (2022), *The Global Findex Database 2017: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*

Mobile money is hence a classic example of how the advantages of specialization (operating a phone network but not running a bank branch with a back office) can trigger technological innovation in finance outside of the banking sector. However, it mainly serves to shift liquidity within personal networks rather than creating additional money or credit for investment.

As will be shown in the country studies in the next chapters, the rise of FinTech apps have also led to serious data breaches, exorbitant interest rates, and unethical lending practices, including putting pressure on the personal contacts of indebted households via text messaging in the case of late payments or defaults. Further, there is a high risk of non-performing loans in the sector, as a lot of people who use FinTech services struggle to obtain traditional bank loans.

Corporations are increasingly targeting Africa as an investment destination for FinTech-powered data mining.¹⁴² According to a 2021 study published by tech research company Disrupt Africa, the FinTech sector in Africa received over USD 2 billion via the fundraising of African tech startups.¹⁴³ Major African financial centres such as Kenya, Egypt, Nigeria, and South Africa (the 'big four' in FinTech¹⁴⁴ which amount to 92 percent of Africa's FinTech investment), or shadow or financial secrecy jurisdictions¹⁴⁵ such as Mauritius, became a laboratory for the home-grown FinTech industry.¹⁴⁶

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¹³⁸ Ibid. ¹³⁹ Ibid., p. 3. ¹⁴⁰ Ibid. ¹⁴¹ Ibid., p. 17. ¹⁴² “Top reasons why Africa represents a big opportunity for FinTech”, *PaymentGenes*. ¹⁴³ Tom Jackson, “50% of African tech’s \$2bn funding pot went to fintech startups in 2021”, *Disrupt Africa*, 8 February 2022, available at <https://disrupt-africa.com/2022/02/08/50-of-african-techs-2bn-funding-pot-went-to-fintech-startups-in-2021/>. Last accessed on 4 January 2023. ¹⁴⁴ A. Dushime, “These four countries are leading Africa’s start-up scene — here’s why”, *World Economic Forum*, 24 August 2022, available at <https://www.weforum.org/agenda/2022/08/africa-start-up-nigeria-egypt-kenya-south-africa/>. Last accessed on 4 January 2023. ¹⁴⁵ According to the Tax Justice Network, a “secrecy jurisdiction provides facilities that enable people or entities to escape or undermine the laws, rules and regulations of other jurisdictions elsewhere, using secrecy as a prime tool”. See “What is a secrecy jurisdiction?”, *TJN*, available at <https://taxjustice.net/faq/what-is-a-secrecy-jurisdiction/>. Last accessed on 12 January 2023. ¹⁴⁶ A. R. Thomas, “Fintech, other knowledge-intensive services could drive Africa’s prosperity, boost inclusion”, *Sierra Leone Telegraph*, 25 September 2022, available at <https://www.thesierraleonetelegraph.com/fintech-other-knowledge-intensive-services-could-drive-africas-prosperity-boost-inclusion/>. Last accessed on 4 January 2023.

6 FINTECH IN AFRICA: THE BIG TWO

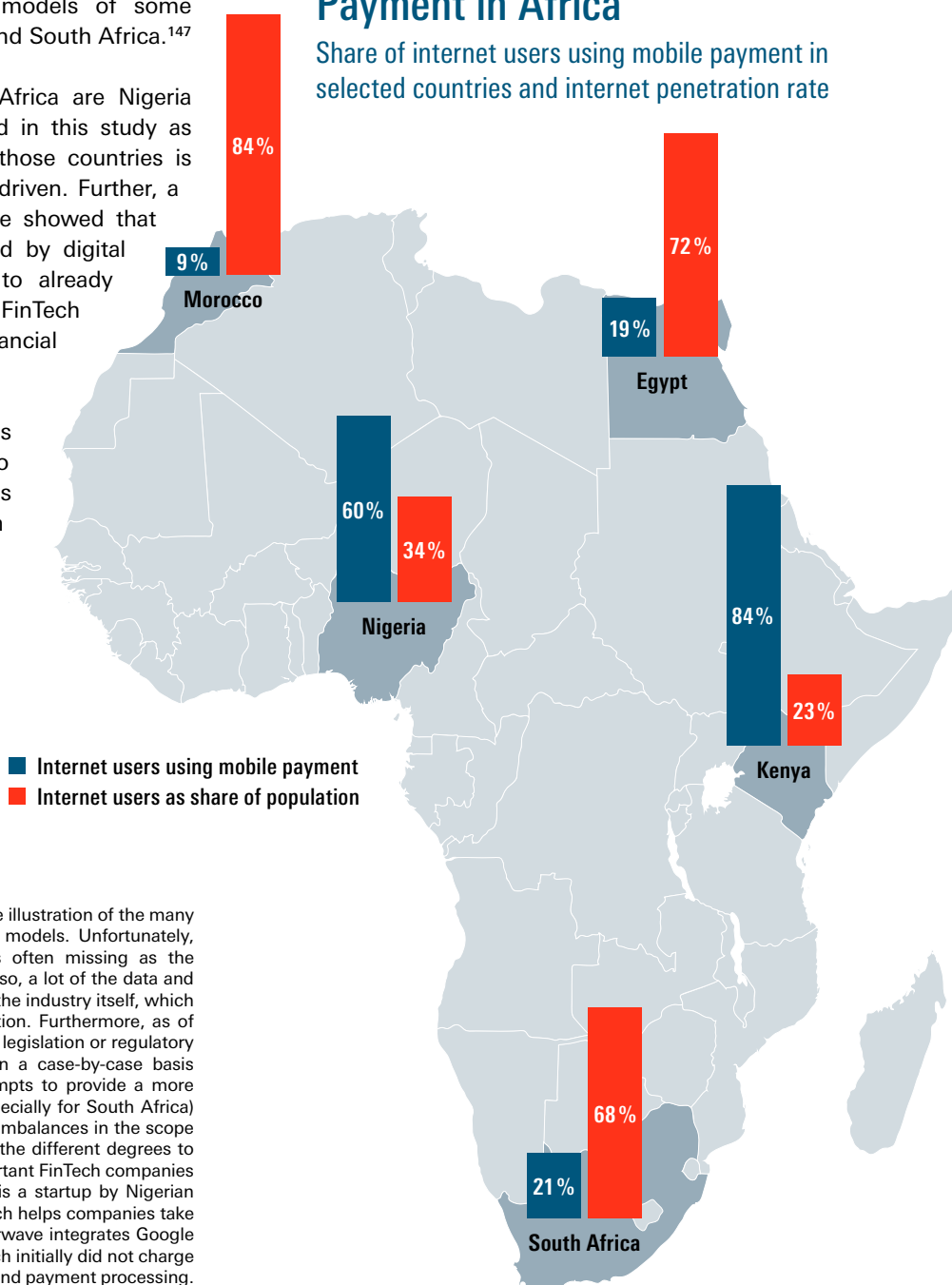
The next sections serve to illustrate the broader FinTech landscape in two of the biggest African FinTech markets and to highlight selected business models of some important FinTech platforms in Kenya and South Africa.¹⁴⁷

The other big FinTech economies in Africa are Nigeria and Egypt. Neither have been included in this study as the literature and data on FinTech in those countries is somewhat limited and mainly industry driven. Further, a preliminary assessment of the literature showed that FinTech in Nigeria is largely dominated by digital banks which improve digital access to already banked customers.¹⁴⁸ The Nigerian FinTech landscape is hence less indicative of financial inclusion of underbanked people.

In this study, a special emphasis in terms of scope and depth has been given to Kenya and the case of M-Pesa, as it is the best-researched FinTech platform in Sub-Saharan Africa.

The Potential of Mobile Payment in Africa

Share of internet users using mobile payment in selected countries and internet penetration rate



¹⁴⁷ The country cases cannot provide an exhaustive illustration of the many different FinTech corporations and their business models. Unfortunately, well-structured literature on FinTech in Africa is often missing as the industry is still nascent and not well researched. Also, a lot of the data and literature on FinTech in Africa is also dominated by the industry itself, which may not be the most objective source of information. Furthermore, as of yet there are only rare instances of specific FinTech legislation or regulatory bodies. Mostly financial supervision is applied on a case-by-case basis to new business models. Hence, this report attempts to provide a more generalized outlook. A more in-depth analysis (especially for South Africa) will be attempted in a future publication. Potential imbalances in the scope and depth of the two country studies also owe to the different degrees to which relevant literature is available. ¹⁴⁸ Two important FinTech companies in Nigeria are Flutterwave and Kuda. Flutterwave is a startup by Nigerian entrepreneurs headquartered in San Francisco which helps companies take their business online and receive payments. Flutterwave integrates Google Pay. Kuda is a London-based digital-only bank, which initially did not charge any fees and generates revenues from data mining and payment processing. It was Nigeria's first licensed mobile-only bank, and tried to capitalize on weak banking infrastructure and service in Nigeria. The FinTech company recently was estimated to have roughly 2 million customers and its initial business model was to provide digital banking services to people who also have accounts with commercial banks without having to visit a physical branch. See J. Urowayino, "Kuda Bank: Broadening banking access with innovation", *Vanguard*, 12 January 2022, available at <https://www.vanguardngr.com/2022/01/kuda-bank-broadening-banking-access-with-innovation/>. Last accessed on 4 January 2023.

Mobile payment users: 1,000 to 2,000 internet users surveyed per country in 2021. Internet use data from 2020 (or 2019 if not available).

Sources: Statista Global Consumer Survey, World Bank

6.1 THE FINTECH LANDSCAPE OF KENYA

Kenya has a population of over 54 million people¹⁴⁹ and a GDP equivalent to just over USD 2000 per capita. This is well below South Africa (nearly USD 7000).¹⁵⁰ Kenya is a strong regional hub for foreign tech investment (sometimes being dubbed “Silicon Savannah”).¹⁵¹ Recently, foreign companies such as Microsoft and Visa have scaled up their presence, with Microsoft establishing an office of its African Development Centre (ADC) as well as the Microsoft Africa research institute, and Visa launching an innovation studio.¹⁵² Kenya is estimated as being the home to 600 tech startups, of which 150 are FinTech companies.¹⁵³

Kenya has huge social disparities in terms of income inequality, with a Gini coefficient of around 40 (40.8 in 2015), however this is lower than in South Africa (63 in 2014).¹⁵⁴ In 2015 nearly 30 percent of the population lived on less than \$2.15 (US) a day.¹⁵⁵ In terms of domestic credit to the private sector as a percentage of GDP, as of 2020 Kenya (32.1 percent) trails South Africa (112 percent).¹⁵⁶

Kenya has often been hailed as a successful example of the possible contribution FinTech can make to development, potentially moving two percent of the country’s population out of poverty¹⁵⁷ as it would significantly reduce the cost of banking and hence the cost of finance for the poor.¹⁵⁸ The methodology and results of this study are however strongly contested, as is discussed in more detail in chapter 6.1.1.¹⁵⁹

Kenya inherited from the colonial settler economy highly uneven access to financial services when comparing urban centres such as Nairobi and Mombasa to what is provided to rural areas.¹⁶⁰ The urban-rural division matters a great deal as 72 percent¹⁶¹ of the Kenyan population inhabits rural areas and most of the country’s labour force are still employed in agriculture.¹⁶² Only 23 percent of the population use the internet, which is the lowest percentage among the top three FinTech economies of Sub-Saharan Africa, and indicates the highly uneven access to key infrastructure in Kenya. However, the low share of internet users contrasts with the high share of mobile payment among those internet users (84 percent). Kenya has roughly 59 million mobile phone users, of which 33 million are feature phones rather than smartphones.¹⁶³

East Africa recorded more active mobile money users than any other parts of Africa, with around 94 million active accounts. Within East Africa, Kenya with 68 million records the most of these active mobile money accounts.¹⁶⁴ Kenya also has the highest share of people who use mobile money accounts for financial activities such as saving and borrowing. In 2011, before mobile money hit Kenya, account ownership at a financial institution stood at only 42 percent of the adult population (people aged 15 and older). It had increased to 51 percent by 2021. However, if we include mobile money accounts, the figure stands at 79 percent.¹⁶⁵ At the same time, the income gap in account

ownership is still remarkable. In Kenya, wealthier adults are about 20 percentage points more likely than poorer adults to have an account.¹⁶⁶

Account ownership in Kenya has generally increased in line with economic development. Nevertheless, for Kenya there are strong indications that mobile money accounts have indeed been a game changer. However, this should be taken with the caveat that mobile money account ownership is still concentrated among the urban population—if we look at over-25s in 2021, for example, 79 percent of this demographic in urban areas had an account, compared to 64 percent in rural areas.¹⁶⁷

149 “Kenya”, *World Bank*, 2022, available at <https://data.worldbank.org/country/KE>. Last accessed on 4 January 2023. 150 “GDP per capita (current US\$) – Kenya”, *World Bank*, 2022, available at <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=KE>. Last accessed on 4 January 2023. 151 C. Onyango, “Kenya upgrades [its] ‘Silicon Savannah’ drawcard”, *Mail & Guardian*, 18 June 2022, available at <https://mg.co.za/opinion/2022-06-18-kenya-upgrades-its-silicon-savannah-drawcard/>. Last accessed on 4 January 2023. 152 R. Santosdiaz, “Kenya and Its Fintech Ecosystem in 2022”, *FinTech Times*, 7 July 2022, available at <https://thefintechtimes.com/kenya-and-its-fintech-ecosystem-in-2022/>. Last accessed on 4 January 2023. 153 *FinTech Times*, *FinTech: Middle East and Africa 2021*, pp. 46–47, available at https://issuu.com/fintechtimes/docs/the_fintech_times_fintech-middle_east-africa_2021_. Last accessed on 4 January 2023. 154 The Gini coefficient measures income inequality where a value of zero denotes a perfect equality of income whereas a value of 1 or 100 percent expresses maximum inequality. See “Gini index – Kenya”, *World Bank 2022*, available at <https://data.worldbank.org/indicator/SI.POV.GINI?locations=KE>. Last accessed on 4 January 2023. 155 “Kenya”, *World Bank*. 156 “Domestic credit to private sector (% of GDP) – Kenya”, *World Bank*, 2022, available at <https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS?locations=KE>. Last accessed on 4 January 2023. 157 T. Suri and W. Jack, “The long-run poverty and gender impacts of mobile money”, *Science*, 9 December 2016, vol. 354, no. 6317, pp. 1288–92. 158 J. Aron, “‘Leapfrogging’: A Survey of the Nature and Economic Implications of Mobile Money”, Centre for the Studies of African Economies Working Paper Series, 2017-02, pp. 1–133. 159 M. Bateman, M. Duvendack, and N. Loubere, “Another False Messiah: The Rise and Rise of Fin-tech in Africa”, *Review of African Political Economy*, 11 June 2019, available at <http://roape.net/2019/06/11/another-false-messiah-the-rise-and-rise-of-fin-tech-in-africa/>. Last accessed on 4 January 2023. 160 N. Bernards, “Colonial Financial Infrastructures and Kenya’s Uneven Fintech Boom”, *Antipode*, vol. 54, no. 3, 2022, pp. 708–28. 161 “Rural population (% of total population) – Kenya”, *World Bank*, 2021, available at <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=KE>. Last accessed on 4 January 2023. 162 L. Kamer, “Employment by economic sector in Kenya 2011-2020”, Statista, 10 November 2022, available at <https://www.statista.com/statistics/1186971/employment-by-economic-sector-in-kenya/>. Last accessed on 4 January 2023. 163 J. Amboko, “Low smartphone penetration hits CBK’s digital shilling plan”, *Business Daily*, 23 March 2022, available at <https://www.businessdailyafrica.com/bd/economy/smartphone-hitch-hits-cbk-s-digital-currency-3756986>. Last accessed on 4 January 2023. 164 F. Ngila, “East Africa firms grip on Africa mobile money”, *Business Daily*, 8 April 2021, available at <https://www.businessdailyafrica.com/bd/data-hub/east-africa-firms-grip-on-africa-mobile-money-3353858>. Last accessed on 4 January 2023. 165 Demirgüç-Kunt et al., *The Global Findex Database 2021*. 166 *Ibid.*, p. 25. 167 These figures are based on the Findex “Data Dashboard”. See “The Global Findex Database 2021”, *World Bank*, available at <https://www.worldbank.org/en/publication/globalindex/>. Last accessed on 24 January 2023.

A (VERY) SHORT HISTORY OF BANKING IN KENYA

The important role which the financial system plays for a country such as Kenya, with its moderate GDP per capita, is rooted in white settler colonialism: initially, land titles were tied to productive use of land but as many settlers with smaller farm holdings relied on the colonial financial system of Kenya (as opposed to finance from London) they lobbied the crown to be able to pledge land as collateral in order to take out loans to help fund their agricultural production.¹⁶⁸ Already before decolonialization, credit was selectively extended to African Kikuyu farmers in cooperatives (to provide greater security for lenders via group loans in the absence of land titles) to expand the base of taxation, contain political unrest, minimize need for state support, and escape the limits upon the colonial minority economy's profitable deployment of capital.¹⁶⁹

Nick Bernards argues that those disparities between settler farmers and the native African population—as well as disparities within the latter—were largely maintained by the postcolonial elites. Land redistribution mainly benefitted Kikuyu elites with political ties, enabling them to obtain larger land holdings, while other African farmers could mainly only lease land from the state and lacked proper land titles. Further, capital flight after decolonization led to policies to stimulate inward Foreign Direct Investment (FDI) which ensured the dominance of British finance. Even the World Bank observed that commercial banks directed their funds predominantly to urban areas and above all to foreign-owned firms.¹⁷⁰ Further, structural reforms in the 1990s even led to the removal of interest rate caps,¹⁷¹ leading to volatile borrower rates, growing concern about bad debt, and hence credit rationing.¹⁷²

6.1.1 M-Pesa: Data Colonialism or Philanthropic Capitalism?

M-Pesa has been a game changer in Kenya for FinTech, maintaining its position as the most important platform in Kenya, while laying the groundwork for other significant FinTech services.¹⁷³

M-Pesa (M for mobile, and pesa the Kiswahili word for money) is perhaps the most striking example of mobile money use in Africa. It enabled the withdrawal of money at stores, the conversion of cash and airtime into electronic money, the transfer of funds to other users, and the paying of bills. It hence allowed electronic money transactions without the need for bank accounts or smartphones, as these transactions can be simply carried out using SMS.

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¹⁶⁸ Bernards, "Colonial Financial Infrastructures and Kenya's Uneven Fintech Boom", p. 712. ¹⁶⁹ Ibid., p. 714. ¹⁷⁰ "Kenya: Into the second decade", *World Bank*, 30 June 1975, p. 274, available at <http://documents.worldbank.org/curated/en/451711468752380581/Kenya-Into-the-second-decade>. Last accessed on 4 January 2023. ¹⁷¹ Some economists argue that removing price caps would facilitate loans as higher interest rates compensate for higher risks. Other economists disagree as credit markets are subject to information asymmetries and high interest rates might rather attract bad or reckless borrowers and trigger a risk of non-performing loans. ¹⁷² Bernards, "Colonial Financial Infrastructures and Kenya's Uneven Fintech Boom", pp. 715–18. ¹⁷³ A. N. R. Sy, R. Maino, A. Massara, H. Perez-Saiz, and P. Sharma, "FinTech in Sub-Saharan African Countries: A Game Changer?" IMF African Department Departmental Paper No. 2019/004, Washington DC: IMF, 2019, p. 13, available at <https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2019/02/13/FinTech-in-Sub-Saharan-African-Countries-A-Game-Changer-46376>. Last accessed on 4 January 2023.

Kenya's telecom sector was privatized in 1999. M-Pesa was subsequently launched in 2007 by Safaricom and Vodacom, which are the largest mobile networks in Kenya and Tanzania (and both owned by Vodafone).¹⁷⁴ The service quickly expanded to other Sub-Saharan countries, and even to India and Eastern Europe.¹⁷⁵

The development of M-Pesa was a public-private partnership (PPP) by the UK Department for International Development and UK-based company Vodafone.¹⁷⁶ The former head of Social Enterprise at Vodafone, Nick Hughes, claims that he convinced the UK government at the World Summit on Sustainable Development that such a PPP could trigger a win-win situation and help to align developmental goals with the short-term shareholder interest of Vodafone (which would otherwise prevent the pursuit of social objectives) and thus the profit motive.¹⁷⁷

HOW KENYA'S ELITE GAINED FROM M-PESA

*This is an abridged version of a text from Bateman and Teixeira's "The Promises and Perils of Investor-Driven Fintech", p. 38. Kenya's political and economic elite formed a shell company, Mobitelea Ventures, that was registered in the secrecy jurisdiction of Guernsey. That shell company received a minor stake in Safaricom. In return, the owners of Mobitelea Ventures—who were simultaneously in control of regulatory decisions in Kenya—ensured a near-total monopoly for M-Pesa. Mobitelea's ownership stake in Safaricom was later sold back to Vodafone in two tranches, generating significant profits for its owners.*¹⁷⁸

The Central Bank of Kenya (CBK) allowed M-Pesa to operate an account at the Commercial Bank of Africa, managed by the non-profit M-Pesa Holding Company. Later it was decided to spread the funds across several banks to mitigate the risk of collapse through one institution being overexposed. M-Pesa was not regulated as a banking firm because lending, investment, or any other activities had not been foreseen. M-Pesa customers did not receive interest on money paid to M-Pesa. The interest that the banks paid on customer deposits accrued to M-Pesa Holding Company (managed by the M-Pesa Foundation, an independent charitable trust) and Safaricom, and was to be used for philanthropic activities, exempting them from paying taxes on it.¹⁷⁹

Later, both banks and non-banks were allowed to provide mobile money services. However, M-Pesa remains dominant with the most subscriptions. Since the launch of M-Pesa, Safaricom has become Kenya's most profitable company. It is owned partially by the Kenyan government (35 percent), Vodafone (40 percent), and other foreign investors (25 percent).¹⁸⁰ Before the pandemic, Safaricom accounted for 40 percent of the total stock market valuation on the Nairobi securities exchange. Its yearly profits outnumbered the entire healthcare spending of the Kenyan government.¹⁸¹

A huge portion of the profits made by M-Pesa are repatriated back to shareholders in the UK and other countries. The M-Pesa foundation and Safaricom offer financial products and services to the unbanked while also offering financialized access to basic resources.

Privately-run schemes such as M-KOPA, Grundfos-Lifelink, and HELP sell access to healthcare and clean water. "In the mobile money social enterprise basic resources can be bought on credit or through savings schemes, to be repaid in small and/or flexible instalments and, depending on the amount transferred, involve a fee".¹⁸²

Serena Natile, Associate Professor of Law at University of Warwick (UK)

For example, a community in Musingini is working with Safaricom and Grundfos Lifelink (a division of the Danish pump maker Grundfos Group), to implement a solar-powered, pay-for-use water vending system using the M-Pesa backbone. "The solar-powered well is activated using a smart card, which permits water to flow until either the card is removed or the user's account runs out of credit. Villagers can use the M-PESA system to add more credit to the smart card via their mobile phones".¹⁸³

174 Natile, "Digital Finance Inclusion", pp. 74–75. 175 E. Bregu, A. Anamali, and B. Shosha, "The Diffusion of M-Pesa in Developing Countries", *European Journal of Economics and Business Studies*, vol. 5, no. 2, available at https://revistia.com/files/articles/ejes_v5_i2_19/Bregu.pdf. Last accessed on 24 January 2023. 176 Sy et al., "FinTech in sub-Saharan African countries", p. 13. 177 Natile, "Digital Finance Inclusion", p. 81. 178 Ibid., p. 38. 179 Natile, "Digital Finance Inclusion", p. 84. 180 Ibid., p. 85. 181 Bateman et al., "Another False Messiah". 182 Natile, "Digital Finance Inclusion", p. 89. 183 P. Browne, "Solar Power, Mobile Phones Converge to Distribute Water in Kenya", *New York Times*, 3 September 2009, available at <https://archive.nytimes.com/green.blogs.nytimes.com/2009/09/03/solar-power-mobile-phones-converge-to-distribute-water-in-kenya/>. Last accessed on 4 January 2023.

Some economists have criticized the fundamental flaws in an influential study by Tavneet Suri and William Jack¹⁸⁴ which had praised M-Pesa for uplifting the poor in Kenya. The critiques point out that such studies, financed by FSD Kenya and the Gates Foundation, ignore the extraction of economic value from the poor. This would mean that M-Pesa might arguably diminish local spending power through the fees it charges.¹⁸⁵

There exist no in-depth studies of the impact of M-Pesa on local purchasing power. However, given that Safaricom is by far the most profitable company in Kenya and its shareholder structure is international, there is a strong prima facie case.

Due to hidden charges, fees, and other means of extracting revenue, tiny financial transactions via the M-Pesa network enabled its parent company, Safaricom, to become one of the world's most profitable companies. Even after the loss of significant revenues in 2019 due to the demise of sports betting, profits rose to a record-breaking USD 747 million in 2020.¹⁸⁶

“Early on, Safaricom began to pay out most of its profits as dividends to its mainly foreign shareholders; first to the UK’s Vodafone corporation with its majority 40% stake, and then to other wealthy shareholders who collectively own 25% of Safaricom. Since 2016, Safaricom has gone even further to reward its shareholders through a programme of ‘special’ dividend pay-outs.”¹⁸⁷

Milford Bateman, Professor of Economics at Pula University (Croatia) and Fernando Amorim Teixeira, Substitute Professor of Economics at the International Relations Institute of the Federal University of Rio de Janeiro

The critiques point out that M-Pesa revenues were generated from dubious subscription services being pushed onto the poor. Profits extracted from the poor were routed to international Safaricom shareholders and thus hampered the local value chain. This in turn obstructed local (re) investment and hence may have led to businesses exiting the country. The studies which detail the positive economic contribution of M-Pesa would then be unknowingly focusing on a kind of “canary in the coalmine”.¹⁸⁸ Further, problems such as over-indebtedness due to the extensive use of mobile money services would be largely neglected.¹⁸⁹ In contrast, local banking and the local reinvestment of locally-generated value played an important role in kick-starting lasting economic growth in Asia.

Another study, funded by USAID, concluded that poor and less technologically-educated customers of M-Pesa, who often struggle with impaired vision, were the target of unfair sales practices. These included non-transparent offers for ringtone subscriptions, which were in principle easy to cancel, but in practice it was very difficult to do so without help.¹⁹⁰ Even a study funded by the Gates Foundation made the criticism that the absence of sufficient competition led to high money transfer fees: roughly \$0.30 (US) for every \$1.50 sent with M-Pesa in Kenya. This was ten times higher than the charges by the same provider in Tanzania.¹⁹¹

6.1.2 M-Shwari: Digital Lending in Kenya

M-Pesa put mobile money on the map in Kenya. However, the expansion of savings and credit started with M-Shwari, a partnership between the Commercial Bank of Africa and Safaricom, which capitalized on the fact that competing credit services had not been permitted on M-Pesa until 2015.

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¹⁸⁴ W. Jack and T. Suri, “Mobile Money: The Economics of M-Pesa”, NBER Working Paper no. 16721, January 2011, pp. 1–31, available at <https://www.nber.org/papers/w16721>. Last accessed on 4 January 2023. ¹⁸⁵ Bateman et al., “Another False Messiah”. ¹⁸⁶ Bateman and Teixeira “The Promises and Perils of Investor-Driven Fintech”, p. 34. ¹⁸⁷ Ibid. ¹⁸⁸ The characterization of M-Pesa as being a “canary in the coal-mine” came from “Another False Messiah” by Bateman, Duvendack, and Loubere, in which they note the negative economic repercussions of the platform and how this might be a warning sign for further economic issues to come. ¹⁸⁹ Bateman et al., “Another False Messiah”. ¹⁹⁰ S. Wyche, N. Simiyu, and M. Othieno, “Mobile Phones as Amplifiers of Social Inequality Among Rural Kenyan Woman”, *ACM Transactions on Computer-Human Interaction*, vol. 23, no. 3, article 14, pp. 1–19. ¹⁹¹ R. Voorhies, J. Lamb, and M. Oxman, *Fighting Poverty Profitably: Transforming the Economics of Payments to Build Sustainable Inclusive Financial Systems*, Seattle (WA): Bill and Melinda Gates Foundation, 2013, p. 21, available at <https://docs.gatesfoundation.org/documents/fighting%20poverty%20profitably%20full%20report.pdf>. Last accessed on 4 January 2023. ¹⁹² S. Kariuki, “Digital Lending in Kenya – General Notes and Outlook”, *Frontier Fintech*, 15 March 2021, available at <https://frontierfintech.substack.com/p/digital-lending-in-kenya-general>. Last accessed on 4 January 2023.

The idea behind M-Shwari was to utilize the phone usage data of M-Pesa customers—such as transactions, airtime usage, and other data points—to estimate credit default risk. Further, it was observed that some customers used M-Pesa to store and save money in their accounts. This also inspired the Fuliza product which enabled overdrafts, as many transactions would fail due to having an insufficient balance at the time, although that balance might later be replenished.¹⁹² It became a part of everyday life in Kenya to say: “don’t pay me on M-Pesa” because they had Fuliza instead, and by contrast, payments made into M-Pesa accounts will be automatically deducted for the purposes of servicing debts.¹⁹³

The Central Bank of Kenya initially required each digital shilling in M-Pesa to be matched by a shilling in a commercial bank account owned by Safaricom. Hence, digital lending also became primarily anchored in banks.¹⁹⁴ The national FinAccess survey of Kenya also found the urban-rural divide in banking mirrored in financial access (including mobile money). Access ranges from 96 percent of the adult population in Nairobi to 57 percent in the rural Northern Rift Valley.¹⁹⁵

Credit is key to a credit-investment nexus and the purported benefits of mobile money. However, while in Kenya most individual loans are digital loans, in terms of total credit, loans are still dominated by banks.¹⁹⁶ Further, the urban-rural divide is particularly strong in the usage of digital lending services and apps.¹⁹⁷ Shopkeeper credit and digital lending have grown strongly in recent years in Kenya.¹⁹⁸ However, most credit is informal and the majority will be loans provided by relatives.¹⁹⁹

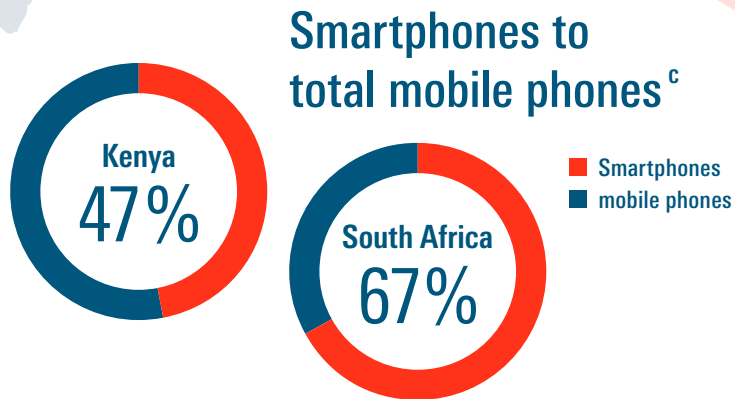
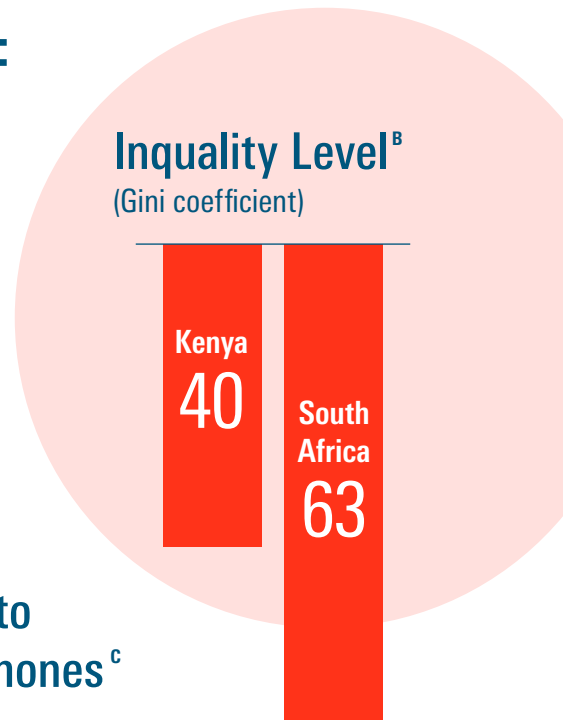
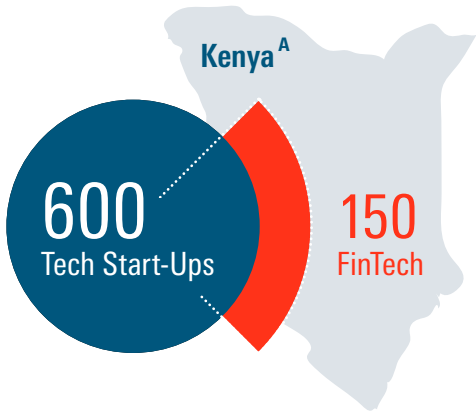
Many borrowers take on multiple loans (three on average among those using digital services) and the proportion of non-performing loans is higher with those provided through FinTech. Digital credit to a large extent serves daily consumption, hence the impact of FinTech on small-scale investment for productivity gains in agriculture is most likely very small. Concerns have recently grown about over-indebtedness facilitated by digital lenders.²⁰⁰

“The commercial success of Safaricom’s M-Shwari microcredit unit, which operates on the M-Pesa platform, began to attract a host of other fintechs hoping to cash in, such as Tala and Branch. With more than USD 50 million invested in fintech start-ups in Kenya since 2015, however, this created a need for new fintech lenders to generate as much as USD 500 million in order to pay back the venture capitalists. This pressure forced fintech lenders to expand as fast as they could and to take ever-increasing risks, plunging some of Kenya’s poorest citizens into a huge level of personal debt.”²⁰¹

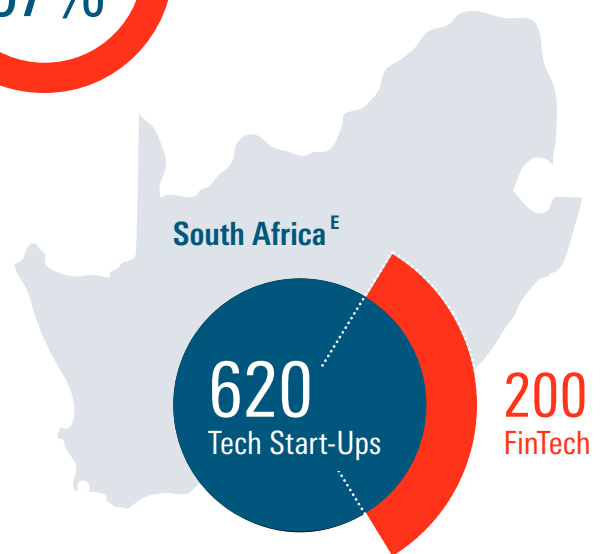
Milford Bateman, Professor of Economics at Pula University (Croatia) and Fernando Amorim Teixeira, Substitute Professor of Economics at the International Relations Institute of the Federal University of Rio de Janeiro

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¹⁹³ Ibid. ¹⁹⁴ Bernards, “Colonial Financial Infrastructures and Kenya’s Uneven Fintech Boom”, p. 720. ¹⁹⁵ Ibid., pp. 720–21. ¹⁹⁶ Microsave Consultancy, “Making Digital Credit Truly Responsible: Insights from analysis of digital credit in Kenya”, PowerPoint Presentation, September 2019, p. 21, available at <https://www.microsave.net/wp-content/uploads/2019/09/Digital-Credit-Kenya-Final-report.pdf>. Last accessed on 4 January 2023. ¹⁹⁷ Bernards, “Colonial Financial Infrastructures and Kenya’s Uneven Fintech Boom”, p. 721. ¹⁹⁸ Microsave Consultancy, “Making Digital Credit Truly Responsible”, p. 21. ¹⁹⁹ I. C. Sile and J. Bett “Determinants of Informal Finance Use in Kenya”, *Research Journal of Finance and Accounting*, vol. 6, no. 21, 2015, p. 7. ²⁰⁰ Bernards, “Colonial Financial Infrastructures and Kenya’s Uneven Fintech Boom”, p. 721. ²⁰¹ Bateman and Teixeira, “The Promises and Perils of Investor-Driven Fintech”, p. 26.

KENYA AND SOUTH AFRICA: FACTS AND FIGURES

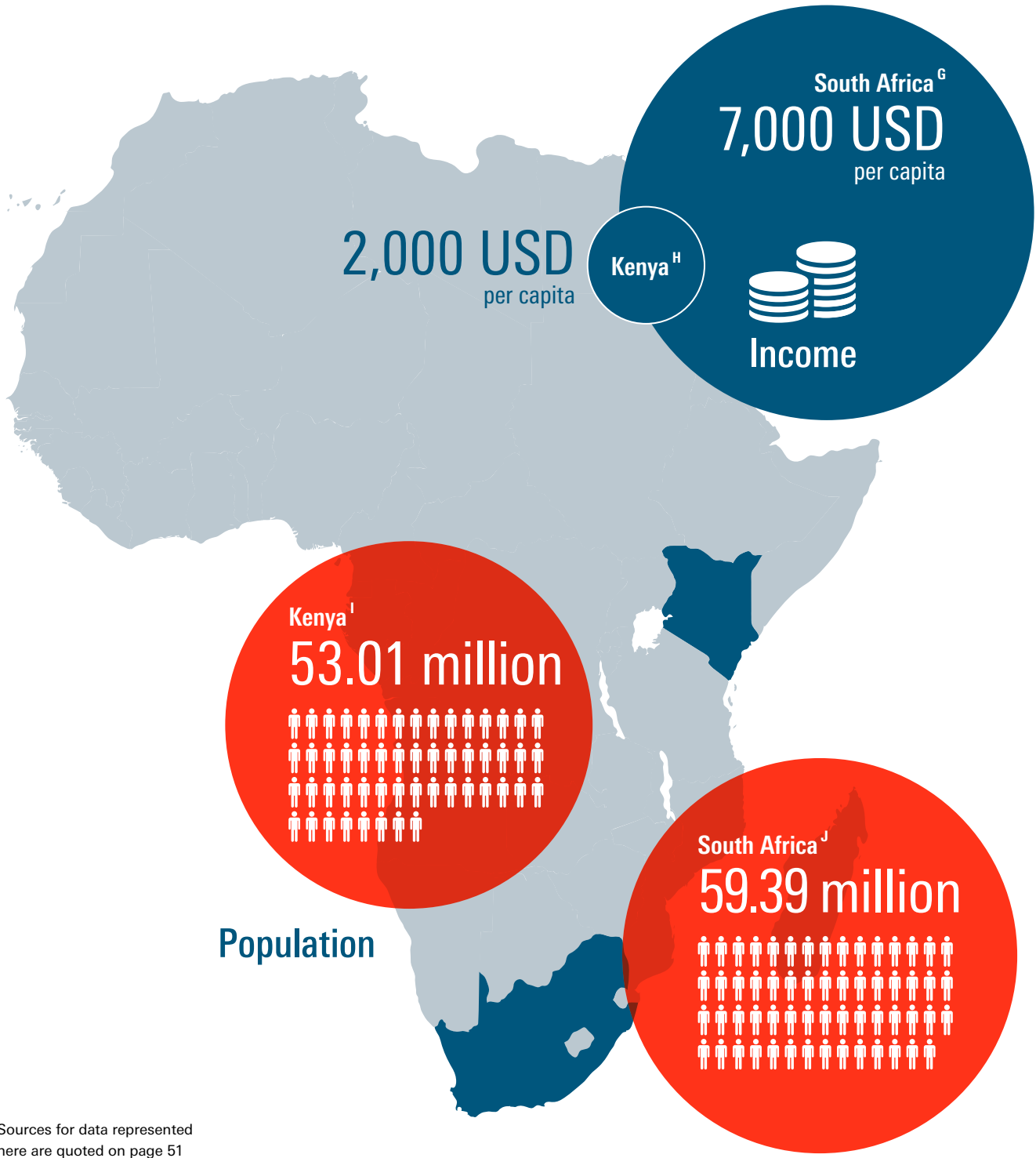


Share of population living under USD 2.15/day^D

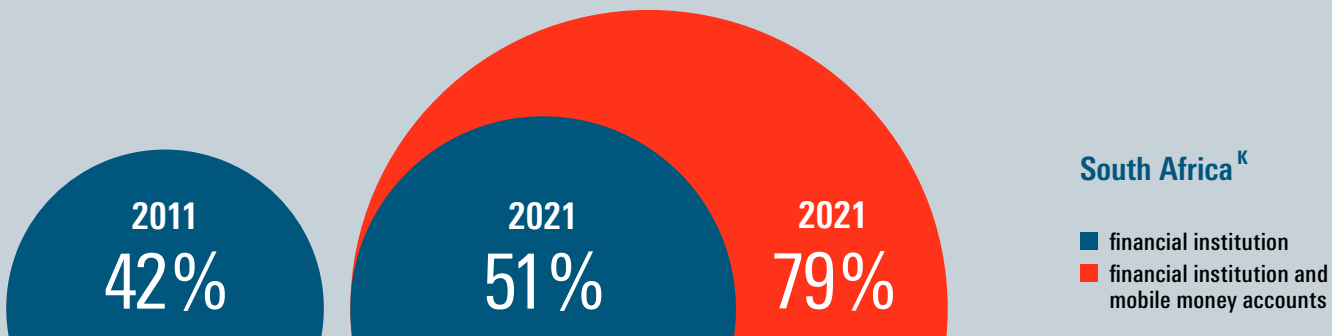


Account Ownership as Share of Adult Population





Sources for data represented here are quoted on page 51



Bateman and Teixeira blame the often extortionate interest rates charged by many FinTech companies for individual over-indebtedness in Kenya spiralling out of control, with “high multiple borrowing, high defaults, high non-performing loan (NPL) rates (defined as arrears of more than 90 days), growing numbers struggling to repay their loans and being forced to cut back on food, and the increasing numbers of clients forced to borrow more (including from local loan sharks) in order to repay their digital loan”.²⁰² In the mid-2010s even former proponents of FinTech and the industry itself pushed the Central Bank of Kenya for greater consumer protection amid unethical lending practices.²⁰³

Another area of great concern in Kenya was the provision of unlimited microcredit to young people to gamble on internet-based sports betting companies such as SportPesa, which was in 2018 the second-largest company by revenue in Kenya, after Safaricom.²⁰⁴ The Central Bank of Kenya initially advocated ‘light touch’ regulation, until Kenya was shook by young people falling into indebtedness, poverty, and eventually violence. The Kenyan government and the local business media (many reliant on Safaricom for advertising revenue) only reacted when it was revealed that SportPesa was not only using its revenues to sponsor wealthy English Premier League football clubs, but was actually moving the bulk of its profits abroad.²⁰⁵

Recently, regulations have been proposed to curb digital lending, as there has been a higher incidence of people defaulting on these loans.²⁰⁶ Regulators have also targeted serious data privacy breaches by digital lenders, who tried to recover loans via “debt shaming” (i.e. texting phone contacts of the debtor).²⁰⁷ Another area of concern has been the exorbitant interest rates of certain loans, which may exceed 100 percent per annum.²⁰⁸

Further, when it comes to FinTech, the political economist Nick Bernards argues that in Kenya it largely “replicates patterns of uneven development inherited from the colonial era”.²⁰⁹ FinTech usage would be heavily concentrated on Nairobi and Mombasa which corresponds with the patterns of settler-colonial agriculture. Bernards hence contests the widespread notion that FinTech would assist Kenya in “leapfrogging” the constraints of its financial system.²¹⁰

6.2 THE SOUTH AFRICAN FINTECH LANDSCAPE

South Africa has a population of 60 million people²¹¹ and as of 2021 had a GDP equivalent to USD 6994 per capita.²¹² South Africa is a highly financialized economy with a domestic credit to GDP ratio of 112 percent, of which however only half originates from the domestic banking sector.²¹³ Some research suggests that a ratio of domestic credit to GDP which exceeds 100 percent may lead to the over-financialization of an economy with ensuing negative growth effects.²¹⁴ According to estimates, South Africa is host to 620 tech startups, of which 200 are FinTech companies,²¹⁵ and it is also one of the most unequal societies in the world with a Gini coefficient of around 63 (based on data from 2014). Over 20 percent of the population lives on less than \$2.15 (US) a day.²¹⁶

In South Africa, account ownership at a financial institution has grown considerably since 2011, from 54 to 84 percent (if we include mobile money accounts the figure is only slightly higher, at 85 percent).²¹⁷ Roughly 70 percent of South Africans have internet access.²¹⁸ South Africa has a very high smartphone penetration rate compared to other Sub-Saharan countries. The percentage of smartphones among mobile phones in use is 67 per cent.²¹⁹ In South Africa, 68 percent of the population live in urban areas.²²⁰

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²⁰² Ibid., p. 27. ²⁰³ Ibid., p. 27. ²⁰⁴ Ibid., p. 28. ²⁰⁵ Ibid., p. 28. ²⁰⁶ Kariuki, “Digital Lending in Kenya”. ²⁰⁷ “Kenya outrage over debt collectors’ shaming tactics”, *BBC*, 5 August 2021, available at <https://www.bbc.com/news/world-africa-57985667>. Last accessed on 4 January 2023. ²⁰⁸ Kariuki, “Digital Lending in Kenya”. ²⁰⁹ Bernards, “Colonial Financial Infrastructures and Kenya’s Uneven Fintech Boom”, p. 708. ²¹⁰ Ibid., pp. 708–28. ²¹¹ “Population, total”, *World Bank*, 2022, available at <https://data.worldbank.org/indicator/SP.POP.TOTL>. Last accessed on 4 January 2023. ²¹² “GDP per capita (current US\$) – Kenya”, *World Bank*. ²¹³ “Domestic credit to private sector by banks (% of GDP) – South Africa”, *World Bank*, 2022, available at <https://data.worldbank.org/indicator/FD.AST.PRVT.GD.ZS?locations=ZA>. Last accessed on 4 January 2023. ²¹⁴ J. L. Arcand, E. Berkes, and U. Panizza, “Too much finance?” *Journal of Economic Growth* vol. 20, no. 2, pp. 105–48. ²¹⁵ R. Santosdiaz, “Fintech Landscape of South Africa 2022”, *FinTech Times*, 17 July 2022, available at <https://thefintechtimes.com/fintech-landscape-of-south-africa-2022/>. Last accessed on 4 January 2023. ²¹⁶ “South Africa”, *World Bank*, 2022, available at <https://data.worldbank.org/country/south-africa>. Last accessed on 4 January 2023. ²¹⁷ Demirgüç-Kunt et al., *The Global Findex Database 2021*. ²¹⁸ “Individuals using the Internet (% of population) – South Africa”, *World Bank*, 2022, available at <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=ZA>. Last accessed on 4 January 2023. ²¹⁹ “The Mobile Economy: Sub Saharan Africa 2022”, GSM Association, available at <https://www.gsma.com/mobileeconomy/wp-content/uploads/2022/10/The-Mobile-Economy-Sub-Saharan-Africa-2022.pdf>. Last accessed 13 February 2023. ²²⁰ “Urban population (% of total population) – South Africa”, *World Bank*, 2022, available at <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=ZA>. Last accessed on 4 January 2023.

Until the turn of the millennium, South Africa had largely been dominated by a banking cartel of four banks, reaching back to the colonial era of gold mining: Standard Bank, Absa, First National Bank (FNB), and Nedbank.²²¹ Even though the proportion of people with a bank account used to be higher in South Africa than in many other countries in the region, many accounts are infrequently used, as banks charge high fees for transactions. These four banks tended to ignore customer needs in South Africa's racially segregated and highly unequal society. With the turn of the millennium, Capitec challenged the 'big four' by offering lower-income households lower transaction fees.²²² Capitec also expanded into digital banking and now claims to have 16 million customers.²²³

However Capitec, which is owned by the Afrikaner financial elite of South Africa, has been criticized for unethical lending practices contributing to mass over-indebtedness of the poorest black communities. Subsequently, when "faced with increased financial and political risks, Capitec Bank announced in the late 2010s that it would exit the unsecured lending field (lending without collateral) and become a conventional mainstream bank supporting formal SMEs [small and medium enterprises] and wealthier South Africans".²²⁴

6.2.1 Behavioural Banking: TymeBank and Discovery Bank

In South Africa, mobile banking is less important than in Kenya and indeed M-Pesa never made a significant dent into the finance landscape.²²⁵ However, several digital banks are very active in South Africa, such as TymeBank (TYME, "take your money everywhere") and Discovery Bank which provides saving options.

When Capitec exited the risky business model of lending to poorer customers in South Africa, TymeBank sensed an opportunity to fill the market niche and to expand microcredit for poor black South Africans.²²⁶ TymeBank is a digital-only retail bank owned by South African billionaire Patrice Motsepe and which was developed originally as a Deloitte consulting project funded by the telecommunications provider MTN.²²⁷ With no branches and no paperwork required to sign up, TymeBank benefitted from lower transaction costs in the unsecured lending market than rival banks operating networks of physical branches. "By early 2021 TymeBank had 3 million customers, signing up 120,000 new customers a month".²²⁸

TymeBank partners with two important South African supermarket chains (Pick n Pay and Boxer) aiming for the mass market with its yellow card machines and "nearly 14,000 cash tills".²²⁹ TymeBank also features products such as health insurance, as it gains valuable data on people's lifestyles, one example being learning about a customer diet's through their shopping behaviour.²³⁰ TymeBank is further considering entering the loan market via business lending to small and medium-sized enterprises but so far only features BNPL products.²³¹ Hence, it is largely focused on consumer debt rather than financing investment and contributing to development.

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 221 C. Bröll, "Kontoeröffnung per Handy und kein Bargeld". 222 M. Hesse, "Capitec is cheapest for low- and middle-income earners", *IOL*, 11 December 2019, available at <https://www.iol.co.za/personal-finance/my-money/banking/capitec-is-cheapest-for-low-and-middle-income-earners-38980320>. Last accessed on 4 January 2023. 223 "How Capitec became South Africa's biggest digital bank", *Capitec*, 27 July 2022, available at <https://www.capitecbank.co.za/blog/articles/experiences/how-capitec-became-sas-biggest-digital-bank/>. Last accessed on 4 January 2023. 224 Bateman and Teixeira, "The Promises and Perils of Investor-Driven Fintech", p. 29. 225 L. Mbele, "Why M-Pesa failed in South Africa", *BBC*, 11 May 2016, available at <https://www.bbc.com/news/world-africa-36260348>. Last accessed on 4 January 2023. 226 Bateman and Teixeira, "The Promises and Perils of Investor-Driven Fintech", p. 29. 227 A. Changole, "Tycoon Patrice Motsepe's Investment Firm Switches to Banks, Shuns Mining", *Bloomberg*, 18 March 2022, available at <https://www.bloomberg.com/news/articles/2022-03-18/tycoon-motsepe-s-investment-firm-switches-to-banks-shuns-mining>. Last accessed on 4 January 2023. 228 Bateman and Teixeira, "The Promises and Perils of Investor-Driven Fintech", p. 29. 229 *Ibid.* 230 L. Buthelezi, "Weeks after launching a credit card, TymeBank is now into medical insurance", *news24*, 10 March 2022, available at <https://www.news24.com/fin24/companies/weeks-after-launching-a-credit-card-tymbank-is-now-into-medical-insurance-20220224>. Last accessed on 4 January 2023. 231 L. Buthelezi, "'We want to eat their lunch': TymeBank buys Retail Capital, expands to business lending", *news24*, 3 August 2022, available at <https://www.news24.com/fin24/companies/we-want-to-eat-their-lunch-tymbank-buys-retail-capital-expands-to-business-lending-20220803>. Last accessed on 4 January 2023.

“It is now easier than ever for the poor to obtain microcredit, encouraged by aggressive advertising, marketing tie-ups and other enticements for clients to access a microloan and immediately spend it in one of their retail outlets. In the process, it is also being made easier for Pick ’n Pay and Boxer to take valuable market share from the more than 100,000 small informal spaza shops traditionally owned and operated by the black community and which provide a major contribution to local food security, income generation and community solidarity and cohesion.”²³²

Milford Bateman, Professor of Economics at Pula University (Croatia) and Fernando Amorim Teixeira, Substitute Professor of Economics at the International Relations Institute of the Federal University of Rio de Janeiro

TymeBank claims to have a high exposure to a low-income female and rural customer base.²³³ An ID number and a mobile phone number is sufficient to open an account and be issued a debit card, while its services can be managed via an app or online.²³⁴ To add to the available functions of the account (such as exceeding a certain transaction limit), registration with a biometric picture and a residential address are required. This can be done at kiosks and enables the Financial Intelligence Centre of South Africa (FIC) to conduct fraud checks.²³⁵

Discovery Bank is part of Discovery Corporation, which is the biggest supplier of health and other insurance products in South Africa. Discovery is focused on the middle class and tries to incentivize financial behaviour such as saving and investing in pension products via a bonus system. It is modelled after the corporation’s insurance programme, Discovery Vitality, where for example frequenting a gym leads to better insurance conditions or discounts on consumer goods, such as coffee or rental cars. Discovery claims to be South Africa’s first “behavioural bank”.²³⁶

6.2.2 Jumo: Enabling “Poverty Credit”

Jumo is a Cape Town-based FinTech company, initially founded in London. It has entered partnerships with telecommunication companies and banks to enable unsecured credit products across different African countries,²³⁷ such as QwikLoan in Ghana or Kasaka Loans in Zambia.²³⁸ It is hence not only focused on the South African market. Jumo uses software called Apache Spark to run algorithms based on data from mobile phone customers (such as contract history, airtime purchasing patterns, and voice, SMS, and geo-location data) with transactional data points on mobile payments.²³⁹

Jumo acts as a middle-man between sellers and buyers of financial products, a so-called aggregator platform. For instance, Jumo was involved in developing credit scores for companies offering car loans to Uber drivers based on their earnings, tips, and behaviour e.g. their driving style.²⁴⁰ They also for instance attempt to calculate the fraud risk of borrowers in Ghana with algorithms analysing data points such as income size and deposit frequency, but also the usage of the mobile phone battery (how long the phone was off or how often users let their battery die).²⁴¹

Hence, Jumo with its cloud and AI-powered technology stack connects banks with formerly unbanked customers and enables them to profit from customers via fees and interest payments²⁴² in a cost-effective manner.²⁴³ Research into similar loan products in Kenya (such as M-Shwari) found that most of these “nano-loans” are for regular personal consumption but that they can lead to perpetual indebtedness as they are constantly rolled over.²⁴⁴ In other words, those loans do not support a credit-investment nexus but extract purchasing power from private households as they accumulate debts through high interest rates.

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²³² Bateman and Teixeira, “The Promises and Perils of Investor-Driven Fintech”, p. 29. ²³³ Ivo Jenik, *TymeBank Case Study: The Customer Impact of Inclusive Digital Banking*, CGAP, 2022, available at <https://www.cgap.org/research/publication/tymbank-case-study-customer-impact-inclusive-digital-banking>. Last accessed on 4 January 2023. ²³⁴ C. Bröll, “Kontoeröffnung per Handy und kein Bargeld”. ²³⁵ “TymeBank – everything you need to know about South Africa’s first digital-only bank”, *Business Tech*, 12 November 2018, available at <https://businesstech.co.za/news/banking/283534/tymbank-everything-you-need-to-know-about-south-africas-first-digital-only-bank/>. Last accessed on 4 January 2023. ²³⁶ A behavioural bank uses behavioural data (such as for example whether you eat healthily or have a gym subscription). In the words of Discovery’s own website, this entails “encouraging customers to be financially healthy and rewarding them for their efforts through its Vitality Money rewards program”. See also C. Bröll, “Kontoeröffnung per Handy und kein Bargeld”. ²³⁷ Langley and Leyshon, “Neo-colonial credit”, p. 402. ²³⁸ Ibid., p. 408. ²³⁹ Ibid., p. 409. ²⁴⁰ Ibid., p. 405. ²⁴¹ Ibid., p. 410. ²⁴² In the case of QwikLoan in Ghana, loans of up to USD 250 can be obtained and repaid anytime within 30 days against a 6.9 percent loan facilitation fee. However, if the debt is repaid after 30 days, the annual percentage rate of these loans rises to 83.95 percent and late fees of over 12 percent of the loan amount accrue. See Langley and Leyshon, “Neo-colonial credit”, p. 409. ²⁴³ Ibid., pp. 407–08. ²⁴⁴ Ibid., p. 409.

THE SOCIAL GRANT PROGRAMME AND FINTECH IN SOUTH AFRICA

This is an abridged version of a text from Bateman and Teixeira's "The Promises and Perils of Investor-Driven Fintech", p. 36.

Some international development organizations encouraged the South African government to disburse social grants through the private FinTech platform Cash Paymaster Services (CPS) as this would save costs and result in financial inclusion for unbanked grant recipients.²⁴⁵ CPS was a subsidiary of the US-based FinTech platform Net1 Technologies (Net1), and it was granted the right to register these social grant beneficiaries in their platform, collect their biometric data, and open over 10 million new bank accounts on their behalf. Shortly after, CPS began to flood its customers with SMS advertisements offering mobile phone airtime, electricity, insurance, and microcredit offers. Many clients were soon plunged into deep debt. The social grant was then turned into a form of collateral that lenders in the country could possess if the clients agreed to take out a new microloan.²⁴⁶ The government finally phased out Net1's contract. The grant system was subsequently taken over by the state-owned South African Post Office (SAPO) which ended many of the exploitative commercial activities, and the service continued to operate efficiently in public hands. Later South Africa's Constitutional Court declared that a large part of the profits CPS generated under its contract with the government had to be repaid. Hence, Net1 took the decision to liquidate its CPS unit.²⁴⁷

6.3 SOME STYLIZED FACTS ABOUT FINTECH IN KENYA AND SOUTH AFRICA

FinTech in Kenya is deeply linked to mobile money and feature phones. In Kenya mobile money has helped to include unbanked people in a low-level monetary circuit. However, the claim that mobile money would contribute significantly to poverty reduction is highly questionable at best, as I shall explain:

Firstly, FinTech platforms such as Safaricom's M-Pesa network appear to extract huge revenues and hence purchasing power from the local population. These revenues are then primarily redistributed to international shareholders. Secondly, there is no empirical evidence of a meaningful contribution to a credit-investment nexus, for example a boost to agricultural productivity or income, as most credit is consumer credit rather than supporting small-scale business investment. Thirdly, financial access is still highly concentrated on the urban areas, replicating the patterns of colonial banking. Fourthly, over-indebtedness is on the rise among poorer communities.

Hence, while there is clearly a public use case for mobile money in a country with low access to financial infrastructure in rural areas, there are also good reasons not to rely solely on private profit-maximizing firms. As telecommunication licenses were usually issued by the state and M-Pesa was a PPP, mobile money technologies could have theoretically also been offered as part of the public infrastructure, rather

than through private enterprise, whose profit-maximization practices lead to more aggressive extraction of revenues from the poor. Alternatively, interest rates or other service fees could have been regulated more tightly.

The data however suggests that in Kenya the hurdles to obtain short-term emergency credit are lower than in South Africa. The proportion of the adult population (those aged 25 and up) that struggle to obtain additional funds for unforeseen expenses within the following 30 days was only 6 percent in Kenya in 2021, compared with 25 percent in South Africa. The patterns are replicated when looking at the poorest 40 percent of the population. Here the proportion of people who struggle to acquire short-term emergency loans stands at 11 percent in Kenya, and 37 percent in South Africa. For the rural population this share is reported as 6 percent in Kenya (which is identical to the urban population), and 33 percent in South Africa.²⁴⁸

The greater access to short term emergency loans could for instance also reflect factors such as a different exposure of the countries to economic shocks during the coronavirus

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²⁴⁵ Ibid. ²⁴⁶ Ibid. ²⁴⁷ Ibid. ²⁴⁸ These figures are based on the Findex "Data Dashboard", available at <https://www.worldbank.org/en/publication/globalfindex/Data>. Last accessed on 24 January 2023.

pandemic or greater need to react to economic distress. The lower urbanization rates of Kenya (28 percent) when compared to South Africa (68 percent) cannot explain those differences, as in South Africa the share of people with lack of access to emergency loans is higher in rural areas than in urban areas.²⁴⁹

Hence, it is possible that mobile money contributed to shifting balances around within interpersonal networks and hence softened the impact of short-term liquidity problems for individuals. However, more extensive data over a longer time period is needed to draw conclusions with greater confidence. It should however be kept in mind that obtaining emergency funds through mobile money is not the same as improving the financial situation of private households on a sustained basis.

In South Africa, financial inclusion is comparatively advanced. FinTech is concentrated on digital banking both for the middle class as well as consumer credit for low-income households via behavioural data mining (such as predicting health risks from liquor purchases). However, research on Sub-Saharan FinTech loan products suggests that the bulk of credit demand is for personal consumption rather than business investment.

In both these FinTech markets, data mining in finance is quite extensive and regulators struggle to curb questionable practices such as retrieving phone contacts to debt-shame borrowers through directly messaging their personal contacts. Credit scores are developed based on behavioural patterns such as driving style or mobile phone battery usage. Hence, stricter data protection frameworks are needed.

The impact of notable Big Tech companies in the finance sector in Africa is still limited, as companies such as Apple focus on developed markets and consumers that carry less risk. Apple's customer base and hence data penetration is higher in its core markets. Further, their business model requires smartphone use, as opposed to simple feature phones.

However, as African markets are highly profitable, smartphone penetration is on the rise and the tech sector is currently exposed to a funding squeeze due to monetary tightening by central banks, thus further market concentration should be expected. Big Tech companies from abroad are slowly but surely moving into African payment markets, for instance with Google Pay seeking local partners in Nigeria.²⁵⁰

"Homegrown" FinTech platforms such as M-Pesa have to a certain extent transformed parent companies such as Safaricom into Big Tech, as the telecommunication company now cuts across different markets (telecommunications, banking, etc.). Most loan facilitation by FinTech is linked to partner banks, and this may become a risk factor to financial stability with growth in the overall FinTech sector and "lump risk" (as most FinTech is concentrated on certain regional markets or customer bases). Where FinTech platforms provide loans via their own balance sheets it is often linked to schemes such as BNPL which still have limited feedback to the banking sector and hence also carry limited risk of contagion.

However, as private over-indebtedness is on the rise with exorbitant interest rates and more high-risk customers being integrated into the money web, financial stability concerns could soon arise given that FinTech firms are growing in size and are often not regulated to the same extent as the banks (i.e. without specific capital requirements).

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²⁴⁹ Ibid. ²⁵⁰ E. Daniel "Flutterwave enables Google Pay for African businesses", *The Guardian Nigeria*, 22 September 2022, available at <https://guardian.ng/business-services/flutterwave-enables-google-pay-for-african-businesses/>. Last accessed on 4 January 2023.

7 HOW TO CONFRONT THE POWER OF BIG DATA IN AFRICA?

Let us finally look at options for African countries to react to the dangers of losing data and economic sovereignty to FinTech.

Data Protection and public ownership: African regulators could design and enforce stricter data protection laws requiring, for instance, the separation of certain data. Further, the storage of data under public supervision could be enforced, in addition to greater transparency on the construction and use of algorithms (including an option for regulators to enforce adjustments of algorithms). This might however require nationalization of certain telecommunications operators.

Another option would be to declare data as a public good and force Big Tech and other companies to compensate data owners or the state for the use of data and to include the use of data in international trade talks, for example with the World Trade Organization (WTO). However, data protection is always difficult to enforce as there exist information asymmetries between the companies that collect data, and the technological capacities of regulators. Further, as concern for data protection ranks low on the agenda in countries with urgent social needs, and mistrust in state institutions is high, the potential for data protection in Africa currently seems limited.

Antitrust policies, regulation of FinTech, and taxing data profits: antitrust policies could enforce the breakup of entities which have accumulated too much data and financial power. While the feedback between FinTech and the credit system is still low, some FinTech companies have begun to rely increasingly on funding from banks or other financial institutions. Further, customer funds held by non-banks may be at risk if unprotected. Interest rate caps are also important to protect against over-indebtedness and exploitative lending practices. Regulatory measures such as capital requirements and deposit insurance for FinTech, as well as provisions governing the reinvestment of profits and customer funds, should be considered by national financial regulators and central banks.²⁵¹

Further, Big Tech and other companies with significant market power could be refused licenses to offer financial services within the jurisdiction of African countries. Another option could be to tax, at their source, profits which were made using a population's data. That would require forcing companies that operate in Africa to report profits, turnover, and other key indicators per country (country-by-country reporting) and then tax them accordingly (for example if a certain share of global turnover from a FinTech company is made within an African country the tax authorities could claim an equivalent share of profits according to a

specific formula). Such initiatives could be supported on a technical level by the United Nations (e.g. United Nations Conference on Trade and Development [UNCTAD]) rather than international groups such as the Organization for Economic Co-operation and Development (OECD), which are heavily dominated by Western governments.

Cash protection and central bank digital currency: finally, the right to make small cash payments and to ensure cash distribution in rural areas should be ensured. Otherwise, poor people become vulnerable and too dependent on large corporations and their attempts to monetize even basic public goods such as water or health. Central banks should also embark on using mobile technology for central bank digital currency (CBDC) and allow such transactions to be made cheaply. This could include retail CBDC with accounts of retail customers directly at the central bank allowing them to hold and move digital central bank reserves with stricter data protection laws than with private FinTech companies.

The central bank could also offer preferential loans for small businesses via CBDC. However, this would be within strictly-defined limits as otherwise the central bank would be assuming the role of loan intermediation and hence competing with commercial banks. Further, it could provide basic datasets for legitimate use only (for example no granular behavioural data, but instead more conventional data on income and credit default risks) upon the request of financial corporations, and could also charge them fees. Hence, data would be under public ownership and sold to private entities. This is similar to a tax on data mining. It would also enable the central bank to allocate data to specific firms and hence to limit data monopolies. It is often argued that CBDC bears the risk of digital bank runs (customers shifting their deposits at commercial banks to central banks because, unlike commercial banks, a central bank can never go bankrupt in its own currency). In order to prevent this, there could be legislation to set a cap on deposits, or that deposits should be interest-free (which would incentivize commercial banks to offer better conditions to savers than the central bank).

A common response to such proposals is often that public enterprise has been discredited in countries such as South Africa due to state capture. That is undoubtedly true. However, state capture and political cronyism have also occurred in large private enterprises. Ethnic divisions and high levels of income inequality with a high concentration

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²⁵¹ Sy et al., "FinTech in Sub-Saharan African Countries: A Game Changer?", p. 33.

of economic and political power are often seen as catalysts for corruption and profiteering by political factions. However, post-colonial Botswana or formerly low or middle income countries in Eastern Asia (albeit often with more autocratic rule) have demonstrated how to manage public enterprise in an efficient manner. Further, for instance the public-private South African Reserve Bank (SARB) has rarely been accused of corruption. South Africa also had periods where the independent and efficient South African Revenue Service (SARS) or anti-corruption units such as the Scorpions (which no longer exist) were feared by politicians and corrupt businessmen alike. That is exactly the reason former South African President Jacob Zuma tried to seize control of those public units.²⁵²

Lastly, what is the alternative? There is no reason why corruption and mismanagement should not occur in large oligopolistic private corporations, which in both South Africa and Kenya have strong ties with political elites. Hence, public entities may be very prone to corruption in South Africa, but this can be changed politically by design. With private enterprise that is much harder to do, and even if private companies are sometimes run more efficiently as they are governed by the profit motive, it is the very profit motive that stands in the way of correcting the already large market and data power of private corporations. Ultimately, better public policies are only attainable if there is more public debate and pressure around those issues.

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²⁵² K. Dlamini, "Scorpions' Downfall Due to Political Interference", *Corruption Watch*, 10 October 2018, available at <https://www.corruptionwatch.org.za/political-interference-in-south-africas-elite-anti-corruption-unit-leads-to-impunity/>. Last accessed on 12 January 2023. ²⁵³ Robin Hood is a neobroker that allows individuals to take part in stock trading via an app.

INTERVIEW WITH PROF. CO-PIERRE GEORG

Co-Pierre Georg is an Associate Professor at the University of Cape Town, is Director of the Algorand-UCT Innovation Hub, and holds the position of Research Chair in Financial Stability Studies at the South African Reserve Bank.

Question: What is your broader view on data-driven business models? Is FinTech always and everywhere the key to the financial inclusion of underbanked people or do we need to secure access to cash as well for people in the informal economy? Is financial technology even accessible to people with poor access to the internet and electricity?

Answer: This question really has two parts, I'll answer them separately: a big part of today's data-driven business models is based on the expropriation of data and users' inability to control data once they have shared it. While General Data Protection Regulation [GDPR] and other legislation tries to curb the unauthorized use of data, it is way too easy for companies to get around that by hiding how exactly they plan to use data in lengthy end user license agreements. Consequently, users have no real control over what happens with their data and companies like Robin Hood²⁵³ that, for example, sell user data to third parties who then come in and take opposing positions in trades, affecting the price of a stock a user wants to buy. This has significant welfare effects on a larger scale and is a consequence of the way in which our existing data infrastructure was created.

I don't think FinTech is a panacea for financial inclusion. Most people who are un- or underbanked also do not have a smartphone. The vast majority of FinTech companies use apps to deliver their services, excluding more than half of the world's population. Those companies who offer services for feature phones often employ other predatory practices. M-Pesa, for example, which is often hailed as a success story, uses the same franchising model that McDonald's uses to offload risk to M-Pesa agents who have to handle large amounts of cash and have no effective way of curbing the spread of counterfeit money. I don't think cash is the right solution either, though, because it is wildly expensive, impractical, and creates huge security risks. While there are some new technologies on the horizon that could help solve both digital and financial inclusion at the same time, more efforts are necessary to bring these from research into practice.

Q: Which dangers do you see currently when Big Tech and Big Data meet FinTech (i.e. Facebook's initial attempt to establish a stablecoin tied to a currency basket)? Is there risk of a company being too big to fail, and excessive market and data power?

A: My main concern with Big Tech companies moving into finance is that Big Tech has amassed a gigantic data advantage over traditional financial institutions. This data advantage will make it possible for them to solve frictions in financial markets (asymmetric information, adverse selection, moral hazard) cheaper and more efficiently than traditional financial institutions. While this is great in principle, the problem is that Big Tech companies are insufficiently regulated. And the trend towards unbundling of financial services also means that new players will be able to create a bank-like experience without having a banking license, which means that we will have an uneven playing field that, in my opinion, will lead to significant risks to consumer protection and financial stability.

Q: What is your take on central bank digital currencies and how should they be designed in your view (retail/wholesale CBDC)?

A: The provision of cash is widely understood to be a public utility and as such organized by central bank and treasury. With the advent of the digital economy, which is on the rise in Africa as well as everywhere in the world, we are now seeing demand for digital means of payments. However, due to the existing frictions in correspondent banking, the traditional financial system has not managed to provide effective means of ultra-low-cost digital payments. Consequently, there is a demand for alternatives which is currently being satisfied only by the private sector. But I would argue that digital retail payments, just like cash or digital wholesale payments, are a public utility and should be provided by the public sector. In the interest of competitiveness and innovation, we should also allow private solutions, but a publicly provided means of digital payments can ensure that costs will not exceed a certain threshold while maintaining a high quality of service. Therefore I think we need CBDCs.

When it comes to the design of CBDCs, I think we should follow the model of the internet, which is a highly interoperable network of networks that was designed to prevent walled gardens. Currently, I see a tendency towards centralized payment solutions that are not interoperable with one another. This creates walled gardens where competition is based on locking in users and capturing value within the walls of the garden rather than by innovation.

Q: What is your take on crypto assets? Do they serve a purpose or would you associate them rather with Ponzi schemes?

A: I think crypto assets have shown that they can be an engine for innovation. Much of that has to do with the lack of regulation in the early days, but this also raises significant risks for consumers. I don't think the term "Ponzi scheme" is fully appropriate because there are many crypto assets that facilitate use cases with fundamental value to consumers—which Ponzi schemes do not.

Q: Critics argue that blockchain has yet to demonstrate its use case and the inherent problem would be proof of work. The blockchain as used in Bitcoin for example is being used to validate transactions while it could be argued that of all the things banks do poorly, proper double entry bookkeeping is not an issue to be concerned with. Others argue blockchain could also play a role in financial supervision etc. Where do you stand?

A: When the internet was created, it also took a long time before it demonstrated its (commercial) use. Blockchain is a new kind of infrastructure for innovative services. I think that asset tokenization has proven to be a powerful use case for blockchain because it eliminates many frictions in the traditional securitization scheme where origination, distribution, trading, clearing, settlement, safekeeping all happen in separate institutions instead of a horizontally and vertically integrated system. Blockchain is the infrastructure for such a system. Another key use case in my opinion is to ensure provenance of data. Once I register a piece of data on a blockchain, I can create ownership claims and as long as it cannot be double-spent, nobody can create a copy with the same provenance. This is valuable as the foundation of property rights for the digital economy. With that being said, I am very sceptical of PoW²⁵⁴ because of the energy consumption. We have much more efficient ways to ensure the consistency of the ledger and I think it's a useful direction to go into.

Q: What are the biggest challenges in your view in regulating FinTech and crypto in South Africa or other important FinTech hubs such as Kenya or Nigeria?

A: The main challenge is the rapidly changing nature of FinTech companies. This poses a great challenge for regulators who are trying to reconcile a regulatory environment designed to regulate (financial) institutions to a world that consists of interconnected platforms rather than institutions. There are other issues, for example with the skills that regulators can draw upon. The private sector pays much more than the public sector and therefore many of our smartest young people go into the private sector. This creates a skills gap between regulators and industry. Third, there is not yet an established industry body to engage with because the industry itself changes so quickly. And, lastly, many FinTech companies are simply beyond the purview of financial regulation because they simply don't fit into the existing scheme. This is particularly true for Big Tech companies as they enter financial services.

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²⁵⁴ PoW stands for proof of work, and "describes a system that requires a not-insignificant but feasible amount of effort in order to deter frivolous or malicious uses of computing power, such as sending spam emails or launching denial of service attacks". See J. Frankenfield, "What Is Proof of Work (PoW) in Blockchain?", *Investopedia*, 2 May 2022, available at <https://www.investopedia.com/terms/p/proof-work.asp>. Last accessed on 4 January 2023.

8 CONCLUSION

The impact of international Big Tech in Africa is still limited. However, companies such as Google Pay are starting to develop partnerships with regional FinTech firms, and “homegrown” FinTech platforms such as M-Pesa have made companies such as Safaricom the most profitable in the region. As African FinTech and banking is so profitable due to high tariffs and fees, and the economics of Big Data favours big firms, Big Tech investment in Africa is likely to increase.

In Kenya, FinTech has been spread through the M-Pesa network, capitalizing on the common practice of feature phone users shifting airtime balances to each other and is hence deeply rooted in the spread of mobile communication. At the same time, smartphone penetration is on the rise in Africa, further facilitating Big Tech firms from the Global North importing their business models to Africa.

Kenya and South Africa saw a rise of important players in Big Data and behavioural banking such as M-Pesa, TymeBank, Jumo, and others. While mobile money contributed to financial access for the unbanked population in Kenya, it is still concentrated on urban areas and the providers produce revenues through charging exorbitant fees to poor people, revenues which are not sufficiently reinvested back into the country, but rather channelled to international shareholders. The patterns of colonial banking are often replicated and basic services such as clean water and health are increasingly being financialized via mobile money.

Mobile money finances consumer debt rather than sustaining investment into the productive capacity of previously unbanked people. In South Africa, behavioural banking has advanced but with little impact on a credit-investment nexus. Hence, the financial inclusion story of many developmental organizations seems premature and risks a takeover of developmental aid by corporate interests.

Most loan facilitation by FinTech is linked to partner banks which may become a risk to financial stability when the sector—and with it consumer debt—grows. Where FinTech firms provide loans via their balance sheets it is however often linked to schemes such as BNPL which still have limited feedback to the banking sector and hence also carry limited risk of financial contagion. However, private over-indebtedness is on the rise with exorbitant interest rates already causing tremendous economic and social stress. As more high-risk customers are being integrated into the money web this development will most likely become more aggravated.

Data technology also provides opportunities to facilitate economic participation and access to financial infrastructure. Many would argue that it is reasonable to use data to inform financial decisions. The increasing capacity of phone technology and its role in our economic life is a development that will most likely persist. Hence, the political challenge is not to fight FinTech but to embed FinTech in a socially productive way.

African countries should hence strengthen data protection and public ownership in the telecommunications sector as well as enforce antitrust legislation and regulate FinTech at least to a similar extent as the banks. Another option could be to tax local data mining. Further, cash payments for smaller transactions should be protected and central bank digital currency considered as a means of offering financial technology as a public good.

In conclusion, many African societies face the risk of digital colonialism and negative social and economic ramifications through conquest by FinTech and Big Data firms. While Africa cannot—and should not—escape digital technologies, it should however soon find ways to regulate and control these new financial players in order to safeguard financial and digital sovereignty.

GLOSSARY

Algorithm

In computer science, an algorithm is a sequence of instructions, typically used to perform a computation. Algorithms are used to extract patterns in large datasets and deduce behaviour or statistical relationships between variables. Algorithms are also used to influence behaviour, such as with targeted advertising based on observed interests and the keyword searches of internet users.

Asymmetry of information

Information asymmetry is “an imbalance between two parties in their knowledge ... of relevant details. Typically, that imbalance means that the side with more information enjoys an advantage over the other party”.²⁵⁵ In finance there exist information asymmetries between lenders and borrowers, with the latter sometimes not revealing their true risk of credit default. Accordingly, ‘bad’ borrowers would be willing to borrow at high interest rates thus driving out good lenders and contributing to unnecessarily high borrowing costs as lenders set higher interest rates to compensate for risk.

Adverse selection

Adverse selection refers to a situation in which “sellers have information that buyers do not have, or vice versa, about some aspect of product quality”. In other words, it is a case where asymmetric information is exploited. In the case of insurance, adverse selection is seen in the increased incidence of life insurance policies among those often exposed to high risk (in their work or social lives). “To fight adverse selection, insurance companies reduce exposure to large claims by limiting coverage or raising premiums” thus often driving out the so-called ‘good’ customers.²⁵⁶

Big Data companies

Companies that work with Big Data sets (but not necessarily big companies).

Big Finance (companies)

Big banks or other financial institutions with a large customer base or assets (but not necessarily companies with extensive data mining).

Big Tech (companies)

Corporations that usually work with Big Data sets whether in communications, software, finance, or any other relevant sector. They usually offer services across a wide spectrum of markets.

Central bank digital currency (CBDC)

Digital money for private households and/or firms held at or guaranteed by the central bank instead of commercial banks. It is usually distinguished between retail and wholesale CBDC. Retail CBDC refers to central bank currency for private households and businesses while wholesale CBDC is confined to business-to-business transactions.

Data Mining

Data mining is the process of gathering and analysing data in order to detect patterns and correlations, as well as to predict outcomes—often with the intention of monetizing that information.

Diem

Stablecoin launched by Facebook/Meta, and tied to the US dollar. It was to some degree a rebranding of Libra, albeit with modifications and less ambitious in scope, but failed to become popular and the business was sold off in 2022.

FinTech

Companies or platforms that work with Big Data or technology in finance but are not necessarily Big Tech or Big Finance companies.

Libra

Facebook’s initial concept for a stablecoin, envisaged as being tied to a basket of major currencies and with the option to adjust the currency mix.

Metaverse

The metaverse is a concept which originated in science fiction but has more recently been talked about regarding a vision for an integrated internet which makes use of augmented or virtual reality, and in which all kinds of social or business interactions can take place.

Mobile money

Digital balances comprising money, or other valuable transferrable assets such as airtime, where transactions can be made via phones (e.g. via SMS).

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²⁵⁵ I. Wigmore, “information asymmetry”, *Techtarget*, May 2016, available at <https://www.techtarget.com/whatis/definition/information-asymmetry>. Last accessed on 4 January 2023. ²⁵⁶ See A. Hayes, “Adverse Selection: Definition, How It Works, and The Lemons Problem”, *Investopedia*, 15 September 2022, available at <https://www.investopedia.com/terms/a/adverseselection.asp>. Last accessed on 4 January 2023.

Monopoly & oligopoly

Economists broadly distinguish between monopolies (individual companies that exercise exclusive control over a service, commodity, or industry within a market) and oligopolies (a limited number of powerful sellers or producers within a market).

Platform economy

The platform economy describes the facilitation of economic or other services via a website or app framework, in which a network of users can make use of, or provide, these services. It is currently dominated by corporations such as Amazon, Uber, Alphabet/Google, or Alibaba, and is a sector in which data mining is prevalent.

Shadow banks

Financial institutions which look and behave similarly to banks, but are not subject to the same regulatory oversight, and who equally may not be supported by the central bank in the case of emergencies or financial crises.

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