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Small money, large profits: how the cashless revolution aggravates social inequality

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Abstract

The replacement of cash by cashless alternatives carries huge potential to aggravate social inequality. Governments struggle to manage these dynamics since they must keep a delicate balance between the formation of strong players and the provision of inclusive payment options. Studying the political economy behind the payment industry is crucial to understanding how digitalization has transformed payments. To this aim, we look at the history of the payment industry in two cases: the USA and the euro area. In the USA, the cashless revolution gave rise to an oligopoly of two extremely successful credit card companies, which, however, resulted in a banking system that does not serve the needs of at least one-fifth of the population. In the euro area, the population has access to affordable financial services; however, neither the private nor the public sector has been able to provide the infrastructure to integrate European payments.

Key words: financial services; inequality; Europe; USA; technology

JEL classification: G210 Banks; Depository Institutions; Micro Finance Institutions; Mortgages; O31 Innovation and Invention: Processes and Incentives; P5 Comparative Economic Systems

1. Introduction

Until 2020, the most valuable financial sector company was always a bank (CompaniesMarketCap 2023). In that year, the credit card company Visa had finally overtaken the mighty JPMorgan Chase and become more valuable than the top-ten European banks combined (Leibbrandt and De Terán 2021: 50). What happened? How did payments, traditionally the least profitable business area in the financial sector compared to investments and asset management, become so lucrative? In this article, we show that this development's origin is rooted in the gradual replacement of cash and digitalization.

Further, we claim that the rise of cashless payments is not just a simple switch to a new (digital) payment medium but a profound transformation of how we use and access money. This is so because cash—as the original public infrastructure that facilitates everyday payments—is by its nature inclusive (since everyone can use it under the same conditions), while cashless alternatives are not. The infrastructure that enables cashless payments is typically provided by profit-seeking private players, who pass on the costs to merchants and consumers under varying conditions. Digitalization refers to the process of expanding payment methods that do not require physical tokens such as cash or paper checks. The financial industry has experienced two distinct waves of digitalization. The first wave began in the late 1950s with advancements in data processing and led to the emergence of credit cards. The second wave commenced in the 2010s with the rise of fintech, which primarily developed the technology for financial services on smartphones. The development of the cashless payment industry can also be described as the gradual replacement of public by private infrastructure. Crucially, this substitution has significant consequences for social inequality: while people with higher incomes typically benefit from cashless payments through easy and frictionless payments and access to short-term credit, people with lower incomes become increasingly dependent on financial services for which they pay disproportionately high fees.

The main contribution of this article is to explain why the replacement of cash carries such huge potential to aggravate social inequality and why governments struggle to manage these dynamics. We suggest that payments[1] have a different logic than other key business areas of the financial sector such as asset management or investment. While the latter tend to have high volume but fewer transactions, the opposite is true for payments, where we see low volume but many transactions. This results in a situation in which the infrastructural costs for establishing and maintaining a working payment infrastructure are very high, creating entry barriers and leading to strong concentration tendencies (Evans and Schmalensee 2004; Stearns 2011). However, the recent success of a few private companies that make extraordinary profits is the result not only of the specific structure of the payment industry. That success is also based on the changes introduced to the payment process itself: When payments are made in cash, payment and credit functions are strictly separated; with the invention of credit cards (and to a lesser degree debit cards) for making cashless payments, the two processes were coupled.

The extension of financial services to new population sectors—especially lower socioeconomic classes (Burton et al., 2004; Appleyard, Rowlingson, and Gardner 2016) as well as emerging economies (Gabor and Brooks 2017)—opened a massive stream of revenues within the payment industry. In addition, the fusion of credit and payment ultimately transformed payments into a profitable business area for private companies. This fusion, however, had major consequences for inequality. Cashless payments amplify the social inequality dynamics attached to consumer credit because they link them to an infrastructure that everyone has to use to survive in a modern society: the payment system. The coupling

1 We are specifically concerned with retail payments, which means the relatively small payments made daily by consumers and merchants. There exists another type of payment, wholesale payments, which are large payments between financial institutions. The transactions between financial institutions, however, exhibit a very different logic since here the volumes are high but very few transactions are made.

of payment and credit also systematically puts the consumer in a weaker position, since the transaction between creditors and debtors is not an exchange between equals as in the wage relation, but rather a gift relationship (Rona-Tas and Guseva 2014; Krippner 2017). So far, the sociology of credit has shown how certain types of credit create inequality (Graeber 2011; Krippner 2017; Dwyer 2018); however, most studies have overlooked how the so-called cashless revolution and the rise of the payment industry have fueled credit expansion, thus enhancing conditions that can exacerbate inequality even further.

The topic of payments has been largely neglected in international political economy as well as in economic sociology. In recent years, however, a growing number of publications started to recognize financial infrastructures as places where power is (re)negotiated within financial markets (Rona-Tas and Guseva 2014; Bernards and Campbell-Verduyn 2019; Krarup 2019; Pinzur 2021; De Goede and Westermeier 2022). Within this debate, an important stream of research looks at the role of financial infrastructures along the north-south international divide. These studies examine whether digitalization can promote the financial inclusion of (unbanked) people in the Global South. The results of these studies are mixed: while some scholars conclude that digital financial technologies afford some agency and economic opportunity for disadvantaged communities (Maurer 2016; Rodima-Taylor and Grimes 2019), other studies (Gabor and Brooks 2017) find that fintechs accelerate financialization as companies gain access to the consumer data of previously excluded communities. Another line of inquiry of social scientists who study financial infrastructures in the Global South is the relationship between monetary sovereignty and payment infrastructures (Fritz et al., 2023; Roitman 2023). Studies on financial infrastructure in the Global South show the connection between social inequality, payment infrastructures, and the role of state actors. However, such questions are rarely asked regarding the Global North. Moreover, even if certain aspects of financial inclusion, community banking, and the role of tech-driven companies are well-studied in the USA (e.g. Baradaran 2015; Servon 2017; Westermeier 2020), a conceptual approach is missing.

Seeking to add a new layer to these debates, we compare in this article recent developments within the payments industry and their consequences for private consumers in two cases from the Global North: the USA and the euro area. Cashless payments started first in the USA with the invention of credit cards in the 1950s and debit cards in the 1970s. The rise of fintech and the Covid crisis of the early 2020s accelerated this shift. Indeed, even if the share of cash payments in the USA was already low in 2017 (36 per cent), that share had dwindled even further by 2022 (21 per cent) (Federal Reserve Bank of Atlanta 2023). In the euro area, the replacement of cash has been less pronounced. In fact, in 2016, the average share of cash payments in the euro area was 79 per cent (ranging from 54 per cent in Finland to 87 per cent in Spain and 92 per cent in Malta) (Esselink and Hernández 2017). By 2022, the average share had fallen to 59 per cent (ranging from 19 per cent in Finland to 70 per cent in Austria and 77 per cent in Malta), a decline of twenty percentage points in only 6 years (Esselink and Hernández 2017; ECB 2022) (see Fig. 1).

Building on these two cases, we claim that we can only understand how digitalization is transforming payments and exacerbating social inequality if we pay attention to the political economy behind the payment industry.

Looking at the history of the payment industry in the USA and the euro area (and Europe more broadly), we conclude that governments in both regions struggled to maintain a delicate balance between the formation of strong players that provide effectively working

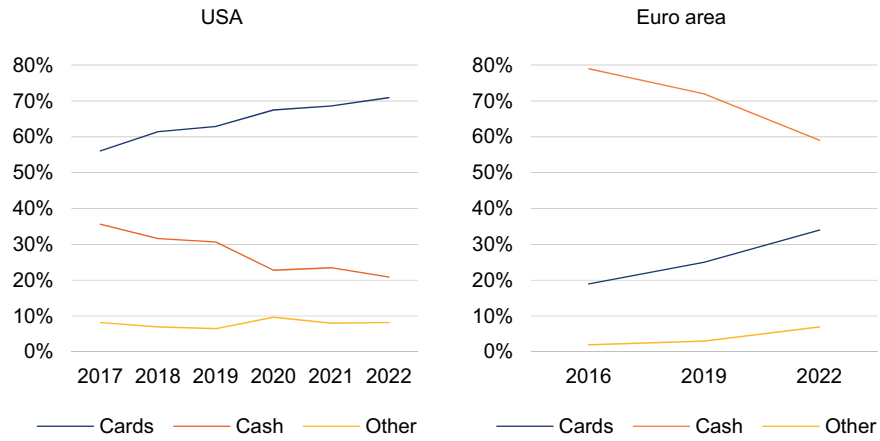

Figure 1. Market share of payment method at the point of sale.

Notes: For the USA: Other includes checks, money orders, electronic payment, payment with PayPal, account to account transfer, mobile payment, income deduction, multiple payment methods for one payment, unreported payment methods, and other responses that could not be recategorized into one of the existing payment instrument categories. FED data display POS and P2P-payments together. However, comparability with euro area data remains eligible as the share of P2P payments is insignificant. Bill payments are not included. Percentages may not add up due to rounding. Data from 2019 incomparable because of a change in methodology. For the euro area: Other includes mobile app payments, bank cheques, credit transfers, loyalty points, vouchers and gift cards, and other payment instruments. ECB data displays POS and P2P-payments separately, so the latter is not included in the graph above. However, comparability with US data remains eligible as the share of P2P payments is insignificant. Bill payments are not included. Percentages may not add up due to rounding.

Data sources: For the USA: Federal Reserve Bank of Atlanta (2023); for the euro area: ECB (2022).

payment infrastructures, on one hand, and the provision of inclusive payment options for the broader population, on the other. This comparison brings to the fore two central dimensions that are crucial to understanding why digitalization is transforming payments and fueling social inequality: the political regulation of the payment industry and the role of public infrastructures in the payment process. Our research is based mainly on the analysis of three types of sources: (1) reports and other publications produced by the payment industry and public actors such as central banks and consumer protection offices and attendance at public events of central banks and other players; (2) data provided by national and international organizations such as the World Bank; and (3) sixteen semi-structured, in-depth interviews with regulators and market participants such as employees of central banks, commercial banks, and startups (see Supplementary Appendix).

This article is structured as follows. The next section outlines our theoretical framework—the political economy of payments. The third section provides an overview of the history of cashless payments in the USA and the euro area. In the fourth and fifth sections, we discuss two key aspects that shape the dynamics of payment infrastructures and social inequality: the regulation of the payment industry and the division of labor between private

and public institutions. We close with reflections on the broader policy implications of the shift toward a cashless society.

2. The political economy of payments

Payment infrastructures are essential for the institution of modern money and, therefore, for capitalist economies as such because they privilege the legal tender and exclude all other forms of money. Payment infrastructures are, thus, the basis for the integration of the broader population in market transactions (Helleiner 2003). However, the provision of payment services follows a radically different logic than other business areas of the financial sector, such as financing and asset management. In this section, we develop a conceptual framework that dives into these differences. We introduce our argument in three steps: first, we look closely at the historical development of payments in order to understand why the structure of the payment industry makes it so difficult for companies to earn profits from everyday payments. Second, we describe what fundamental shifts transformed payments into a profitable business for private companies. And third, we explain why there are structural tendencies in the payment industry toward market concentration and the rise of single dominant players.

2.1 The difference between "small money" for daily payments and "big money" for investments

Before the introduction of territorial currencies in the nineteenth century, there was a divide between two types of money, the "small money" used for daily payments and the "big" money of the private banks, which was primarily used by merchants and wealthy families for trade and other large enterprises (Helleiner 2003: 27). In other words, what we know as money is, in fact, a blend of two types of money previously used by different socioeconomic classes. In this article, we claim that although this fusion was successful on the surface, both types of money still show different economics in their production.

The "big money" comprised high-denomination coins that, from very early on, were augmented using transfer methods that required only paper, such as bank clearance of debt, bills of exchange, or government bonds (Ingham 2004: 121). On the other hand, there was the "currency of the masses," low-denomination coins that served the needs of the local economies (Helleiner 2003: 27). Producing low-denomination coins was never as profitable as producing high-domination coins. Since manufacturing both types of coins required the same technology (minting), both forms of money required the same amount of labor but delivered very different profit margins (Cipolla 1956; Sargent and Velde 2001; Volckart 2018).

The problems associated with the costs of producing small money endured throughout the Middle Ages but were eventually resolved in the nineteenth century when nation-states introduced territorial currencies, an innovation that solved two problems simultaneously. First, the application of industrial technologies to produce low-denomination coins reduced the problem of the higher production costs for coins of lesser value. And second, the emergence of nation-states meant that there was finally an actor that could compensate for the remaining disparities in profit margins and production costs of manufacturing "small money" and maintaining payment infrastructures (Helleiner 2003). Indeed, cash—an entirely public infrastructure—was for many decades the infrastructure that allowed the great

majority of citizens (at least in the Global North) to receive their wages, pay their rent, and purchase goods in markets, without incurring any costs.

2.2 The transformation of payments into a profitable business

Because the provision of infrastructure for day-to-day payments was not profitable for private players, not enough "small money" was produced and shortages inevitably ensued. This problem was only solved when nation-states stepped in and provided token money, which was produced by the central banks. This institutional constellation, however, came increasingly under pressure with digitalization. Nowadays not only "big money" but also "small money" transactions occur without the movement of physical tokens, that is, on a cashless basis. The infrastructure that allows cashless payments, however, is provided mainly by private companies and not by the state. What happened to make private companies suddenly find economic incentives to provide payments services to "small money" consumers?

We claim that the shift toward cashless payments is not a superficial change from physical to digital or other alternative forms but a profound change of the character and the political economy behind payments. The main reason why the provision of payments became profitable is the entanglement of two processes that were previously separate: payments and credit. The financial instruments that were used for investments ("big money") always included an element of credit. For example, bills of exchange are credit from the perspective of the drawer, but they can also be used as a means of payment. In "small money," however, the divide between credit and payment was clear-cut. This distinction ended with the increase of cashless payments, especially with the advent of credit cards, the essential medium of cashless payments (Mandell 1990). Today the fact that credits arise in the payment process, for example, that purchases paid by credit card are accumulated and settled later, is so self-evident that we take it for granted.

The seamless coupling of payment and credit had an important consequence: the consolidation of a payment infrastructure that brings credit to everyone who engages in a payment, thus potentially amplifying the social inequality dynamics attached to consumer credit. One major consequence of this development was the altered social relation between payment providers and customers in favor of the former, who can extract high fees for their services. For example, in the USA in 2023 the national average interest rate on consumer credit card debt is 20 per cent and for bad credit even 29 per cent, while banks can get credit from each other at an interest rate of 5 per cent (see Fig. 4).

The mechanisms behind such high-margin profits have been extensively pointed out in literature on the sociology of credit. Scholars have argued that the creditor–debtor relationship is by nature highly asymmetrical (Rona-Tas and Guseva 2014: 75). While in other asymmetrical relationships (such as that between employer and employee) the law restricts the possibilities of exploitation (e.g. a worker can only sell her labor for a restricted number of hours per week), this is not the case for credit markets (Graeber 2011; Krippner 2017; Dwyer 2018). 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 a credit, on the other hand, tends to be framed as a gift with attending obligations (Krippner 2017: 9). While the formal equality of the wage relation provides a basis for political demands, this is not the case for the creditor–debtor relationship, where the credit taker is considered to be in a morally weaker position. Unsecured debt intensifies this dynamic,

since the availability of collateral improves the credit taker's position (Krippner 2017). Credits that come about in the payment process (credit card debt or overdrafts) are unsecured and provided solely by private companies. This contrasts with mortgages or student loans, which are in many cases jointly provided by public and private actors (Dwyer 2018: 251, Preunkert, 2021).

In short, we claim that the shift from cash to cashless payments finally transformed payments into a profitable business by linking everyday payments to (consumer) credit. Such a transformation, in turn, not only generated huge economic benefits for those issuing the credit, but contributed to expanding credit relations even further. Not surprisingly, the transformation of payments into a profitable business drew the attention of private players seeking profit, who suddenly found incentives to provide the infrastructure to enable small-value cashless payments.

2.3 The replacement of cash and the growing power of the private sector

The coupling of payment and credit paved the way for the consolidation of big private players in the payment industry. However, another factor also contributed to the success of a few dominant players: the specific characteristics involved in providing an infrastructure for cashless payments.

Cashless payments require a comprehensive infrastructure that connects all banks, vendors, and consumers. While cash payments already include clearing[2] and settlement,[3] processing cashless payments is much more complex (Rona-Tas and Guseva 2014). In principle, a digital payment infrastructure must accomplish two feats: first, establish and maintain an infrastructure that reliably connects all agents and, second, create a stable linkage between the central bank and private banks since every payment must be consistently coupled with the transfer of central bank money (Brandl and Dieterich 2023). The challenges of establishing and maintaining a payment infrastructure are equivalent to providing other infrastructures such as electricity or water services; it is a situation characterized by high fixed costs in relation to very low variable costs as well as large barriers to market entry. In economics, these problems are described by the concept of a natural monopoly (Baumol, Panzar, and Willig 1982). Industries with these characteristics naturally show strong concentration tendencies, which lead to the rise of an oligopoly or even a monopoly in the long run. In the payment industry, these tendencies were at least temporarily held in check by a particular constellation involving the stable collaboration of the major banks and the nation-state's support of these alliances (Allen, Christodoulou, and Millard 2006), but concentration tendencies have strengthened since the 2010s.

For many years an institutional arrangement of public and private actors worked as an institutionalized protection against the rise of single powerful actors, at least in the domestic payments industry. Traditionally, the first step (clearing) in executing a payment was not undertaken by a single actor, since almost all clearing houses are organizations created by their members' banks. However, the collaboration between agents processing payments was and, in many ways, still is supported by the state. In fact, the second step (settlement)—

2 Clearing refers to a process by which all reciprocal claims are set off against each other (netting). Only the differences are credited or debited at the end of a fixed period.

3 Settlement refers to the actual movement of money, which in most cases implies the transfer of central bank money.

the actual movement of money—is always executed through a public infrastructure that is provided by the central bank (Brandl and Dieterich 2023). This public–private arrangement became increasingly irrelevant with the rise of credit card companies. Although the companies started as associations of banks, they eventually became independent players and were able to turn the global payment infrastructure into a private oligopoly. While in traditional payment systems, the establishment and maintenance costs and the benefits were shared by the participating banks, this is no longer the case. Now a duopoly of two private credit card companies (Mastercard and Visa) dominates the payments market and asserts a high degree of power over setting fees and rules.

To summarize, in this section, we have shown how payments, originally an infrastructure that was highly unattractive for private players, were transformed into a lucrative business area. The main component of this transformation was the structural linkage of credit and payment primarily via consumer credit cards. This entanglement allowed private companies to extract rent out of payments and put the consumer in a structurally weaker position. The power of the private companies was enhanced by the specific structure of the payment industry, which inevitably led to concentration. In the following section, we explore how the specific structure of the payment industry also created a dilemma for governments that have to regulate payments. On the one hand, governments need to ensure the provision of a functioning digital payment system that includes the majority of the population. On the other hand, they need to counteract the side effects created by the existing private payment infrastructure, which systematically aggravates the inequality dynamics attached to the expansion of consumer credit.

3. The history of cashless payments in the USA versus the euro area

Here, we compare how different governments, namely those in the USA and the euro area, have dealt with the consequences and dynamics that arise from the digitalization of payments. Our goal is to understand what factors determine how inclusively each of these payment systems is structured. Two dimensions are crucial for this analysis: first, the regulation that determines the power of the payment industry versus the consumers; and, second, the role of the public infrastructure in the payment process. We have already shown that cashless payments are facilitated by a complex web of private and public players. The critical question, however, is how well the public infrastructure is connected to the system's private parts.

3.1 The USA—the entanglement of payment and credit and the rise of credit cards

The rise of cashless payments in the USA started with two processes: the demand for easy access to consumer credit in the middle-income sectors and technological progress in data processing (Gießmann 2018). The 1950s and 1960s were a period of significant transformation of the consumer culture in the USA. After World War II, the development of the Fordist production model boosted the rising consumption levels of middle-class families, who now had enough money to buy goods that increased their comfort levels, such as automobiles, televisions, washing machines, and other household appliances. While in other economies, access to consumer credit was impeded by the regulation of banks, in the USA, consumer credit was promoted as a welfare instrument (Trumbull 2012). One of the most

iconic forms of cashless payment emerged in this context: credit cards. By then, the middle classes were clamoring for greater access to easy credit and bank loans. Crucially, credit cards satisfied this demand, proposing a model that intertwined ease of payment with direct access to a line of retail credit issued by a bank.

By 1970, technological progress gave way to a second key innovation: debit cards. The technological advances that helped credit cards improve (especially the invention of the magnetic stripe and the electronic POS terminal) served not only to standardize the credit card market but also to ensure interoperability of payments. They were also a prerequisite for the invention of debit cards, which, among other things, require online authorization (Leibbrandt and De Terán 2021). From the beginning, debit cards, which draw money directly from the cardholder's bank account, were intended to replace cash, not credit cards (Hoenig 1995). Although the first debit cards were released in 1970, their use was relatively limited before 1989. In fact, throughout the 1980s, most Americans continued to make many of their payments by credit card and check. But in the 1990s, the advent and popularization of the Internet brought about a complete metamorphosis of the payment system. A vital part of this transformation was the emergence of e-commerce, which combined the accumulated experience of credit and debit card companies with telephone purchases (Leibbrandt and De Terán 2021).

Over decades several companies, as well as different models of cashless payment cards, fought in the US market for dominance. Eventually, an oligopoly of two companies emerged: Mastercard and Visa. The decisive battle in the payment sector was fought between so-called go-it-alone systems, for example, American Express, and the associations of banks such as Visa and Mastercard. When these associations of banks were finally able to overcome their standardization issues and to establish interchange and authorization systems, they benefited from a business model, which Evans and Schmalensee (2004) named co-opetition, by which the members co-operate in a few key areas and compete in almost every other dimension. The advantage of bank-based systems was strengthened through the rise of debit cards since it allowed Visa and Mastercard to quickly establish themselves as key competitors in the remote payment business. Thus, between the mid-1990s and the early 2000s, a new inflection in the payment choices of Americans took place. Both companies eventually succeeded because they were large enough to build platforms that provided enough value through network effects and, therefore, attracted cardholders and merchants at the same time (Evans and Schmalensee 2004: 152). Their success was not limited to the USA; they expanded globally (Rona-Tas and Guseva 2014). The percentage of people worldwide who own a credit or debit card rose between 2011 and 2021 from 35 per cent to 55 per cent, an increase of over 60 per cent in a single decade (The World Bank 2022). Mastercard and Visa are by far the most important providers of these cards, challenged only by UnionPay in China and JCB in Japan.

The predominance of credit card companies has been challenged by the emergence of the so-called fintechs or tech-driven companies such as Apple Pay, PayPal, Venmo, Wise, and Zelle that use digital technology to provide financial solutions to individuals and businesses. Even so, the rise of fintechs and the entrance of tech-driven companies in the payment sector has not resulted in the decline of the power of credit card companies. One primary reason for this is that, by law, only banks have access to the Federal Reserve's books, which means that they can settle their mutual obligations with central bank money. Most fintechs and tech-driven companies, however, have been reluctant to become banks

themselves (Westermeier 2020). In stark contrast to the narrative that startups with digital business models are taking over the industry, traditional players have actually increased their dominance even further. Credit card companies, for example, were able to establish an infrastructure that benefits the major players. Here in the words of an employee of a fintech:

> There are no strong motivations to go against card companies in the U.S. On the contrary, many actors derive benefits from card networks. Credit cards are an essential source of revenue for banks because they charge interest on credit and overdraft fees. (…) As most U.S. consumers are reluctant to share their banking data, fintech applications in the U.S. mainly move money through the VISA or MasterCard networks. Consumers, for their part, enjoy the many benefits the system offers them: the cards are easy to use and offer consumer protection and multiple benefits and rewards programs, from discounts and accumulable points to traveler benefits. Governments also prefer card payments because they can monitor them and control money laundering and other crimes. (Interview #3)

3.2 The euro area—a story of integration failure

The recent history of the European payments system is characterized by recurrent attempts to integrate and harmonize the different national payment infrastructures in the context of accelerated European integration. Although cash payments in the euro area became unified and harmonized with the introduction of the euro, non-cash payments were, and still are, mainly channeled through nationally organized systems (Noteboom 2015: 339). While in the USA, the only alternative to credit or debit cards is handwritten checks, in larger European countries (such as France or Germany), the national payment systems enable relatively affordable and convenient cashless payments via bank accounts. These systems trace back to the introduction of giro clearing between 1890 and 1920 by most Western European economies, with the notable exceptions of the UK and its former colonies, the USA, and the Commonwealth (Thomson 1964). In the beginning, national governments established giro networks in cooperation with central banks and cities, using the existing infrastructure (post offices). These networks sought to improve the older check technology and were predominantly used for business purposes and government transfers. However, since the 1960s, private banks joined the giro system to facilitate cash transfers between customer accounts (Leibbrandt 2004: 99). Today, these private–public networks are still the basis for fast and cheap transfers between private customers in most European countries. Although these nationally organized systems work well for domestic payments, they cannot facilitate transfers to other European countries.

European governments made several attempts to overcome the national fragmentation of payments and promote economic integration through a pan-European retail payment scheme (Huch 2013: 158). The rapid growth in intra-European travel in the late 1960s (Judt and Krueger 2014: 347) increased the demand for such a scheme. Eurocheques, launched in 1969, were the first widely known pan-European cashless payment system. At its peak in 1988, 50 million Eurocheques circulated over Europe (Judt and Krueger 2021: 320). However, the spread of ATMs and card payments starting in the late 1970s and accelerating in the late 1990s and early 2000s diminished the importance of Eurocheques (ECB 2014: 29; Judt and Krueger 2021: 320), which stopped circulating at the end of 2001.

The most promising effort to establish a pan-European payment scheme after Eurocheques was the Single Euro Payments Area (SEPA) Project. Launched in 2008, SEPA was initiated by the European Payment Council, a board representing European banks. SEPA's main goal was to harmonize European payment rules and standards (ECB 2019).

The SEPA project sought to strengthen three non-cash payment instruments: credit transfers, direct debits, and card payments (ECB 2014). While the SEPA project was quite successful in fostering SEPA Credit Transfer and Direct Debit schemes, it failed to harmonize card payments, the dominant form of non-cash payments, which have remained highly fragmented across European countries (ECB 2019).[4] One potential reason that explains this enduring fragmentation is that in the beginning, European banks did not see the development of a SEPA for cards as part of their remit, as national schemes were widely established and working well (Bruggink 2022: 266).

What stands at the center of this fragmentation, however, are the fundamentally different cost-benefit analyses of the involved banks. While European fee regulation has substantially reduced the potential for payment revenues for European banks, US-based card networks still count on an immense stream of revenues. In 2021 per capita revenues in the US payment industry were around US$1,300. In contrast, they were only around $270 in the Netherlands. Although revenues in other European countries were slightly higher—Germany: $300, France: $400, and Italy: $550—what payment providers make in Europe is only a quarter to a half of what they make in the USA (McKinsey 2022: 8). The reasons for this discrepancy in revenues will be laid out in the following sections. At this point, we want to emphasize that US-based card networks have the resources to meet the high fixed costs for maintaining a pan-European card network because their market is larger and their revenues are much higher. The cost–benefit analyses for European banks are different: for them the ambitions and costs of developing a pan-European scheme stand in stark contrast to the well-functioning and beneficial historically grown collaboration of banks with US-based card companies. The missing incentives of banks to develop a European payment solution, however, stand in stark contrast to the political goal of European integration and the establishment of a payment infrastructure provided by European players that can therefore be controlled by European institutions.

4. The paradoxical effects of financial inclusion and the regulation of the payment industry

Having traced the history of cashless payments in the USA and the euro area, we now seek to shed light on specific aspects of the architecture of payment infrastructures that are particularly important for understanding how the shift to cashless payments influences the dynamics of social inequality. This section examines the degree to which credit and payment are interlinked, and the next examines the role of public versus private infrastructure.

Recent decades could be characterized by some as an enormous success with regard to financial inclusion. In the euro area, the share of households with access to a bank account rose from 90 per cent in 2011 to 99 per cent in 2021. The same is true for the USA where the share rose from 88 per cent in 2011 to 95 per cent in 2021 (The World Bank 2022).

4 Failed projects initiated by banks include Euro Alliance of Payment Schemes (ECB 2014: 32; Bruggink 2022: 272) and the Monnet project (ECB 2014: 33; Bruggink 2022: 269).

The substantial increase in the share of households with access to a bank account should not obscure the fact that the US banking system excludes a high number of people systematically. In 2021, 5 per cent of households in the USA were unbanked, which means that no one in the family has a bank account. Another 14 per cent are regarded as underbanked, which means that they have at least once in the last year used an alternative outside of the banking system[5] to meet their transaction or credit needs (FDIC 2021). This implies that the US banking system does not meet or only partly meets the needs of almost 20 per cent of the population. Furthermore, the share of people who are fully or partly excluded from the financial system differs according to race, education, and income. While only 2 per cent of the White population does not have access to a bank account, over 11 per cent of Black people and 9.3 per cent of Hispanics are unbanked. The situation is worse if we take income into account. Among households earning less than US$15,000 per year, 29 per cent of Black households have no bank account, compared with 14 per cent of low-income White households and 27 per cent of Hispanic ones at the same income level (ibid).

In the euro area, the situation is quite different. As noted above, in 2021, 99 per cent of the population had a bank account (The World Bank 2022). Access to financial services is dependent on one's position within the society to only a limited degree. The critical factor of financial inclusion in the euro area remains nationality; while in the countries in the center of the euro area such as France, the Netherlands, and Germany over 99 per cent of the population have a bank account, some countries in southern Europe such as Croatia (92 per cent), Portugal (93 per cent), and Greece (95 per cent) have lower rates.

In Fig. 2, we see the differences in ownership of a bank account according to a person's level of education, which we use as a proxy for income.[6] In the USA, under 60 per cent of the population with only primary education or less had a bank account in 2021; in the euro area coverage of this population group had reached 97 per cent. While many alternatives outside the banking system exist in the USA, these services—apart from remittance services—are hardly used in Europe. This would help explain why, to our knowledge, there is no data about underbanked people within the euro area.

While access to financial services is important, another dimension is central to the connection between payment systems and social inequality—the regulation of any debt that might arise in the payment process. As explained earlier, the rise of cashless payments has coupled payment with credit, a key factor that made the payment sector a fertile environment for profits. However, the extent to which credit and payment are coupled differs significantly between nations (Rona-Tas and Guseva 2018).

While in the euro area, cashless payments are largely made via debit cards, which means that little or no credit creation is involved, in the USA, consumer credit was extensively promoted by credit card companies. Circumscribed initially to a male, white, and traveling clientele, by 1990, the credit card market had expanded to all social strata thanks to the banks' active policy of targeting young families and lower-income groups with acute credit needs (Dwyer 2018). Before 1970 credit card debt was virtually non-existent in the USA, but by 2022 the average credit card debt per capita totaled $5,474, which is the highest rate

5 Such as money orders, check cashing, or international remittances (i.e. non-bank transactions) or rent-to-own services or payday, pawn shop, tax refund anticipation, or auto title loans (i.e. non-bank credit).

6 The World Bank Global Findex Database does not provide data on income.

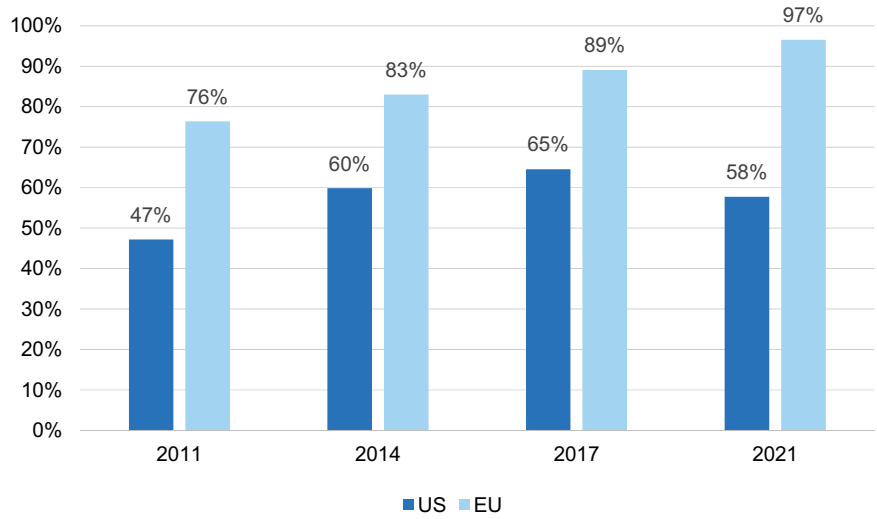

Figure 2. Bank account holders with primary education or less, USA versus euro area.
Data source: The World Bank (2022); own calculations.

worldwide (Petrovska 2023). Unsurprisingly, this expansion came with a price: the creation of a two-tiered credit card system with prime and sub-prime credit (Burton et al., 2004; Appleyard, Rowlingson, and Gardner 2016). While the prime customers profit from high rewards and relatively low interest rates, the sub-prime and deep prime customers are subject to unduly high fees (Servon 2017).

Especially the fees for credit card debt disproportionately affect lower-income social groups. Although the credit card debt in the USA is relatively high in all social strata, credit card debt in relation to income is disproportionately higher in low-income groups. In Fig. 3, we see the ratio of the median annual income to the average credit card debt in different income percentiles in the USA. While credit card debt amounts to 30 per cent of the income of those earning the least, it is only 4 per cent among those making the most. This is even more alarming when we look at the interest rates for credit card debt over time. In Fig. 4, we see the interest rates for credit card debt in the USA and the euro area as well as the EURIBOR and the USD LIBOR, the interest rate at which banks lend to each other. Here we see not only that the interest rates in the USA are, on average, three times higher than they are in the euro area, despite the equally low rates they pay for credit from the central banks, but also that the interest rates for "bad credit" (a category that does not exist in the euro area) are even ten basis points higher than the national average.

In the euro area, the credit card debt problem is generally less severe. Although the situation is slightly different in every country, the majority of payment cards in use are debit cards, and even if cards are named "credit cards," they are rarely "true" credit cards in the US sense. In Germany, for example, what people call credit cards are usually charge cards, which are tied to a checking account from which outstanding debt is withdrawn, mostly within a month. This means that credit cannot be rolled over to the next month, which implies there is no such thing as "building credit" in Germany (Mertens 2017). In the euro

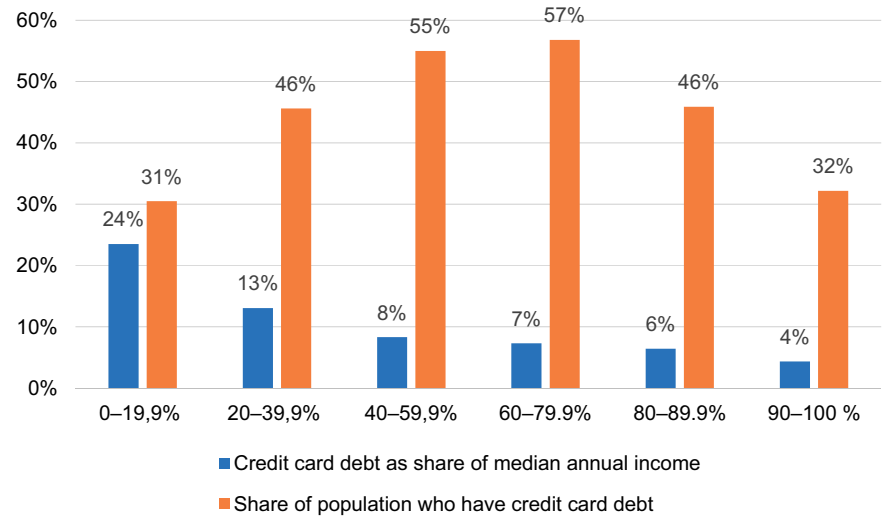

Figure 3. Credit card debt, USA, in income level percentiles, 2019.
Data source: Board of Governors of the Federal Reserve System (2022); own calculations.

area, approving sub-prime credit cards is also unusual; if individuals have a bad credit score, they are typically forced to use prepaid cards that do not bear the risk of accumulating credit card debt.

Another type of fee contributes to the fact that the revenues of credit card companies in Europe are only a quarter to half of what they make in the USA (McKinsey 2022: 8): interchange fees. Interchange fees are collected by card companies from merchants and are often passed on to consumers through price increases. These fees are a crucial source of revenue for credit card companies and cooperating banks alike. But in Europe, interchange fees also came to be seen as an obstacle to the development of a single European payments market, as they were highly diverse and often non-transparent (Bruggink 2022: 272). In addition, the international card companies could use their growing power to engage in discretionary fee setting. In response, the European Commission introduced the European Regulation on Interchange Fees in 2015, capping fees at 0.2 per cent of the transaction value for debit cards and 0.3 per cent for credit cards (Eley 2015). Although recent data suggest that, at least for the German payment market, Visa and Mastercard have responded to these fee caps by changing their fee structure, with so-called scheme fees[7] appearing to have risen steadily in recent years, these fees are still significantly below the average in the USA where merchants are charged approximately 2 per cent of the transaction value.

Next to the strict regulation of interchange fees, the European Commission also aims to reduce the risks of indebtedness through simple and strongly advertised credit accessibility and overdraft caps through the revision of the already existing Consumer Credit Directive. The strong efforts concerning capping overdraft fees in the European Union are remarkable, especially in the context of the much higher fees in the USA, where card companies have

7 Scheme fees are mostly unregulated charges that merchant acquirers pay to the operators of card payment schemes.

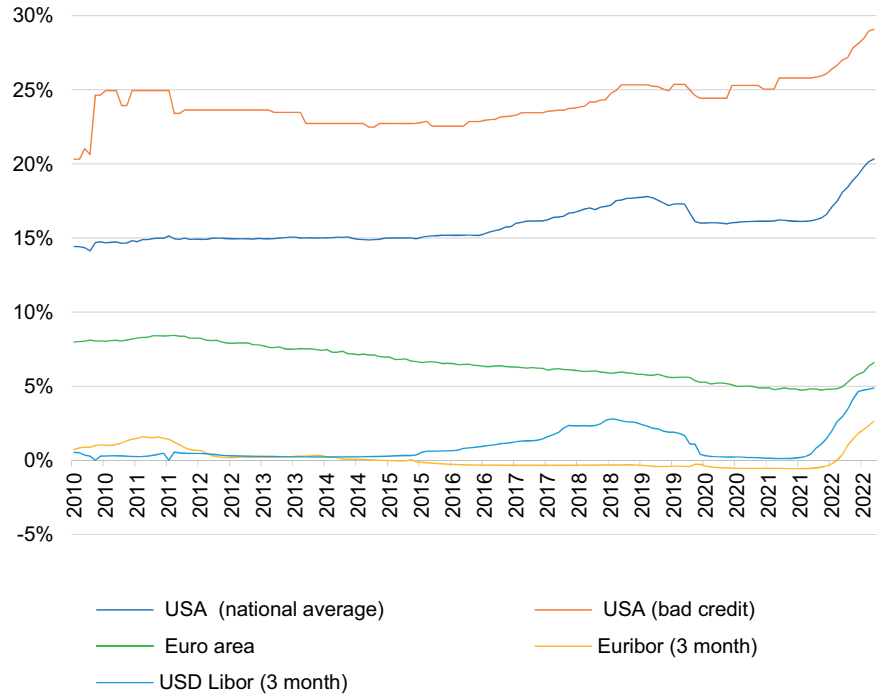

Figure 4. Credit card interest rates, June 2010–February 2023.
Data sources: For the USA (national average and bad credit): Dilworth and Tang (2023); for the euro area: Knops and Fromm (2022); for Euribor: ECB (2023a); for USD Libor: ECB (2023b).

avoided such caps under the pretext that they might inhibit access to credit for certain groups (Dlugosz, Melzer, and Morgan 2021) and thus reduce consumer credit's purported welfare-enhancing effect.

5. Public versus private payment infrastructure

As we have seen in the previous section, while the US government is reluctant to regulate the payment industry by capping fees that arise in the payment process, the European Union, which also covers the euro area, is rather active in regulating what costs should be passed on to consumers at what levels. In the regulatory balancing act, the European Union has acted in favor of consumers, especially those who appear to be more vulnerable, at the expense of profit-seeking card companies. But there is a flipside to this, which we discuss in this section: an incentive structure that makes it unattractive for private European players to provide a pan-European payment infrastructure that can compete with the one offered by US-based alternatives.

As already explained, the introduction of the giro networks at the beginning of the twentieth century in most European countries engendered payment infrastructures that enable relatively cheap and accessible transfers of money between private customers' bank accounts. These payment systems (such as Carte Bancaires in France or Girocard in

Germany) were later equipped to process debit and charge card payments. The economics of these national payment systems are generally much more favorable to consumers than those provided by credit card networks. For example, in Germany, the costs for making a €35 cashless payment are 1.1–1.3 per cent of the value if we use a credit card with a Visa or Mastercard brand. The costs for the same transaction executed with a Girocard are some 80 per cent lower (0.2 per cent of the transferred value) (CMSPI, n.d.). Although the concrete numbers differ between countries, the fundamental insight stays the same: Cashless transfers executed through national payment systems in the euro area are less expensive than transfers through credit card networks, because these infrastructures are provided, at least in part, by public actors.

By contrast, the USA never introduced giro networks and had to rely on the older, more cumbersome technology of check clearing (Leibbrandt 2004). While some efforts were made in the 1970s[8] to establish a payment infrastructure for retail payments, the infrastructures jointly provided by the Federal Reserve (Fed) and an association of banks[9] are so poorly designed that they can only be used for long-term, predictable transactions, such as payroll deposits or tax refunds. Although using these infrastructures is much cheaper than card payments, it has two serious disadvantages. These public–private infrastructures have historically been not only slow (settlement takes up to 3 days), which is primarily a problem for people who live from paycheck to paycheck, but also highly inconvenient, especially for the consumers, who usually must use handwritten checks (Conti-Brown and Wishnick 2020). It remains to be seen how the recent launching of FedNow, a public, flexible 24/7 platform that supports a broad variety of instant payments in the USA, will eventually alter the existing dynamics (Brainard 2022).

In sum, in Europe, many central banks and their respective national associations of banks jointly transformed the existing infrastructure (the giro networks) for transferring "big money" into a public–private payment infrastructure that meets the needs of the consumers for transferring "small money." In contrast, in the USA, until the launch of FedNow in July 2023, the lack of a publicly supported payment infrastructure created the ideal environment for the profit-seeking credit card companies to flourish and build a private infrastructure.

Furthermore, while the payment infrastructures of the individual European nation-states have many advantages, especially for consumers, they have one decisive disadvantage: they cannot process cross-border payments. This limitation became especially problematic in the context of European integration, bringing the national payment infrastructures increasingly under pressure. In the previous section, we already examined the failed attempt to create a pan-European solution for payments in the euro area. Meanwhile, cross-border card payments in Europe depend entirely on the two leading US credit card companies, Mastercard and Visa, which acquired Europay and Visa Europe, respectively. As a result, Visa and Mastercard have steadily increased their market share in pan-European payments, following network expansion through mergers and collaborations.

8 The most recent public intervention to enable faster payments between consumers and financial institutions is the creation of FedNow. FedNow is supposed to be released in the summer of 2023 and is a real-time payment system that will allow instant, 24/7 settlement between any banks with an account at the central bank. This will be the first improvement in the payment industry done by public actors since the launch of FedAch in 1972.

9 FedACH & Federal Reserve Check Services (US Department of the Treasury Report 2022).

Importantly, the credit card networks are not only challenging the relatively small market for cross-border payments within the euro area, but they are also threatening national card schemes. In many euro area countries, the national card networks were abandoned in the 2010s.[10] By 2018, only ten of the then nineteen euro area countries still had a national card scheme; countries without a domestic card scheme are mostly served exclusively by Visa or Mastercard (ECB 2014: 44; ECB 2019). In recent years, the market share of national card schemes has declined (Arnold 2021; Deutsche Bundesbank 2021: 15ff.; Storbeck 2021), while the share of payments processed by US-based card schemes.[11]

Especially since the 2010s, the rise of the power of credit card companies has been perceived by the European Commission and the European Central Bank (ECB) as alarming. The creation of a local pan-European payment solution for cards and online payments has been openly promoted in various public statements. Meanwhile, the ECB has also begun to explore another central bank-led payment innovation, the digital euro. While the central bank digital currency (CBDC) project in the USA is still in its infancy, the proposal for the digital euro is already highly developed. By its very nature, the digital euro would be a pan-European payment instrument. Irrespective of whether the digital euro could become a successful and convenient payment product, the ECB argues that through its mandatory provision and declaration as legal tender, it could leverage economies of scale more quickly than private sector projects (Bindseil, Panetta, and Terol 2021). ECB officials openly describe the digital euro as an extension of the public–private partnership between central banks and the private sector for the digital age (Panetta 2022). Though the digital euro has so far been mostly discussed in response to Facebook's Libra announcement, as a strategy for monetary sovereignty, we argue that the project is better understood as a reaction to the inability of the private sector to establish a common payment solution for the European market. Policymakers have urged the private sector to innovate on top of public payment infrastructures, to enhance competition, and to prevent the European payments market from being driven and integrated only by foreign actors (ECB 2019).

6. Conclusion

In this article, we have elaborated on the societal consequences of the gradual replacement of cash—the basic, publicly provided payment infrastructure—by digital alternatives.

10 For example, Luxembourg's bancomat in 2011; the Netherlands' PIN in 2012; Finland's pankkikortti in 2013; and Ireland's Laser in 2014 (Meyers 2021).

11 One factor that exacerbates the decline of national card schemes in Europe is a change in the policy of credit card companies regarding co-badging, which means the integration of two or more card brands or systems into one card. Both Visa and Mastercard used to allow the simultaneous use of the respective national payment systems for domestic payments and the credit card network for cross-border payments (Leibbrandt and De Terán 2021: 71). In 2021, however, Mastercard announced that it would end the co-badging of the national card networks such as Maestro (Nestler 2021) and is seeking to accelerate the use of its single-branded debit and credit cards. It is currently expected that Visa will also end V-pay (a European debit card issued by Visa that cooperates with the most important national payment networks), but no concrete date is known. This implies that European payment service providers will gradually lose influence on the market's development, and the dependency on US-based credit card providers will rise even further (ECB 2019).

Our general claim is that the replacement of cash by digital alternatives holds the potential to aggravate social inequality. While cash is by nature inclusive, since everyone has access to it under the same conditions, existing private non-cash alternatives such as credit cards are not. We claim that the interlinking of credit and payment was not only a crucial step in opening a huge stream of revenues for private cashless payment providers (especially credit card companies), but also an innovation that put consumers in a weaker position, thus further intensifying the negative effects attached to consumer credit.

Moreover, we show that the cashless revolution altered the incentive structure of the payment industry. Historically, the tendency toward market concentration was kept at bay by close collaboration between bank associations and central banks within national boundaries. Over time, the rise of global markets made these public–private alliances increasingly inadequate and fueled the development of a stable oligopoly of two credit card companies (Mastercard and Visa), which dominate payments in most Western countries. The predominance of these two players in providing such an essential infrastructure within the payment industry is not only a problem for anti-trust policy but it also entails greater societal problems.

Indeed, the societal consequences of the transition toward a cashless society are much more layered. In the USA, the replacement of cash by digital alternatives happened much more quickly than it did in the rest of the world. The wide acceptance of new technologies, the promotion of consumer credit as welfare, and the reluctance of the US government to intervene and rein in the payment sector built a perfect environment for the private payment industry to grow. This contributed to maintaining a financial system that does not serve the needs of at least one-fifth of the US population. While the payment industry and people with higher incomes benefit from this system, people with lower or lower middle incomes pay more—if they are included at all—and face disproportionately higher fees for consumer credits and transactions.

The euro area, on the other hand, faces a very different problem. The integration of the broader populace in the payment system is relatively secure, and the conditions for using these financial services result in much lower fees than in the USA. However, neither the private sector nor the public sector has been able to provide the infrastructure to integrate European cross-border payments. To put it bluntly, two American card companies essentially hold the euro area non-cash payments market together. The growing difficulties of providing an effectively working payment infrastructure are not only limited to pan-European payments. The national payment systems are increasingly challenged by the globally acting credit card companies that have become a superior competitor in the European market.

The deeper answer to the question about what social consequences arise from the replacement of cash by digital alternatives, however, touches on the design of the financial system as such. Modern banking is defined as uniting three types of financial services: payments, investments, and asset management. Since the latter two—traditionally involving "big money"—are inherently risky, profits are made by way of high volumes, and the benefits of providing these services are considered to outweigh the costs. By contrast, while the provision of payments—typically involving "small money"—is relatively safe, it requires extremely high investments in infrastructure, and benefits can only be made by achieving scale, a situation that leads inevitably in the long run to concentration tendencies. Given

these characteristics, there is a recurrent demand to institutionally detach payments from the other two banking functions (Omarova 2021).

In order to make payments profitable, private companies have transformed these transactions by adding credit to payment functions. The coupling of payment and credit aggravated the social inequality dynamics attached to the expansion of consumer credit. Additionally, the intrinsic tendency of the payment industry toward market concentration contributed to the rise of two powerful players, who can dictate the conditions for using payment infrastructures and having access to consumer credit. Paradoxically, the stricter regulation of payment fees has not lead to desirable situation either, since it only led to a situation where low-profit margins encouraged private players to stop providing cashless payment alternatives. A policy solution for such problems could be the stronger engagement of governments in the provision of payment infrastructure. The results of our research support this insight. In other words, using the terminology of our article, a payments infrastructure that was public in the first place should become public again if it is to avoid worsening social inequality.

Supplementary data

Supplementary data is available at *SOCECO Journal* online.

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