

# Cashing In on Cashless: Different Pathways to Cashless Payments in the Global South



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## 1 Introduction

The last decade has seen a massive wave of financial inclusion. In 2011, 51% of the world's population (aged over 15) had an account at a financial institution. By 2021, just 10 years later, 74% of the world's population had an account, an increase of almost 50% (World, 2024, Global Findex Database). The increase in account ownership occurred predominantly in the global south and it was mainly driven by digital providers outside the financial sector—cell phone companies in sub-Saharan Africa and the gaming industry in East Asia. The dimensions of this process should not be underestimated. For example, China was a heavily cash-based economy only 10 years ago, although it suffered from limited availability of coins and banknotes in rural areas. By 2023, nearly 88% of Chinese used mobile payment options regularly (Chorzempa, 2022). The same is true for many sub-Saharan African countries, such as Kenya. By 2021, almost 80% of the Kenyan population had a money account with a mobile money provider or financial institution, an increase of more than 100% compared to 2011, when only 40% of Kenyans had an account. This trend implies a dramatic increase in the availability of financial services, including money transfers or access to credit, which is linked to the advancement of digital technologies.

While no one can deny that the rise of financial services and the advance of digital payments have improved many people's lives, they have also opened the door to new sources of social inequality, which are still largely understudied. The reasons behind our lack of knowledge are several. On the one hand, the speed with which technological changes occur makes it challenging to have sufficiently updated knowledge. Another important reason is that there is no consensus regarding the effects of this wave of financial inclusion. On the one hand, researchers from

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development agencies and international organizations—such as the World Bank, the IMF, or the BIS—have argued that the ‘banking of the unbanked’ is fostering development and bringing benefits to those previously excluded from formal financial services (Barajas et al., 2020). In their vision, digitalization is increasing economic opportunities for many disadvantaged communities. Digital payments, specifically, made it possible to offer easier, faster, and frictionless payments, thus providing options to those who previously had none. They fostered access to credit and markets, increased users’ autonomy and decision-making capacity, reduced system costs, and increased transparency and accountability. In contrast, for academics linked to universities, the rise of digital finance has had negative consequences. Not only did it facilitate the advance of ‘financialization’ (van der Zwan, 2014), and the subjugation of the lower socioeconomic classes and populations of the global south to the logic of global financial markets. In addition, digitalization allowed corporations to extract more and more profits, thus increasing indebtedness and fostering new forms of exclusion (Aitken, 2017; Bernards, 2019, 2021; Dafe, 2020; Gabor & Brooks, 2017; Langlely & Leyshon, 2022).

Without denying both realities, our objective in this article is to have a closer look at the social transformations caused by the rise of digital finance in the global south. In particular, we analyze the effects of the transition toward a cashless society on the dynamics of social inequality. Before the rise of digital technologies, social inequalities manifested in the lack of access to financial services for large segments of the population. However, this changed when digital technologies allowed large, previously excluded groups massive access to formal financial services. But, although digitalization succeeded in reducing the problems associated with lack of access to financial services, it engendered new forms of social inequality. In this paper, we analyze two central mechanisms of this process. First, we study how the advance of cashless payments made it possible to link the payment act with access to consumer credit (Brandl et al., 2024). The entanglement of payment and credit provided a massive source of revenue for cashless payment providers and gave rise to an entire industry: the payments industry. But this alliance, so beneficial for payment providers, was less fortunate for consumers. Now, everyone who makes a payment becomes a potential recipient of consumer credit, a form of credit that is particularly problematic regarding social inequality dynamics. The second source of inequality associated with the rise of cashless payments concerns the creation and exploitation of payment data. Digital payments not only transport money but also create a very sensitive type of data, which can be exploited by payment providers, who can sell it to other companies or even share it with autocratic governments, who can use it for surveillance.

These two mechanisms do not automatically translate into increased social inequality, as their potential effects are strongly conditioned by the state regulation of the payments industry and the type of technology used for cashless payments. In this chapter, we point out that there are at least three different institutional paths toward cashless payments in different regions of the global south. Each of these **varieties of cashless-ness** encompasses a very different set of private payment providers and different state responses. Therefore, each of these trajectories has a very

different impact on the dynamics of social inequality. The first trajectory toward cashless payments began in the early 2010s with the rise of mobile money in some sub-Saharan African countries, such as Kenya. A second trajectory toward cashless payments came with the emergence of super apps enabling QR code payments in East Asia, especially China, in the late 2010s. The third path opened up in the early 2020s when central banks in some countries—including Brazil, Mexico, Costa Rica, and India—created free instant payment systems run by the state.<sup>1</sup>

This chapter is structured as follows. Following this introduction, the next section describes the two mechanisms linked to digital payments that affect the dynamics of social inequality within societies: the entanglement of credit and payment and the exploitation of payment data. The third section provides an overview of the three pathways toward cashless payments in the global south and describes how each is linked to these new sources of social inequality. We close with reflections on these three pathways to cashless payments and attempt to develop broader policy implications.

## 2 Modern Money and the Political Economy of Payment Infrastructures

In this section, we briefly describe the history of payment infrastructures in modern nation-states to understand how the rise of digital payments affects social inequality dynamics. We suggest that two specific mechanisms linked to cashless payments impact the social structure of a society. First, the asymmetric profit making that arises from coupling the payment act to the access to consumer credit. Second, companies' ability to extract data from digital payments and exploit it for profit. We show that data mining not only acts as a catalyst for the expansion of credit but also enhances the potential for social control in autocratic countries.

Payment infrastructures are essential for the institution of modern money and, therefore, for capitalist economies as such, because they privilege legal tender and exclude all other forms of money. Therefore, payment infrastructures are the basis for integrating the general population into market transactions. Historically, establishing payment infrastructures for the public was intertwined with introducing territorial currencies (Helleiner, 2002). At the end of the nineteenth century, modern states gained the capacity to industrially produce banknotes and coins on a large scale and distribute them within their national territories (in collaboration with commercial banks). By introducing territorial currencies, nation-states thus ensured the distribution of a sufficient quantity of small coins that citizens could use to pay for their daily needs. The settlement of an increasing part of daily transactions using

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<sup>1</sup> It should be clarified that although all three avenues for providing cashless payments originated in specific regions of the global south, they are not exclusive to those regions. For example, there are attempts to establish super-applications in sub-Saharan Africa and state-driven systems in Asia.

legal tender was the precondition for the emergence of capitalist modernity (Simmel, 1900). The result of this process was the creation of a cash network, which became the basic payment infrastructure of the masses (Helleiner, 2002).

It is important not to lose sight of the fact that—although it is made available partly in collaboration with commercial banks—cash is a public infrastructure, which means that no one can be excluded from its use and that everyone can use it for free, or have access to it under the same conditions. Despite its advantages, the provision of cash has three severe limitations: (1) cash provision requires the primary institutions of the nation-state (such as central banks) to function correctly; (2) it can only be used for payments within the borders of the nation-state; (3) and there is still no functional equivalent of cash in the digital world. As of today, this implies that all digital payments, including cross-border payments, must be executed by private actors (Brandl & Dieterich, 2023). However, unlike public actors—such as central banks—private companies want to profit from providing payment infrastructures. To these ends, these firms exploit socioeconomic vulnerabilities, leading to the aggravation of social inequality. In the next section, we describe three strategies by which private payment providers make profits and how these strategies affect social inequality.

## ***2.1 Credit Card Companies: Increasing Asymmetric Profits Through the Coupling of Credit and Payment***

Until the mid-1950s, private companies had little incentive to enter the retail payments business. The main reason was that retail payments were not profitable enough, as they had high fixed costs and low marginal returns. Therefore, the main incentive for private companies until then was to achieve economies of scale. But this situation changed radically in the late 1950s, when advances in data processing and increased demand for easily accessible consumer credit led to the invention of credit cards (Mandell, 1990). Crucially, thanks to this invention, the provision of payment services—a typically unprofitable business—was linked to a hugely profitable business: the provision of consumer credit. The entanglement of payment and credit was the first step toward creating a hugely profitable payment industry, as it created strong incentives for private companies to enter the digital payments business.

Moreover, the coupling of payment and credit had another necessary consequence: it allowed the consolidation of a payment infrastructure that provides credit to all those who make a payment. Such infrastructure potentially amplifies the dynamics of social inequality associated with consumer credit. The development of a cashless payments industry allowed the providers of these payments to charge high fees for their services, thus altering the balance of power between payment providers and their customers in favor of the former. For example, in the U.S. in 2023, the national average interest rate on consumer credit card debt was 20%, and for bad credit, even 29%. In contrast, U.S. banks can obtain credit from each other at an interest rate of 5%—a differential that results in high profits.

The mechanisms behind these high-margin profits have been pointed out by the literature on the sociology of credit. This literature has shown that the relationship between creditor and debtor is highly asymmetric (Krippner, 2017; Rona-Tas & Guseva, 2018). While in other asymmetric relationships (such as that between employer and employee), the law restricts the possibilities for exploitation (e.g., a worker can only sell his labor for a restricted number of hours per week), this is not the case in credit markets (Dwyer, 2018; Graeber, 2009; Krippner, 2017). The reason for these disparities is that the labor market operates under the fiction that individuals exchange equivalents (in this case, wages and labor). Receiving credit, in contrast, tends to be framed as a gift with associated obligations (Krippner, 2017, p. 9). Unsecured debt intensifies this dynamic since collateral availability improves the credit recipient's position. Credit that arises in the payment process—credit card debt or overdrafts—is unsecured and provided solely by private companies. This contrasts with mortgages or student loans, which are provided jointly by public and private actors.

To make matters worse, not all people are equally affected by the detrimental consequences of the coupling of payment and credit. People with higher incomes tend to benefit from cashless payments, as they have access to easy, frictionless payments and short-term credit at relatively more advantageous rates. In contrast, people with lower incomes pay disproportionately high fees and interest rates, and quickly become dependent on refinancing services, thus falling into cycles of indebtedness.

Undoubtedly, the companies that have benefited the most from the link between payments and consumer credit are the credit card companies. These companies are the fastest-growing sector in the payments industry, and their profits amount to \$1000 per person per year in the United States and Europe (Leibbrandt & de Terán, 2021). Their enrichment has been so remarkable that, since 2020, Visa and MasterCard have remained more valuable than all European private banks together (Brandl et al., 2024). As of June 2024, Visa is the 15th most valuable company in the world, while MasterCard ranks 20th (Financial Times, and MarketCap website).<sup>2</sup> Undoubtedly, their enormous expansion has placed the card companies in a position of structural power *vis-à-vis* merchants, consumers, and regulators, thus opening the door to new drivers of inequality. Among these drivers, three stand out. First, their monopoly power gave card companies a remarkable ability to impose their prices and conditions. In addition, as card networks have gained more and more users, network effects have diminished the ability of consumers and merchants to refuse to use their services. Finally, their political influence also contributed to undermining regulators' power against them.

The success of the card companies was not limited to the United States. These companies expanded globally (Guseva & Rona-Tas, 2020). In Western countries, the emergence of so-called FinTechs—technology-driven companies such as Apple

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<sup>2</sup> In June 2024, VISA's market capitalization was \$551.35 billion, while MasterCard's was \$414.63 billion. Source: <https://companiesmarketcap.com/visa/marketcap>. Accessed on 07.07.2024.

Pay, PayPal, and Wise—did not challenge the power of credit card companies but made them even more powerful. A central reason for this is that most FinTechs have been reluctant to become financial institutions and cannot settle their mutual obligations with central bank money. Therefore, they have coupled with banks and card networks to settle their payments (Westermeier, 2020). In some countries, such as the United States, the reluctance of consumers to share their bank details and their confidence in the security provided by card networks has meant, in practice, that most users of virtual wallets have linked their accounts to their credit cards, resulting in an even greater flow of users for these companies.

## ***2.2 Gaining Profit and Control by Extracting Data from the Payment Process***

As we have already noted, around the mid-1950s, the first wave of digitization brought an invention that transformed the payments industry into a highly profitable business: the linkage between payment and credit. Similarly, around 1990, a second wave of digitization opened up a second source of massive revenue for private payment providers: exploiting the data generated in the payment process. The advent of the internet and the rise of FinTechs led to an explosion of payment options associated with the use of smartphones. With the popularization of these options, the payment industry began to generate an enormous amount of data associated with the payment process that provides very sensitive information about human behavior, and which became very valuable, not only for private companies but also for governments (De Goede & Westermeier, 2022; Westermeier, 2020). For private companies, payment data quickly became an additional source of profit, mainly thanks to two processes. On the one hand, companies began to use this data to adapt their products to the users' creditworthiness. Secondly, accumulating personal data enabled companies to extend their services to people previously excluded from the financial system.

The adaptation of financial products to users' creditworthiness began in the 2000s with the rise of subprime credit cards in Anglo-American countries. These credit cards target people from lower socioeconomic groups, which carry particularly unfavorable financial conditions, such as extraordinarily high interest rates and additional fees (Appleyard et al., 2016; Burton et al., 2004). As digital technologies advanced, the amount and diversity of available data increased. Unlike traditional financial intermediaries—such as banks and credit card companies, which continued to rely on their customers' financial history to decide whether to grant credit—new players in the financial sector began to use this alternative data to assess the creditworthiness of their prospective customers. The possibility of using alternative data—including purchase and payment history, employment and education data, etc.—allowed many companies to offer financial services to those previously excluded from the financial industry precisely because now there was a new way to assess their solvency and repayment capacity (Aitken, 2017).

It should be noted, however, that in most Western countries, the use of alternative data never took off, meaning that most credit decisions are still primarily based on the customers' financial history. In addition to stricter data protection regulations, the main reason behind this trend is the problems associated with data conversion between multiple applications and providers. These problems have been described by the literature on assetization (Tellmann et al., 2024). Studies done on the use of health data (Kampmann, 2024), bioeconomic data (Birch, 2017), or intellectual property rights (Braun, 2020) show that making money from alternative data remains a very controversial and precarious process. The paradoxical effect of the digitization of finance is thus a massive unbundling of financial services, which contrasts sharply with the vision of early Silicon Valley tech entrepreneurs—who dreamed of creating a single technological device that would integrate everything from shopping to banking, including social interactions and geolocation (Soni, 2022). However, as we will see in the next section, while most Western companies 'failed' to design an integrated device capable of combining and exploiting all these different types of data, private companies in East Asia did succeed in this endeavor. These companies rely on this data to extend consumer credit to people with no financial history, which has created a vast new revenue stream for them. Crucially, private companies in Southeast Asia were not the only ones to benefit from alternative data. Autocratic governments, too, took advantage of and used it for surveillance and control purposes.

### **3 Varieties of Cashless-ness: Institutional Trajectories Toward Cashless Payments and Their Consequences on Inequality**

In the previous section, we described two of the main mechanisms associated with cashless payments that affect a society's social structure. We also emphasized that the impact of these mechanisms on social inequality dynamics is determined by two other factors: the existing financial infrastructure and the type of regulation. Below, we describe three different pathways toward cashless payments that exist today in the global south and analyze the impact of each on the dynamics of social inequality.

#### ***3.1 Mobile Money in Sub-Saharan Africa: A Bottom-up Initiative***

In many sub-Saharan African countries, digital payments were not introduced top-down by private companies but bottom-up by individuals who developed informal practices to overcome the lack of a broad preexisting payment infrastructure. Especially in rural areas, citizens began to use prepaid mobile phone minutes as

money. These practices evolved in different ways, for example, in Kenya, mobile phone cards became a form of remittances used by family members working abroad to send money to their relatives in the countryside (Maurer, 2015). In Zimbabwe, where the availability of US dollar coins was limited, these cards were used as a bottom-up strategy to fight inflation.<sup>3</sup>

Over time, cell phone providers found a way to commercialize these informal practices. The most successful example is M-Pesa, a mobile banking system officially launched in 2007 in Kenya by Vodafone's subsidiary Safaricom (Mbiti et al., 2011; Natile, 2020). Although M-Pesa initially intended to specialize in micro-credit, it soon became apparent that most consumers were only interested in sending and receiving money. M-Pesa was able to build an extensive and effective cashless payment network in record time, due to its surprisingly simple and inexpensive technology. The network allows users to receive and send money by exchanging text messages between cell phones. Minutes accumulate as balances on each phone and can be transferred between customers, like a digital currency (Roitman, 2023). The system works on all cell phones, which allowed M-Pesa to take advantage of an installed network of 60 million cell phone subscriptions. In addition, a network of prepaid phone card vendors receive cash from users and deposit it as balances in their phone accounts, thus functioning as a human ATM network that integrates M-Pesa with the cash payment network. Users can use their balances to make all kinds of transactions from their M-Pesa account: sending and receiving money between network users, paying bills, utilities, and goods, and even depositing and withdrawing cash at authorized agents. The adoption of the system was phenomenal. By 2024, 17 years after its launch, M-Pesa reached 51 million active users in seven countries, including Kenya, Tanzania, and Mozambique (Dafe, 2020).

Even if social science scholars described attempts to link mobile money to consumer credit creation (Bernards, 2019; Langley & Leyshon, 2022), mobile money is still predominantly used to send and receive money. Although in some countries such as Kenya and Eswatini, the share of people using mobile money accounts to borrow money is higher (Kenya 30% and Eswatini 21%), this share is relatively small overall. For example, in sub-Saharan Africa, where mobile money is often the only financial infrastructure available, 56% of the population borrowed money in 2023. Of this group, 14% borrowed money from a financial institution, and only 7% used their mobile money account to borrow. Thus, the most significant credit demand still occurs in the formal sector. The absence of a strong link between payments and credit demand is also evident when analyzing the revenues of mobile money providers. In contrast to credit card companies (for whom interest on overdrafts represents an overwhelming revenue stream), 85% of mobile money providers' revenue comes from fees charged to their customers for payments and transfers (GSMA, 2024).

The business model of mobile money firms thus contrasts with that of other digital payment providers. Unlike credit cards or super apps (which we will discuss in

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<sup>3</sup> See <https://www.economist.com/finance-and-economics/2013/01/19/airtime-is-money>

the next section), which strongly rely on the profits obtained through consumer credit (mainly high interest rates and overdrafts) cell phone companies make money by charging fees to users for every transaction they make. This business model, in which digital payments are only marginally linked to consumer credit, has a less negative impact on the dynamics of social inequality.

### ***3.2 Financial Technology Meets Social Networks: How Super Apps Have Conquered Cashless Payments in Asia***

The ecosystem supporting digital payments in Asia is very different. As in Latin America, the payment landscape in Asia has remained cash-bound for longer than in Europe and the United States. However, unlike Latin America, most East Asian countries did not have a digital payment infrastructure until recently. The lack of a preexisting digital financial network left room for the emergence of a brand new cashless ecosystem whose institutional form differs significantly from those in the West. In Asia, the leaders of the cashless revolution have not been credit card networks and banks, but technology-driven companies that originated in the gaming industry. These companies developed so-called super apps: applications that combine many functions, such as social networking, commerce, and payments (Gruin, 2020) and allow their users to make digital payments by simply scanning a QR code. Using this technology, companies such as Alibaba (owner of AliPay) or Tencent (owner of WeChatPay) established a brand new digital infrastructure that enabled digital payments for the masses—a task that UnionPay (a quasi-governmental organization in China) could not do for a decade. Crucially, when users pay by scanning QR codes through their super apps, the information from these payments is merged with other data, including geolocation, social network data, etc.). Thus, these applications are powerful sources of sensitive data, which companies and governments can exploit (Gruin & Knaack, 2020).

China is the primary example of this model. AliPay and WeChatPay are the leading payment providers and control 90% of digital payments in China (Greiffenhagen et al., 2023). The success of these technology-driven companies in providing digital payments to the masses was not foreseeable even a decade ago. In 2013, less than 16% of Chinese owned a credit card. The primary means of payment was cash, which was also problematic because the government had trouble distributing coins and banknotes (Chorzempa, 2022, p. 55). In less than 10 years, China was at the forefront of technological innovation in finance. By 2023, nearly 88% of the population will regularly use mobile payment options. One of the main reasons behind this incredible expansion is that smartphones are cheap and, therefore, ubiquitous among the Chinese. In addition, payments via QR codes are very cheap for Chinese merchants. AliPay and WeChatPay charge merchants transaction fees between 0.38 to 0.6%, which are meager compared to the 1.5 to 3% plus 20 to 30 cents that U.S. merchants pay for accepting credit cards (Chorzempa, 2022, p. 78).

Interestingly, the rise of super apps in the last decade has not been limited to China but has also spread to many Asian countries, such as Singapore, Malaysia, and Indonesia.

The extraordinary success in financial inclusion and low digital transaction fees attached to super apps comes at a high cost: private companies' extraction and use of personal payment data. While in bank-based systems, such as those in the United States or the Eurozone, credit scoring only includes financial data (credit history), Asian super apps allow companies to combine data from various transactions, such as the customer's purchase history, data contained in their private messages, location services, and internet searches.

Super apps are very different from mobile money, which, as explained in the previous section, mainly allows people to send and receive money by sending text messages. Mobile money is a low-tech solution, running mainly from ordinary cell phones, which does not allow the collection of its users' data. In the case of super apps, the two mechanisms described in the second section—the coupling between payment and credit and the exploitation of personal data—are deeply relevant. Companies commonly use the data collected by super apps to offer consumer credit to their users, even to those groups previously excluded from the financial system. Although extending credit to the 'unbanked' is traditionally a risky business, alternative data provided a basis for better analyzing potential risks (Chorzempa, 2022). These data also serve to create financial products tailored to users of different socio-economic levels.

Although super-applications are a recent invention and their impact on the dynamics of social inequality is not entirely predictable at this point, the evidence indicates that they are increasing overall levels of indebtedness. In the last decade, the volume of consumer credit in Asia soared, and household over-indebtedness increased (Xie & Wu, 2023). In addition to generating a tight integration between payments and credit, exploiting the data produced by these apps seems to be contributing to extending the control of autocratic governments over the population.

### ***3.3 State-Driven Systems: The Nation-State as a Central Payment Provider***

In contrast to the two previous paths, where the private sector led the digitization of payments, in some countries, the state has played a crucial role in the takeoff of digital payments. Especially in some Latin American countries, such as Brazil, Mexico, and Costa Rica, central banks developed a financial infrastructure for digital payments on their own. Some Latin American central banks were concerned about the experience of Asian countries and their related risks for the public (Schapiro et al., 2023). Motivated by the objective of avoiding private monopolies, they chose to promote state-owned instant payment systems (Duarte et al., 2022). These central banks established instant payment systems that allow users to execute

and finalize payments in real time through a platform operated by the respective central banks in collaboration with national banks. PIX in Brazil, CoDi in Mexico, and SINPE in Costa Rica are examples of this state-led approach to digital payments. The most developed case is PIX in Brazil, a payment system created and regulated by the Central Bank of Brazil. Although plans to establish a public infrastructure for digital payments go back at least a decade (Schapiro et al., 2023), PIX only started operating in 2020. Already in December 2022, it had about 145 million users and 2.89 billion monthly transactions, mostly (66%) peer-to-peer payments. Unlike previously available payment systems in Brazil, transactions through PIX occur 24 h a day, 7 days a week. The average cost to merchants is around 0.2%, a low cost compared to credit card fees of 2.2% (Duarte et al., 2022). Individuals or businesses can pay using their regular accounts at one of the nearly 800 payment service providers participating in PIX (banks and non-banks). Technology companies account for about 10% of the companies providing financial services through PIX. Duarte et al. (2022) conclude that two factors appeared to be crucial to the success of PIX: the mandatory participation of large banks and other financial institutions (with more than 500,000 transaction accounts), which functioned as a trigger for the network effects of the system. Second is the central bank's dual role as a digital infrastructure provider and rule setter.

A second example of an instant electronic payment platform created and operated by a central bank is CoDi in Mexico. CoDi uses QR codes and near field communication (NFC) technology to enable communication between devices near each other. CoDi launched in 2019 and had 12 million accounts by 2022. Only authorized financial institutions can access the system. To use CoDi, users must have an account at a participating institution and a mobile device with the CoDi app capable of reading QR codes. Payments are processed instantly, at any time, and without fees.

Although these systems are incredibly recent, their low associated costs and rapid expansion indicate that they represent a highly inclusive instant payment option with enormous potential to mitigate the dynamics of inequality associated with the cashless revolution in other regions.

## 4 Conclusion

This article has elaborated on the social consequences of replacing cash with digital alternatives. Our general claim is that cash substitution can aggravate social inequality. We identify two main mechanisms associated with digital payments that affect social inequality dynamics: the coupling of credit and payment and the exploitation of payment data. The coupling of credit and payment was crucial in opening up a huge revenue stream for private cashless payment providers (especially credit card companies). Such linkage also put consumers in a weaker position and further intensified the adverse effects associated with the expansion of consumer credit. Second, the digitalization of payments made it possible to extract sensitive consumer data. Using this data intensifies the first mechanism, making it possible for

companies to offer credit to consumers previously excluded from financial services. In addition, the exploitation of this data opened the door to a broader surveillance of consumers and citizens.

In the previous paragraphs, we showed that the influence of both mechanisms on social inequality dynamics is strongly determined by the regulation of the payments industry and the infrastructure in place. To illustrate this process, we described three pathways toward cashless payments and their potential effects on inequality dynamics. The first pathway to digital payments is mobile money, which originated in sub-Saharan Africa. Mobile money is predominantly an infrastructure for sending and receiving money, which only reluctantly links digital payments to the creation of consumer credit. Although users have to pay high fees for each transaction, in general, mobile money does not carry the same potential for household over-indebtedness as digitalization based on credit cards or super-applications. The second route to digital payments is super apps, which integrate QR code payments into an entire digital ecosystem. Although this route to digital payments is a big step for financial inclusion, super apps do not seem to be a desirable option, as they have a high potential to drive household over-indebtedness and give autocratic nation-states' new tools to control their population. The third path is the implementation of state-run payment systems administered by central banks. Like mobile money, these state-driven systems are primarily aimed at facilitating payments between individuals. However, while mobile money account users pay fees for each transaction, using systems such as PIX is free of charge. The question of how these state-driven systems interact with the dynamics of inequality is tricky to answer, as these systems were put in place very recently, and there is still limited research. However, these central bank-run systems seem to have achieved something extraordinary: creating a digital system close to a functional equivalent of cash, a public infrastructure that can be used for free, with great potential for financial inclusion, but that does not exacerbate indebtedness.

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