

Labat, Héctor; Seitz, Franz; Lepecq, Guillaume

Working Paper

Cash is more than a public good

Weidener Diskussionspapiere, No. 92

Provided in Cooperation with:

University of Applied Sciences Amberg-Weiden (OTH)

Suggested Citation: Labat, Héctor; Seitz, Franz; Lepecq, Guillaume (2024) : Cash is more than a public good, Weidener Diskussionspapiere, No. 92, ISBN 978-3-98638-006-9, Ostbayerische Technische Hochschule Amberg-Weiden (OTH), Weiden i.d.OPf.

This Version is available at:

<https://hdl.handle.net/10419/300659>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Die Hochschule im Dialog:

Cash is more than a Public Good

Héctor Labat
Franz Seitz
Guillaume Lepecq

Cash is more than a Public Good

Héctor Labat*, Franz Seitz⁺ & Guillaume Lepecq[#]

July 2024



*: CashEssentials, hector.labat@posteo.net

+: Technical University of Applied Sciences (OTH) Amberg-Weiden, f.seitz@oth-aw.de

#: CashEssentials, guillaume.lepecq@cashessentials.org

Deutscher Abstract:

Im vorliegenden Papier untersuchen wir die Frage, ob Bargeld ein öffentliches Gut ist und es ein Grundrecht auf Bargeldverwendung gibt. In einem strikten Sinne ist Bargeld kein öffentliches Gut, das in den Wirtschaftswissenschaften über Nicht-Rivalität im Konsum und Nicht-Anwendbarkeit des Ausschlussprinzips definiert wird. Allerdings trägt die Institution "Bargeld" zu einigen positiven gesellschaftlichen (mikro- und makroökonomischen) Entwicklungen bei, die öffentlichen Gutscharakter besitzen. Darunter fallen z. B. Anonymität und Schutz der Privatsphäre, Zahlungsmittelinklusion, Stabilisierungseigenschaften in Krisenphasen oder Sicherstellung des Wettbewerbs auf den Zahlungsverkehrsmärkten. Wenn das akzeptiert wird, impliziert dies eine stärkere Rolle des öffentlichen Sektors im Bargeldkreislauf. Dies sollte für eine intakte Bargeldinfrastruktur sorgen mit profitablen privaten Geschäftsmodellen. Es bedeutet jedoch nicht, dass es ein verfassungsrechtlich garantiertes Grundrecht auf Bargeld geben muss.

JEL: D02; E41; E42

Key words: cash; public good; basic right

ABOUT THIS PAPER

In September 2023, CashEssentials launched a research project addressing the questions ‘Is cash a public good? Is it a basic right?’ with the aim of clarifying the debate and advancing policies. Within this framework, Labat (2024) reviewed the literature on the topic, offering a comprehensive taxonomy to frame the discussion. A research seminar was then held in Istanbul on 6 November, bringing together a multidisciplinary panel of international specialists:

- Héctor Labat, Research Fellow, CashEssentials
- Tim Stuchtey Brandenburg Institute for Society and Security
- Frédéric Allemand, Robert Schuman Institute, University of Luxembourg
- Carin van der Cruijssen, De Nederlandsche Bank
- Franz Seitz, Weiden Technical University of Applied Sciences, Weiden
- Ursula Dalinghaus, Ripon College.

The present document summarizes the main take-aways of the research project and the discussions at the research seminar. We would like to extend our warm gratitude to both the panelists and the participants who have made this research possible

EXECUTIVE SUMMARY

1. Banknotes and coins constitute a form of public money as they are issued by a public institution, but like private money, serve private purposes, and thereby are not a public good per se. However, cash contributes to several social benefits which are of public interest:
 - The cash payments system and its collective benefits (financial and social inclusion, economic stabilisation, resilience of the payments and system, protection of privacy) are public goods in the economic sense. They are non-rivalrous in consumption, and nobody can be excluded from using them. Economic theory suggests that, without the participation of the government, their provision cannot be guaranteed.
 - Cash is a good of public access. Its tangibility makes it suitable for the elderly, the unbanked and groups at risk and makes it possible to use it without a device, third-party intermediation or being online. The public sector also issues and regulates cash to guarantee its public access and its widespread acceptance. Cash ensures universal access to the monetary system and economic life, promoting financial, social and payments inclusion of all.
 - Cash guarantees the respect of several rights deemed important for society, such as the right to privacy, freedom of choice and other civil liberties. In addition, it contributes to guaranteeing a more resilient and cohesive society. Thus, cash is a good of public interest.
2. Digital monies and electronic payment systems are only imperfect substitutes for cash in any of its societal roles:
 - Being digital, they cannot fully ensure privacy protection, economic inclusion and resilience to power outages, cyberattacks and crises.
 - Private monies and systems may contribute to efficiency but are profit-driven, which limits the extent to which they can contribute to the public good.
 - Central Bank Digital Currencies (CBDC) can be potentially designed to serve the interests of society in better ways than private alternatives do. However, due to their digital nature, they cannot deliver public benefits to the same extent than cash does.
3. The future of cash is not a just a technological issue as different forms of money have different implications for society. In order to preserve a resilient, inclusive and fair society, ensuring a well-functioning cash ecosystem is a matter of public interest. From a society's perspective, an efficient payment system is a mixture of both physical and digital instruments.

The collective benefits of cash contribute to the public good.

	PUBLIC ISSUER	INCLUSION	PROTECTION OF PRIVACY	ECONOMIC STABILISATION	RESILIENCE
PRIVATE MONEY	✗	✗	✗	✗	✗
CBDC	✓	?	?	?	✗
CASH	✓	✓	✓	✓	✓

4. The use of cash depends on the stability of the cash ecosystem to which both the private and the public sectors contribute. If the private sector disengages from its role, then the public sector must react to realign private interests with the public interest or fill the gap itself.
- The (active) use of cash must remain above a certain threshold to keep the cash infrastructure (access, acceptance, availability, affordability) alive and profitable for the private sector. The government can stimulate the use of cash through information campaigns that raise awareness of the societal benefits (positive externalities) of cash and new legislation favouring cash.
 - The cash system requires an appropriate legal framework and institutional support for cash to be trusted and credible. The government should strengthen cash access (cash deposit and withdrawal), convertibility (deposit into bank accounts) and acceptance rules to support the use of cash and, establish rights to access and pay in cash.

The cash infrastructure must be adapted to the needs of cash users, who otherwise will have no option but to shift to electronic payment alternatives. This would generate negative externalities in terms of financial inclusion, resilience of the payments infrastructure, the protection of privacy and civil liberties as well as economic stabilisation in the case of a crisis. The cash ecosystem and many of its collective benefits qualify as public goods as everyone can enjoy them simultaneously without restriction. If cash is not profitable for private providers, the government should fill the gap by, at least partly, funding the private sector or taking direct responsibility for its provision. In addition, it can set the scope for innovations that render the infrastructure more efficient.

1. INTRODUCTION

Demand for cash has been increasing in most countries, both in absolute terms and relative to GDP (Heinonen, 2023). However, the use of cash at the point of sale has been decreasing steadily in many countries in the last years in favour of electronic alternatives, a phenomenon that has become known as “the cash paradox” (Zamora-Pérez, 2021). Based on this, it is often claimed that consumers are making an active choice for more convenient and efficient digital forms of payment and that cash is becoming obsolete. However, further evidence suggests otherwise. Even in countries where cash represents a low share of transactions at points of sale, cash continues to be actively used by the majority of the population. Consumers typically prefer different means of payment for different transactions, thus using cash in parallel to other alternatives such as credit cards or mobile payments.

Moreover, most surveys around the world reveal that cash continues to be of great importance to people and that the hypothetical disappearance of cash is widely rejected by the public. In the euro area, the option to pay with cash is “important” or “very important” for 60% of the population¹. In the UK, around 17% of the population “would struggle to cope in a cashless society”², while 28% in the Netherlands “cannot do without cash” (van der Cruijssen & Reijerink, 2023). In France, 83% of people are worried about the possibility of cash disappearing³. These findings support the idea that electronic payment service providers play an important role in nudging consumers away from cash (Beretta & Neuberger, 2021).

Cash has some unique features that make it “virtually irreplaceable” (Dalinghaus, 2019). Cash is tangible, issued by public institutions and needs no intermediary to settle transactions. These features enable cash to provide a series of further unique benefits that, regardless of consumers’ individual choices, are important for society (Krueger & Seitz, 2017).

- Cash protects consumers’ privacy. Using cash requires no transaction records, unlike electronic means of payment, but only the physical transfer of banknotes and coins, which is difficult - albeit not impossible - to trace (Spaanderman, 2020).

¹ ECB’s SPACE survey.

² Cash Review Final Report, available at: <https://www.accesstocash.org.uk/media/1087/final-report-final-web.pdf>.

³ IFOP Annual Survey on cash.

- Cash constitutes a critical infrastructure. It can be a backup for electronic payment systems in case of breakdowns, power outages, natural disasters or cyberattacks⁴.
- Cash can also be the basis for a payments system that protects national sovereignty by granting independence from foreign payment service providers.
- Cash promotes competition in retail payments, which puts downward pressure on electronic payments' fees, notably payment cards.
- Cash plays a stabilising role in financial crises. Cash is trusted as the only truly tangible and public form of money. When uncertainty and mistrust in banks increase, the possibility of converting bank deposits into cash reasserts clients, helping to restore trust in the financial system (Rösl & Seitz, 2022).
- Cash guarantees the social inclusion of the population that struggle with electronic payments. In the absence of cash, groups at risk, such as the elderly, people with disabilities, those who are digitally illiterate⁵, low income or undocumented persons, would be virtually excluded from economic and social life (van der Crujisen & Reijerink, 2023).
- Cash is also convenient for budget management and controlling spending. This is especially important for people who find it difficult to make ends meet.
- Cash provides tourists and foreign visitors to a country with a certainty about being able to pay.

In light of these benefits, many qualify cash as a public good that has to be supported by the government or as a basic right that has to be protected by law (Labat, 2024). It is difficult to argue that banknotes and coins are themselves a public good or a basic right. However, some aspects of cash do involve elements of a public good nature and help safeguard certain individual rights. To better understand this, we need to consider cash as an ecosystem that is not just a set of physical tokens exchanged between individuals but also a payment system and an institution.

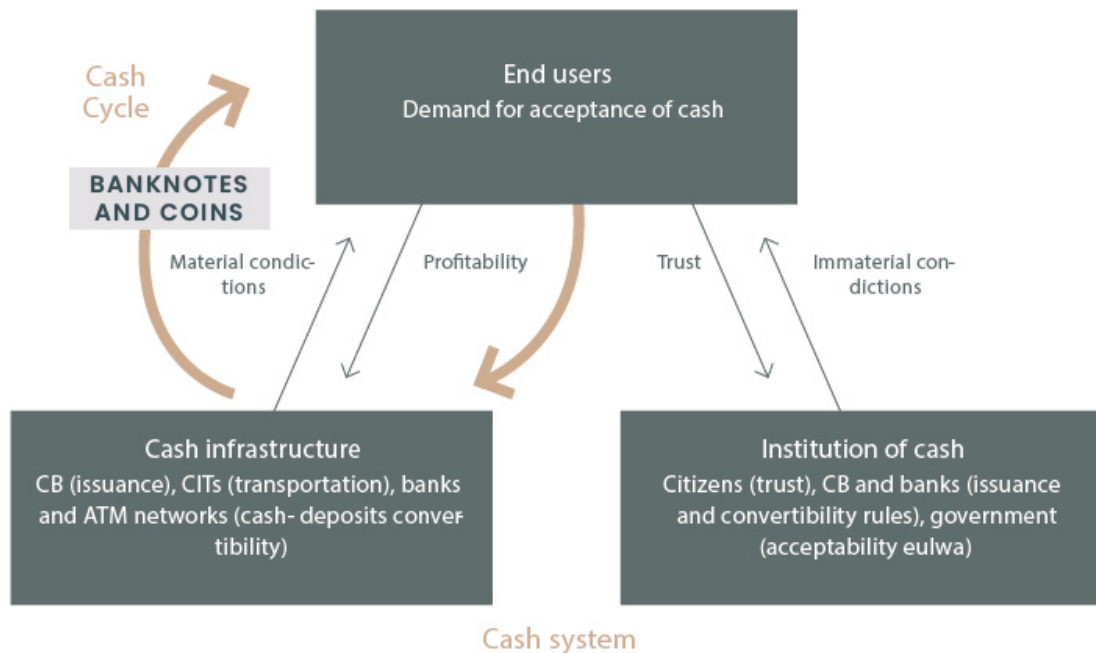
2. THE CASH ECOSYSTEM

Using cash is simple. Cash is typically used to educate children about the value and the logic of money. However, the use of cash relies on a complex supply chain involving many different actors and elements of society (see Figure 1).

⁴ Although cash payments are not dependent on electricity, cash distribution relies on an infrastructure that is also vulnerable to these risks. Nevertheless, if consumers keep an emergency cash reserve, as some governments recommend, cash payments become less dependent on the infrastructure. In addition, energy-autonomous mobile ATMs can also be deployed where needed.

⁵ According to Eurostat, 46% of people in the EU aged 16 to 74 didn't have basic overall digital skills in 2021.

FIGURE 1: THE CASH ECOSYSTEM



Notes: CB stands for central banks and CITs for cash-in-transit companies.
Source: Labat (2024).

First of all, the use of cash requires complex logistics. The *cash infrastructure* puts banknotes and coins into circulation, distributes and relocates them throughout the economy following the cash cycle (Figure 1, bottom left-hand side). The core of this infrastructure consists in:

- Central banks or monetary authorities issuing and providing cash to banks
- Cash-in-transit companies (CITs) transporting, distributing and recirculating cash
- Banks and non-bank providers operating the interface for cash withdrawals and deposits, through their branches and ATM networks that make cash accessible to the public
- Merchants who accept cash, provide change, and deposit cash into bank accounts

For the *cash payment system* to work, the cash infrastructure must be accompanied by a series of rules, principles and conventions regulating the issuance, convertibility and acceptance of cash: *the institution of cash* (Figure 1, bottom right-hand side).

- We can use cash because everyone trusts it as currency. Anyone that accepts cash does so because he is confident that others will later accept it in exchange for other goods and services (general acceptability).
- Trust in cash is supported by legislation, notably legal tender rules, and by the central bank which as the State's monetary authority must protect the value of cash and the stability of the monetary system

- Finally, a series of rules govern the issuance and convertibility of cash into bank deposits. Cash is issued by the central bank through the intermediary of commercial banks (McLeay et al., 2014; Banque de France, 2022). When clients withdraw cash from their bank deposits, the amount of banknotes and coins available to end users increases, but the money supply does not.

Cash exists in an *ecosystem* that relies on a certain balance between its participants. Any disruption in any of them affects the others and can destabilise the ecosystem endangering the use of cash.

The cash infrastructure and the institution of cash provide, respectively, the material (issuance, access and distribution) and immaterial conditions (trust and regulations) for end users to enjoy cash. Thus, an infrastructure that does not meet the needs of consumers and merchants may cause them to resort to more convenient alternatives. For instance, when merchants display ‘no cash’ signs it undermines consumer trust in the institution. The same is true when convertibility and acceptability rules are not advantageous enough for cash users.

The use of cash is subject to *network effects*: the more people use it, and the more merchants accept it, the more useful it is for current users, and the more attractive it becomes for prospective ones. The same principle driving this virtuous circle may cause a vicious spiral in which less use feeds back on itself. If big enough, it may undermine trust in the social convention of cash as universally accepted money.

How much people use cash also determines, to some extent, the size of the cash infrastructure, but other factors play a role as well such as seasonality, the need for a robust infrastructure as well as competition and interoperability. This infrastructure is mainly privately run and follows economic incentives: banks want to retain and attract clients while avoiding maintaining idle infrastructure. Less usage makes competition for cash services less important and renders the current infrastructure less profitable⁶. In addition, the fewer people use cash actively, the more the circulation of cash has to build upon the cash infrastructure, as cash received in payments is less likely to be directly used for further payments but re-deposited at banks (Krueger & Seitz, 2017).

⁶ Recent developments in the Netherlands and Sweden show that the cash infrastructure can shrink quite quickly.

3. PUBLIC GOODS AND BASIC RIGHTS IN THE CASH ECOSYSTEM

A well-functioning cash ecosystem gives rise to a series of elements that can be identified as *public goods* and *basic rights* that are deemed important to society. This suggests public support for the stability of the cash ecosystem, which, as we saw above, the private sector alone cannot guarantee. There are four approaches to qualify a good as *public* (Labat, 2024):

- In economics, *public goods* are consumed collectively in contrast to private goods, which are consumed individually. Public goods display two inherent features: (i) they are non-rivalrous because they can be consumed simultaneously without conflict and (ii) they are non-excludable as it is impossible to prevent any individual from consuming them. Public goods are prone to the *free-rider* problem: if consumers cannot be prevented from using them without paying, markets will under-produce them in relation to the social optimum, which justifies its provision by the State (directly or indirectly).

Most elements of the cash ecosystem are not public goods in the economic sense, as is the case for banknotes and coins and the cash infrastructure⁷. However, the cash system and many of its collective benefits qualify as public goods as everyone can enjoy them simultaneously without restriction (Davoodalhosseini & Rivadeneyra, 2018; Garratt & Oordt, 2021). Thus, public goods economic theory provides some basis for the State to protect the stability of the cash ecosystem.

- Outside economics, goods are also deemed *public* if they are universally accessible by law, in contrast to goods for which access is selective. Everyone can enjoy public (access) goods regardless of their personal condition. These goods are crucial for society as they establish equal conditions for every individual, contributing to strengthening social cohesion and the sense of citizenship. Granting public access to a good may be justified by a moral right or by the existence of positive externalities from which the whole society benefits. For example, universal access to education is considered a basic human right as it guarantees minimum conditions for everyone, while a more educated society is likely to be more prosperous.

Cash is a public (access) good as it constitutes the only part of the monetary system available to all individuals, poor and rich, abled and disabled, banked and unbanked alike (Dalinghaus, 2019). Therefore, the cash system has a crucial role in ensuring social cohesion and economic and social progress.

- Goods can also be deemed *public* when they contribute to the general or public interest, and private when they serve individual or private interests. This definition distinguishes what is good for the collective from what is bad from an ethical point of view. As private interests may not always align with public interests, the intervention

⁷ Two individuals cannot pay with the same banknote simultaneously (Chapman & Wilkins, 2019; Mangal, 2021). Meanwhile, although individuals and businesses can simultaneously use the cash infrastructure, the latter has limited capacity, which makes its consumption rival. Moreover, private providers can exclude clients through the fees they charge for their services. Even bank clients that enjoy free withdrawals at their bank's ATM networks pay indirectly for it through other fees or interest rate payments.

of the State may sometimes be necessary to protect society. For example, some private businesses and consumers may benefit from uncontrolled pollution, but its dire consequences for everyone make environmental legislation necessary.

Individuals use cash to pursue their private interests, which may or may not contribute to the common good. However, a well-functioning cash system allows several important rights to be respected, such as the right to privacy, the freedom to choose among different payment methods and the right to economic inclusion (Dalinghaus, 2019; ECB, 2023). Similarly, a stable ecosystem is of public interest as it yields collective benefits, such as protection against disruptions in digital payments and stabilisation in crises (Lepecq, 2015).

- From an administrative point of view, a good is *public* when it is managed by the State. The public sector does not need to follow the profit-based market principles but can pursue agreed collective goals. Thus, it can provide economic public goods that the market cannot, guarantee the universality of public access goods and promote goods of public interest for society.

Cash is public money in that it is issued by public institutions with public mandates. As the government sets the main rules that regulate the cash system, the governance of cash can be geared towards achieving the common good. However, the cash system also needs the private sector and relies on the alignment of private and public interests. Central banks mainly interact through financial intermediaries which follow their own market-driven interests. Similarly, cash distribution logistics are run by the private sector. Finally, cash acceptance requires trust and credibility of all stakeholders.

4. ELECTRONIC MONIES ARE NEITHER A *PUBLIC GOOD* NOR A *BASIC RIGHT*

Electronic monies and digital payment media are ubiquitous nowadays. Most of them are privately run, such as card schemes. Private monies have always co-existed with public money and been a source of innovation and efficiency gains. However, they tend to lack stability. Thus, most private payment systems do not rely on purely private monies. Trust on privately issued monies is contingent upon their convertibility at par into central bank money.⁸ Ultimately, people trust bank deposits because they can be converted at par into cash, which is currently the only form of public money available. More recently, central bank digital currencies (CBDCs) have appeared in the debate as a digital version of central bank money.

⁸ The government guarantees bank deposits up to a certain amount via deposit insurance and accepts them to discharge tax duties. Meanwhile, the central bank provides commercial banks with lender-of-last-resort facilities and supervises the stability of the banking and payment system.

Digital or electronic monies and payment systems may prove convenient for certain transactions and may contribute to economic efficiency. However, by design they cannot fulfil the important functions of cash that arise from its physical nature.

- They cannot ensure privacy, as they are not *anonymous* but at most *pseudonymous*. Typically, an alphanumeric code identifies each user.
- They are vulnerable to breakdowns, power outages and cyberattacks. As the supply chains grow increasingly complex, the vulnerabilities increase.
- They are not fully inclusive. Users need a device, typically a card or a smartphone which is costly. In addition, digital technology is not easy to use and not always suitable for groups at risk.

In addition, private issued monies and payment systems are primarily run in the pursuit of private interests. They are operated for profit. This is not inherently bad but makes them less capable of contributing to the public good than cash:

- Payment services are provided in exchange for fees, excluding those who cannot afford them. Thus, they cannot guarantee equal rights for everyone as the cash payment system does.
- The providers of private payment systems can sometimes compromise the interests of their clients, for example, through abusive fees or data collection.
- Fully private monies lack the backing of the State as representative of the public. Hence, trust in them tends to be more unstable and their value more volatile.
- There are segments that are simply not covered by digital payments - remote areas, areas with no electricity or network - as well as population groups - children, those without formal identification, or with a criminal record - who do not have access to digital forms of money.

The recent development of CBDC projects seeks to overcome the private-interest limitations of private monies and payment systems. Among the main arguments supporting central banks' research are putting downward pressure on fees by reinvigorating competition in retail payments, reducing reliance on foreign provision of payments systems and protecting monetary stability from the displacing of cash by private digital monies (Auer et al., 2020; BIS, 2018; ECB, 2023). However, even if CBDCs may beat private monies on these aspects, as digital money, CBDCs cannot match the physical features of cash.

- Universal access to CBDCs cannot be ensured without addressing financial or payments exclusion. Thus, as the ECB (2023, p. 34) acknowledges, "Barriers to [CBDC] inclusivity are not expected to differ from those observed for other digital payment solutions".

- CBDCs can be designed to ensure a great degree of anonymity. However, this cannot be absolute due to anti-money laundering rules and laws against terrorism financing (Sands, 2017; BIS, 2018; ECB, 2023). The potential “programmability” of CBDCs raises similar concerns (Prasad, 2023).
- An infrastructure that is not designed according to profitability goals can be more robust against power outages and cyberattacks, but not fully immune to them.
- As CBDCs may potentially compete with commercial bank deposits, one possible solution to protect the banking system’s stability is imposing caps on the CBDC balances that individuals can accumulate (Bank of Canada et al., 2020). However, such limits would undermine the use of digital public money for precautionary motives.
- CBDCs should only be used for transactional purposes, not for store-of-value or investment motives. This implies, it is more a competitor for private monies and payment media than for cash.

Thus, most central banks envisage CBDCs as complements, not substitutes of physical cash (ECB, 2023). In any case, CBDC projects are still at the research stage in most countries. The extent to which CBDCs may ultimately contribute to the public interest will importantly depend on their characteristics and whether they are trusted by the public. So far, the debate has been kept at a technical level and on supply-side considerations, and most citizens know very little about CBDCs.⁹ Most of all, the business case and the use case of CBDC are still not unambiguously pointed out.

5. CONCLUSION: ENSURING THE FUTURE STABILITY OF THE CASH ECOSYSTEM AND THE PAYMENT SYSTEM

If neither private nor public digital monies and electronic payment systems can substitute the societal functions of cash, then we need to guarantee the stability of the cash ecosystem. This is the only way to preserve the collective benefits of cash. Currently, the main destabilising force stems from the misalignment between private and public interests. The government can act on each of the three elements of the ecosystem to stabilise the cash ecosystem:

- Stimulating the use of cash can break the vicious feedback loop of less cash use, making the maintenance of the cash infrastructure more profitable for the private sector:

⁹ In Spain, only about 20% of people know anything about the ECB’s digital euro project (Banco de España, 2023). In France, the share barely reaches 10% (IFOP Annual Survey on cash).

- In parallel to promoting digital literacy to address financial exclusion, information programs could raise awareness on the societal importance of cash and stimulate its use and guarantee payments inclusion.¹⁰
- Meanwhile, it is important to assess carefully any other public endeavour that may potentially undermine the utility of cash, such as caps on cash payments and the risk of cash being partially displaced by CBDCs (BIS, 2018).
- Strengthening the institution of cash through new legislation that protects and promotes the use of cash:
 - Minimum access conditions (in terms of distance to an ATM, time to reach an ATM, withdrawal costs, etc.) can be established to ensure that the cash infrastructure meets societal needs.
 - The acceptability of cash can also be strengthened with new legislation that ensures that cash can be used at any point of sale under reasonable conditions.
 - The recognition of certain rights on cash, such as the right to access cash or the right to pay in cash, could back these legal changes.
- Counteracting the retreat of the private sector from the responsibility of maintaining an adequate infrastructure:
 - The government can fill the gap by subsidising banks or paying other companies to provide the service, as many municipalities are doing with ATMs in Spain, Belgium and France. If pertinent, the State could even run the necessary additional infrastructure itself.
 - The government can also increase the efficiency of the cash system by encouraging and promoting innovation. Many countries are implementing innovative solutions that could be exported to other countries. In New Zealand, the Reserve Bank is launching cash trials in communities lacking a commercial bank branch or an ATM to test new ways for people and retailers to withdraw and deposit cash, including change at little or no cost. Several countries, including Sweden, the Netherlands, and Ireland, are adopting legislation mandating that banks, or at least the large banks, ensure minimal access to cash. In the Netherlands, the largest banks have pooled their ATM network reducing their costs for maintaining the infrastructure. In Ireland, the UK and Australia post offices are widely used to withdraw and deposit cash. In Germany, Spain and Türkiye mobile branches are used to serve rural areas. Meanwhile, in a growing number of countries, a significant share of retailers offers cash-back and cash-in-shop services, as an alternative distribution channel to bank branches and ATMs

¹⁰ See, e.g., the “Initiative Cash” and the campaign “Truths about Cash” of the Mint of Austria (Münze Österreich).

REFERENCES

- Auer, R., Cornelli, G. & Frost, J. (2020). *Rise of the central bank digital currencies: Drivers, approaches and technologies* (880; BIS Working Papers). Bank for International Settlements.
- Bank of Canada, ECB, Bank of Japan, Sveriges Riksbank, Swiss National Bank, Bank of England, Board of Governors Federal Reserve System, & Bank for International Settlements (2020). *Central bank digital currencies: Foundational principles and core features* (1; Series of Collaborations from a Group of Central Banks). Bank for International Settlement.
- Banco de España (2023). Study on cash use habits.
- Banque de France (2022). *Paiements et infrastructures de marché à l'ère digitale*.
- Beretta, E. & Neuberger, D. (2021). The War on Cash: Institutional Hostility and Covid-19. *Cato Journal*, 41, 593.
- BIS (2018). *Central bank digital currencies*. Committee on Payments and Market Infrastructures, Bank for International Settlements.
- Chapman, J. & Wilkins, C. (2019). *Crypto 'money': Perspective of a couple of Canadian central bankers* (Staff Discussion Paper 2019–1). Bank of Canada.
- Dalinghaus, U. (2019). *Virtually irreplaceable: Cash as public infrastructure* [White paper]. Cash Matters.
- Davoodalhosseini, M. & Rivadeneyra, F. (2018). *A policy framework for e-money: A report on Bank of Canada Research* (Staff Discussion Paper 2018–5). Bank of Canada.
- European Central Bank (2023). *A stocktake on the digital euro—Summary report on the investigation phase and outlook on the next phase*. European Central Bank.
- Eurostat. How many people had basic digital skills in 2021.?
- Garratt, R. J. & Oordt, M. R. C. van. (2021). *Privacy as a Public Good: A Case for Electronic Cash*. *Journal of Political Economy*, 129(7), 2157–2180.
- Heinonen, A. (2023). *A Demand for Cash Under Uncertainty: A Global Update from 2020*. CashEssentials.
- Krueger, M. & Seitz, F. (2017). *The Benefits of Cash (Module 2)*. Fritz Knapp Publisher.
- Labat, H. (2024). *Is cash a public good? Is it a basic right? A critical examination of the debate*. Mimeo.
- Lepecq, G. (2015). *CashEssentials—Beyond Payments*. AGIS Consulting.
- Lepecq, G. & Lillberg, P. (2021). *The future of cash? A novel approach to re-imagining the future*. CashEssentials.
- Mangal, S. (2021). *Protecting Cash as a Public Good from Cashless Societies*. Strafasia. June 30.
- McLeay, M., Radia, A. & Thomas, R. (2014). *Money in the modern economy*. Bank of England Quarterly Bulletin, 2014 Q1, 14–28.

- Prasad, E. (2023, July 23). *Central banks must not be blind to the threats posed by CBDCs*. *Financial Times*. <https://www.ft.com/content/53b48346-1802-4164-bbdc-ccd034fa9ec>
- Rösl, G. & Seitz, F. (2022). *On the stabilizing role of cash for societies* Institute for Monetary and Financial Stability, Working Paper No. 167, June 2022.
- Sands, P. (2017). *The dark side of cash – facilitating crime and impeding monetary policy*. Deutsche Bundesbank (ed.), *War On cash: Is there a Future For cash?*, Conference Volume "International Cash Conference 2017. Seiters, Frankfurt am Main, 22–43.
- Spaanderman, J. (2020). *The role and future of cash*, De Nederlandsche Bank. Occasional Studies, Volume 18-2.
- van der Cruijssen, C. & Reijerink, J. (2023). *Uncovering the digital payment divide: Understanding the importance of cash for groups at risk* (Working Paper 781). De Nederlandsche Bank.
- Zamora-Pérez, A. (2021). *The paradox of banknotes: Understanding the demand for cash beyond transactional use*. *ECB Economic Bulletin*, 2/2021, 121–137.

Bisher erschienene Weidener Diskussionspapiere

- 1 „Warum gehen die Leute in die Fußballstadien? Eine empirische Analyse der Fußball-Bundesliga“
von Horst Rottmann und Franz Seitz
- 2 „Explaining the US Bond Yield Conundrum“
von Harm Bandholz, Jörg Clostermann und Franz Seitz
- 3 „Employment Effects of Innovation at the Firm Level“
von Horst Rottmann und Stefan Lachenmaier
- 4 „Financial Benefits of Business Process Management“
von Helmut Pirzer, Christian Forstner, Wolfgang Kotschenreuther und Wolfgang Renninger
- 5 „Die Performance Deutscher Aktienfonds“
von Horst Rottmann und Thomas Franz
- 6 „Bilanzzweck der öffentlichen Verwaltung im Kontext zu HGB, ISAS und IPSAS“
von Bärbel Stein
- 7 Fallstudie: „Pathologie der Organisation“ – Fehlentwicklungen in Organisationen, ihre Bedeutung und Ansätze zur Vermeidung
von Helmut Klein
- 8 „Kürzung der Vorsorgeaufwendungen nach dem Jahressteuergesetz 2008 bei betrieblicher Altersversorgung für den GGF.“
von Thomas Dommermuth
- 9 „Zur Entwicklung von E-Learning an bayerischen Fachhochschulen- Auf dem Weg zum nachhaltigen Einsatz?“
von Heribert Popp und Wolfgang Renninger
- 10 „Wie viele ausländische Euro-Münzen fließen nach Deutschland?“
von Dietrich Stoyan und Franz Seitz
- 11 Modell zur Losgrößenoptimierung am Beispiel der Blechteilindustrie für Automobilzulieferer
von Bärbel Stein und Christian Voith
- 12 Performancemessung
Theoretische Maße und empirische Umsetzung mit VBA
von Franz Seitz und Benjamin R. Auer
- 13 Sovereign Wealth Funds – Size, Economic Effects and Policy Reactions
von Thomas Jost

- 14 The Polish Investor Compensation System Versus EU – 15 Systems and Model Solutions
von Bogna Janik
- 15 Controlling in virtuellen Unternehmen -eine Studie-
Teil 1: State of the art
von Bärbel Stein, Alexander Herzner, Matthias Riedl
- 16 Modell zur Ermittlung des Erhaltungsaufwandes von Kunst- und Kulturgütern in
kommunalen Bilanzen
von Bärbel Held
- 17 Arbeitsmarktinstitutionen und die langfristige Entwicklung der Arbeitslosigkeit –
Empirische Ergebnisse für 19 OECD-Länder
von Horst Rottmann und Gebhard Flaig
- 18 Controlling in virtuellen Unternehmen -eine Studie-
Teil 2: Auswertung
von Bärbel Held, Alexander Herzner, Matthias Riedl
- 19 DIAKONIE und DRG's –antagonistisch oder vereinbar?
von Bärbel Held und Claus-Peter Held
- 20 Traditionelle Budgetierung versus Beyond Budgeting-
Darstellung und Wertung anhand eines Praxisbeispiels
von Bärbel Held
- 21 Ein Factor Augmented Stepwise Probit Prognosemodell
für den ifo-Geschäftserwartungsindex
von Jörg Clostermann, Alexander Koch, Andreas Rees und Franz Seitz
- 22 Bewertungsmodell der musealen Kunstgegenstände von Kommunen
von Bärbel Held
- 23 An Empirical Study on Paths of Creating Harmonious Corporate Culture
von Lianke Song und Bernt Mayer
- 24 A Micro Data Approach to the Identification of Credit Crunches
von Timo Wollmershäuser und Horst Rottmann
- 25 Strategies and possible directions to improve Technology
Scouting in China
von Wolfgang Renninger und Mirjam Riesemann
- 26 Wohn-Riester-Konstruktion, Effizienz und Reformbedarf
von Thomas Dommermuth
- 27 Sorting on the Labour Market: A Literature Overview and Theoretical Framework
von Stephan O. Hornig, Horst Rottmann und Rüdiger Wapler
- 28 Der Beitrag der Kirche zur Demokratisierungsgestaltung der Wirtschaft
von Bärbel Held

- 29 Lebenslanges Lernen auf Basis Neurowissenschaftlicher Erkenntnisse
-Schlussfolgerungen für Didaktik und Personalentwicklung-
von Sarah Brückner und Bernt Mayer

- 30 Currency Movements Within and Outside a Currency Union: The case of Germany
and the euro area
von Franz Seitz, Gerhard Rösl und Nikolaus Bartzsch

- 31 Labour Market Institutions and Unemployment. An International Comparison
von Horst Rottmann und Gebhard Flaig

- 32 The Rule of the IMF in the European Debt Crisis
von Franz Seitz und Thomas Jost

- 33 Die Rolle monetärer Variablen für die Geldpolitik vor, während und nach der Krise:
Nicht nur für die EWU geltende Überlegungen
von Franz Seitz

- 34 Managementansätze sozialer, ökologischer und ökonomischer Nachhaltigkeit:
State of the Art
von Alexander Herzner

- 35 Is there a Friday the 13th effect in emerging Asian stock markets?
von Benjamin R. Auer und Horst Rottmann

- 36 Fiscal Policy During Business Cycles in Developing Countries: The Case of Africa
von Willi Leibfritz und Horst Rottmann

- 37 MONEY IN MODERN MACRO MODELS: A review of the arguments
von Markus A. Schmidt und Franz Seitz

- 38 Wie erzielen Unternehmen herausragende Serviceleistungen mit höheren Gewinnen?
von Johann Strassl und Günter Schicker

- 39 Let's Blame Germany for its Current Account Surplus!?
von Thomas Jost

- 40 Geldpolitik und Behavioural Finance
von Franz Seitz

- 41 Rechtliche Überlegungen zu den Euro-Rettungsschirmprogrammen und den
jüngsten geldpolitischen Maßnahmen der EZB
von Ralph Hirdina

- 42 DO UNEMPLOYMENT BENEFITS AND EMPLOYMENT PROTECTION INFLUENCE
SUICIDE MORTALITY? AN INTERNATIONAL PANEL DATA ANALYSIS
von Horst Rottmann

- 43 Die neuen europäischen Regeln zur Sanierung und Abwicklung von Kreditinstituten:
Ordnungspolitisch und rechtlich angreifbar?
von Ralph Hirdina
- 44 Vermögensumverteilung in der Eurozone durch die EZB ohne rechtliche Legitimation?
von Ralph Hirdina
- 45 Die Haftung des Steuerzahlers für etwaige Verluste der EZB auf dem rechtlichen Prüfstand
von Ralph Hirdina
- 46 Die Frage nach dem Verhältnis von Nachhaltigkeit und Ökonomie
von Alexander Herzner
- 47 Giving ideas a chance - systematic development of services in manufacturing industry
von Johann Strassl, Günter Schicker und Christian Grasser
- 48 Risikoorientierte Kundenbewertung: Eine Fallstudie
von Thorsten Hock
- 49 Rechtliche Überlegungen zur Position der Sparer und institutionellen Anleger mit Blick auf
die Niedrigzins- bzw. Negativzinspolitik der Europäischen Zentralbank
von Ralph Hirdina
- 50 Determinanten des Studienerfolgs: Eine empirische Untersuchung für die Studiengänge
Maschinenbau, Medienproduktion und -technik sowie Umwelttechnik
von Bernd Rager und Horst Rottmann
- 51 Cash Holdings in Germany and the Demand for "German" Banknotes:
What role for cashless payments
von Nikolaus Bartsch und Franz Seitz
- 52 Europäische Union und Euro – Wie geht es weiter? – Rechtliche Überlegungen
von Ralph Hirdina
- 53 A Call for Action – Warum sich das professionelle Management des Service Portfolios in der
Industrie auszahlt
von Günter Schicker und Johann Strassl
- 54 Der Studienerfolg an der OTH Amberg-Weiden – Eine empirische Analyse der Studiengänge
Maschinenbau, Medienproduktion und Medientechnik sowie Umwelttechnik
von Bernd Rager und Horst Rottmann
- 55 Die Bewertung von Aktienanleihen mit Barriere – Eine Fallstudie für die Easy-Aktienanleihe
der Deutschen Bank
von Maurice Hofmann und Horst Rottmann
- 56 Studie: Die Generation Y und deren organisatorische Implikationen
von Helmut Klein

- 57 Die gesetzliche Einschränkung von Bargeldzahlungen und die Abschaffung von Bargeld auf dem rechtlichen Prüfstand
von Ralph Hirdina
- 58 Besser ohne Bargeld? Gesamtwirtschaftliche Wohlfahrtsverluste der Bargeldabschaffung
von Gerhard Rösl, Franz Seitz, Karl-Heinz Tödter
- 59 Nowcasting des deutschen BIP
von Jens Doll, Beatrice Rosenthal, Jonas Volkenand, Sandra Hamella
- 60 Herausforderungen und Erfolgsfaktoren bei der Einführung Cloud-basierter Unternehmenssoftware – Erfahrungen aus der Praxis
von Thomas Dobat, Stefanie Hertel, Wolfgang Renninger
- 61 Global Recessions and Booms: What do Probit models tell us?
von Ursel Baumann, Ramón Gómez Salvador, Franz Seitz
- 62 Feste Zinsbindung versus kurzfristig variable Zinskonditionen in Deutschland
von Jörg Clostermann und Franz Seitz
- 63 Deferred-Compensation-Modelle: Ersatz für eine konventionelle betriebliche Altersversorgung nach dem Betriebsrentengesetz?
von Thomas Dommermuth und Thomas Schiller
- 64 Have capital market anomalies worldwide attenuated in the recent era of high liquidity and trading activity?
von Benjamin R. Auer und Horst Rottmann
- 65 Vorschläge des französischen Staatspräsidenten Emmanuel Macron zur Reform der Europäischen Union
von Ralph Hirdina
- 66 Von der Troika zu einem Europäischen Währungsfonds – Welche Aufgaben und Grenzen sollte ein Europäischer Währungsfonds nach den Erfahrungen mit der Troika haben?
von Thomas Jost
- 67 Does Microfinance have an impact on borrower's consumption patterns and women's empowerment?
von Charlotte H. Feldhoff, Yi Liu und Patricia R. Feldhoff
- 68 Uncertainty in the Black-Litterman Model - A Practical Note
von Adrian Fuhrer und Thorsten Hock
- 69 Produktportfolio-Management im Zeitalter der Digitalisierung
von Günter Schicker und Johann Strassl
- 70 Evaluation eines Inverted Classroom Konzepts in der makroökonomischen Lehre
von Horst Rottmann und Christoph Voit
- 71 Immobilienkredite in Deutschland und der Schweiz: Die Rolle von Zinsen und Zinsbindung
von Jörg Clostermann und Franz Seitz

- 72 Intelligente Verpackungen
 von Stephanie Abels-Schlosser
- 73 Digitale Strategien entwickeln – von der Idee zur Roadmap
 von Johann Strassl und Günter Schicker
- 74 Derivate im Zinsmanagement: Eine Analyse der Hedging-Qualität von Bund Future
 Kontrakten und deren Einsatzmöglichkeiten in Theorie und Praxis
 von Christoph Wontke und Franz Seitz
- 75 Steigerung der Kundenzufriedenheit durch Gestaltung von Artikeldetailseiten
 am Beispiel von WITT WEIDEN
 von Laura Graser und Marco Nirschl
- 76 Werkvertragsarbeitnehmerinnen und -arbeitnehmer in der Fleischindustrie
 von André Schulte und Ágnes Wörster
- 77 How to avoid fracture of the locking screw in modular revision arthroplasty of the hip using
 the MRP Titan Revision System
 von Theresa Semmelmann, Alexander Schuh, Horst Rottmann, Reinhard Schröder,
 Christopher Fleischmann
- 78 SARS-Cov-2 und Bargeld: Wie ein Virus die weltweite Bargeldnachfrage fördert
 von Gerhard Rösl und Franz Seitz
- 79 Monte-Carlo-Evaluation von Instrumentenvariablenschätzern
 von Benjamin R. Auer und Horst Rottmann
- 80 Euro area house price fluctuations and unconventional monetary policy surprises
 von Oliver Hülsewig und Horst Rottmann
- 81 Euro Area Periphery Countries' Fiscal Policy and Monetary Policy Surprises
 von Oliver Hülsewig und Horst Rottmann
- 82 Überschätzen sich jüngere Personen mehr als ältere? Der Dunning-Kruger-Effekt im
 Altersvergleich
 von V. Benesch, M. Godde, B. Hammami, U. Laufkötter, M. Seidel und B. Mayer
- 83 Cash demand in times of crises
 von Gerhard Rösl und Franz Seitz
- 84 The relevance of banks to the European stock market
 von Andreas Kick und Horst Rottmann
- 85 CBDC and Cash in the Euro Area: Crowding out or co-circulation?
 von Gerhard Rösl und Franz Seitz
- 86 Nutztierwirtschaft zwischen Tierwohl, Unternehmensstrategie und Verbraucherinteresse –
 Spannungsfeld oder Zukunftschance im Agrarsektor?
 von André Schulte und Ágnes Wörster

- 87 Zentralbankverluste und „ungerechte (?)“ Bankengewinne infolge der Wertpapieraufkaufprogramme und der Verzinsung der Überschussreserven von Thomas Jost
- 88 On the protective effects of European sustainable stocks during the Russian invasion of Ukraine von Andreas Kick und Horst Rottmann
- 89 Agrarökonomische Diskurse im Kontext demokratischer Legitimation, politischer Notwendigkeit und bürgerlicher Partizipation: Über Einkommensverhältnisse und ausgewählte Herausforderungen in der Landwirtschaft von André Schulte und Ágnes Wörster
- 90 Inflation-induced Liquidity Constraints in Real Estate Financing von Andrea Gubitz, Karl-Heinz Toedter und Gerhard Ziebarth
- 91 Monetary and Macroprudential Policies with Direct and Indirect Financing: Implications for Macroeconomic Stability von Jan Bruch, Franz Seitz und Uwe Vollmer
- 92 Cash is more than a Public Good von Héctor Labat, Franz Seitz und Guillaume Lepecq



Ostbayerische Technische Hochschule
Amberg-Weiden

Die Weidener Diskussionspapiere erscheinen in unregelmäßigen Abständen und sollen Erkenntnisse aus Forschung und Wissenschaft an der Hochschule in Weiden insbesondere zu volks- und betriebswirtschaftlichen Themen an Wirtschaft und Gesellschaft vermitteln und den fachlichen Dialog fördern.

Herausgeber:

Ostbayerische Technische Hochschule (OTH) Amberg-Weiden
Prof. Dr. Horst Rottmann und Prof. Dr. Franz Seitz
Fakultät Betriebswirtschaft

Presserechtliche Verantwortung:

Sonja Wiesel, Hochschulkommunikation und Öffentlichkeitsarbeit
Telefon +49 (9621) 482-3135
Fax +49 (9621) 482-4135
s.wiesel@oth-aw.de

Bestellungen schriftlich erbeten an:

Ostbayerische Technische Hochschule Amberg-Weiden
Abt. Weiden, Bibliothek
Hetzenrichter Weg 15,
D – 92637 Weiden i.d.Opf.

Die Diskussionsbeiträge können elektronisch abgerufen werden unter
http://www.oth-aw.de/aktuelles/veroeffentlichungen/weidener_diskussionspapiere/

Alle Rechte, insbesondere das Recht der Vervielfältigung und Verbreitung sowie Übersetzung vorbehalten.
Nachdruck nur mit Quellenangabe gestattet.

ISBN 978-3-98638-006-9

- Abteilung Amberg: Kaiser-Wilhelm-Ring 23, 92224 Amberg,
Tel.: (09621) 482-0, Fax: (09621) 482-4991
- Abteilung Weiden: Hetzenrichter Weg 15, 92637 Weiden i. d. OPf.,
Tel.: (0961) 382-0, Fax: (0961) 382-2991
- E-Mail: info@oth-aw.de | Internet: <http://www.oth-aw.de>