

# Digital Euro or Bitcoin: How will we pay in the future?

Master Seminar WS22/23

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## Prerequisites:

Topic needs to ask and answer a research question that can be answered given time, effort and informational constraints

## How-To:

Seminar paper should optimally create new information by gathering data.

1. Scientific literature review
2. Qualitative methods (e.g. interviews)
3. Quantitative methods (e.g. surveys)
4. Programming/modelling

## Structure:

- Introduction and Background
- Related Work and Methodology
- Results and Discussion
- Limitations and Future Work
- Conclusion

## Preliminary list of possible topics:

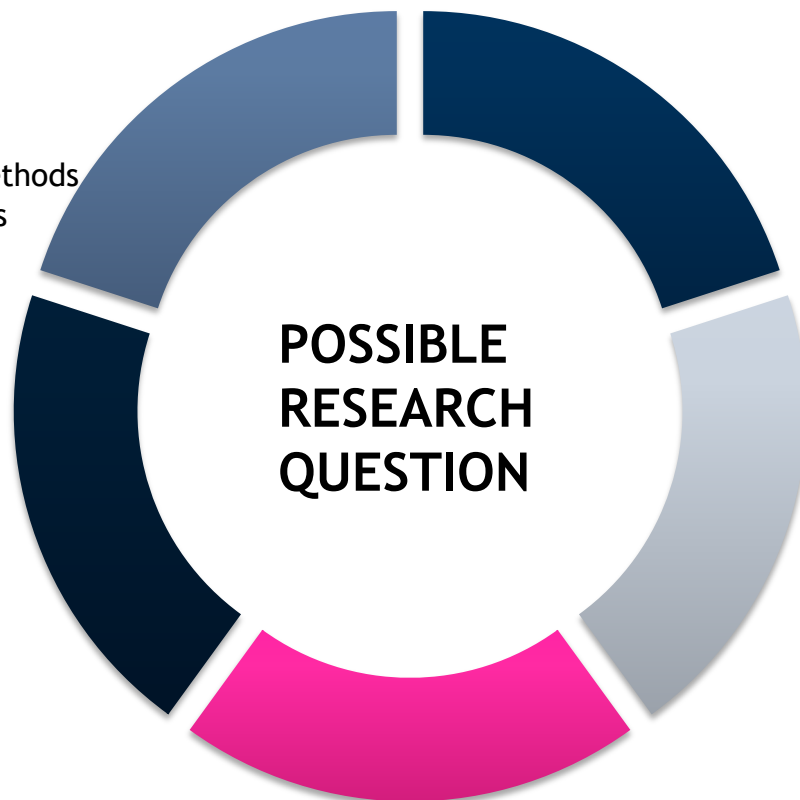
- Culture and Payment Behavior
- Influence of payment methods on spending behavior
- Stablecoins
- Money Laundering
- CBDC: Central Banks
- CBDC: Academic Research
- Trust in Money
- Legal Analysis on Crypto/CBDC
- CBDC: Adoption
- Ethical Design Principles
- Contextual Integrity and Payments
- *Your own ideas are welcome!*

## PAYMENT METHOD

- Cash
- Credit/Debit cards
- Digital (Mobile) Payment Methods
- Cryptocurrency/ Stablecoins
- CBDC

## PERSPECTIVE

- User (Retail, Wholesale)
- Technology provider
- Central banks
- Retail banks
- Society
- Government
- PSPs
- Third parties



**POSSIBLE  
RESEARCH  
QUESTION**

## DOMAIN

- Technical
- Legal
- Economic
- Monetary
- Financial
- Management/ Marketing
- Societal / Cultural
- Ethical

## FACTORS

- (Technology) adoption
- Trust
- Privacy (concerns)
- Security (concerns)
- Trends and Ecosystems
- Scientific overview
- Attitudes
- Auditability/ AML/CFT
- Offline payments

## DATA

- Qualitative
- Quantitative
- Blockchain
- Financial
- Theory

# Culture and Payment Behavior

## Context:

- Culture and other socio and demographic factors play an important role in technology adoption and payment usage.

## To-Do:

- Review literature from other disciplines on this subject. Research this topic in more detail by creating a list/framework for socio- and demographic factors in digital payment systems. Case studies could discuss differences between countries / cultures, e.g. through interviews and survey



## References:

- Vinitha, K., & Vasantha, S. (2017). Influence of demographic variables on usage of e-payment system. *Int J Mech Eng Technol (IJMET)*, 8, 265-276.

# Influence of payment methods on spending behavior

## Context:

- Spending behavior of individuals differs depending on cash or card payments. However, the influence of mobile, digital and new payment methods are lacking research.



## To-Do:

- Literature review on the link of spending behavior and payment methods. Development of a survey to study this phenomenon for cryptocurrency / CBDC payments in the future. Or interviews to develop a framework and identify important factors.

## References:

- Qian, R., & Palvia, P. (2022). The Impact of Mobile Payment on Consumer Behavior: A Unified Model.
- Van der Horst, F., & Matthijsen, E. (2013). The irrationality of payment behaviour. *DNB Occasional Studies*, 11(4).
- Runnemark, E., Hedman, J., & Xiao, X. (2015). Do consumers pay more using debit cards than cash?. *Electronic Commerce Research and Applications*, 14(5), 285-291.

## Context:

- Stablecoins are cryptocurrencies that aim to hold a certain, stable value. There exist various financial and technical options on how to achieve and maintain such a stable value.

## To-Do:

- **Literature review** on the technical functioning of stablecoins and there analysis in both, central bank and academic research. **Data analysis** on their actual use for what kind of use cases. Possible case studies of failed stablecoins.

## References:

- Moin, A., Sekniqi, K., & Sirer, E. G. (2020, February). SoK: A classification framework for stablecoin designs. In International Conference on Financial Cryptography and Data Security (pp. 174-197). Springer, Cham.

## Context:

- The compliance with Anti-money-laundering (AML) and counter-financing-terrorism (CFT) regulation is a crucial job for banks. Cryptocurrency, and also CBDC, provide new challenges in this regard.

## To-Do:

- **Literature review** on money laundering and AML/CFT regulation in digital payment systems. Analysis on how AML/CFT compliance could be ensured in cryptocurrencies/CBDC. Focus on the challenges of blockchain technology and the creation of large amounts of data.

## References:

- Barone, R., & Masciandaro, D. (2019). Cryptocurrency or usury? Crime and alternative money laundering techniques. *European Journal of Law and Economics*, 47(2), 233-254.
- Al-Tawil, T.N. (2022), "Anti-money laundering regulation of cryptocurrency: UAE and global approaches" *Journal of Money Laundering Control*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JMLC-07-2022-0109>
- M. -Y. Day, P. -T. Chiu, Y. -W. Teng and C. -L. Liu, "Developing Relation Types of Cryptocurrency Anti-Money Laundering Knowledge Graph," 2022 IEEE 23rd International Conference on Information Reuse and Integration for Data Science (IRI), 2022, pp. 90-94, doi: 10.1109/IRI54793.2022.00031.

## **Context:**

- Worldwide, nearly every central bank is researching CBDC. The focus and status of this research differs strongly between countries, from the type of CBDC, to its technology and status of implementation.

## **To-Do:**

- Literature review on CBDC in central bank research. Creation of a status quo map that is more comprehensive than current CBDC tracking websites. Possibly developed as an updatable website.

## **References:**

- <https://cbdctracker.org>
- [https://www.ecb.europa.eu/paym/digital\\_euro/html/index.en.html](https://www.ecb.europa.eu/paym/digital_euro/html/index.en.html)



# Update on Research on CBDC

## Context:

- The amount of scientific literature on CBDC has grown tremendously in recent years with research focusing on different aspects of the topic

## To-Do:

- **Literature review** on CBDC in general to provide an update on the topic. Find suitable categories to cluster research and provide insights into how research has changed, gaps in the literature and the most recent results.



## References:

- Vom Brocke, J., Simons. Reconstructing the Giant: On the importance of rigour in documenting the literature search. Ecis. (2009). <https://doi.org/10.1108/09600031211269721>.
- Tronnier, F., Recker, M., & Hamm, P. (2020). Towards Central Bank Digital Currency–A Systematic Literature Review.
- Ozili, P. K. (2022). Central bank digital currency research around the World: a review of literature. Journal of Money Laundering Control.

## Context:

- Trust is a core prerequisite for a functional currency and an important factor in academic research. While technology adoption is widely used in information systems, trust in money is researched superficially.

## To-Do:

- Literature review on trust in money and trust in digital payment systems. Create a new framework for trust in digital money (possibly through interviews) and/or evaluate it (possibly through a survey)
- How could trust be fostered for CBDC?



## References:

- Schnabel, I., Shin, H.S.: Money and trust: Lessons from the 1620s for money in the digital age. BIS Work. Pap. (2018).
- Bursian, D., Fürth, S.: Trust Me! I am a European Central Banker. J. Money, Credit Bank. 47, 1503–1530 (2015).
- Wonneberger, E.T., Mieg, H.A.: Trust in money: hard, soft and idealistic factors in Euro, gold and German community currencies. J. Sustain. Financ. Invest. 1, 230–240 (2011). <https://doi.org/10.1080/20430795.2012.655891>.
- Mallard, A., Méadel, C., Musiani, F., Mallard, A., Méadel, C., Musiani, F., Paradoxes, T., Mallard, A., Méadel, C., Musiani, F.: The Paradoxes of Distributed Trust : Peer-to-Peer Architecture and User Confidence in Bitcoin To cite this version : HAL Id : hal-00985707 The Paradoxes of Distributed Trust : Peer-to-Peer Architecture and User Confidence in Bitcoin. (2018).

# Legal Analysis on Cryptocurrency / CBDC

## Context:

- The EU and other nations are in the process of cryptocurrency/stablecoins and discuss the future regulation of CBDC. A wide range of laws and regulations exist that need to be considered by banks and PSPs.

## To-Do:

- **Literature review** on legal issues and gaps on the subject. Overview on the main regulations and their consequences for the payment market.



## References:

- [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698803/EPRS\\_BRI\(2021\)698803\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698803/EPRS_BRI(2021)698803_EN.pdf)
- MiCa: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Markets in Crypto-assets

# Design Principles for Ethical CBDC / Cryptocurrency Development

## Context:

- CBDC and cryptocurrency have the power to change the payment system. Yet, ethical aspects are hardly discussed, in particular not in the development of these technologies.

## To-Do:

- Literature review on ethical considerations in currencies and payment systems. Discussion of possible ethical issues for CBDC/cryptocurrency and the development of a framework for the ethical development of these technologies (**Design Science Research Approach**)

## References:

- Torno, A., Dreyer, M., Torno, A., Dreyer, M.: Taming the Next Wolf of Wall Street – Design Principles for Ethical Robo-Advice Taming the Next Wolf of Wall Street – Design Principles for Ethical Robo-Advice Completed Research Paper. (2022).

## Context:

- Cryptocurrency and CBDC adoption have been widely discussed in recent literature. There exist a wide range of models to study adoption (TAM, UTAUT, UTAUT2). However, research on models to study the adoption of money is scarce.

## To-Do:

- **A:** Literature review on technology adoption on CBDC and cryptocurrency. How do the results compare? Create a new model to study money/currency adoption (and test it using a survey).
- **B:** Study cryptocurrency/CBDC adoption through interviews/surveys in suitable countries: Venezuela (Bitcoin), China (CBDC)

## References:

- Bijlsma, M., van der Crujisen, C., Jonker, N., & Reijerink, J. (2021). What triggers consumer adoption of CBDC?.
- Jiang, J. H. (2020). *CBDC adoption and usage: some insights from field and laboratory experiments* (No. 2020-12). Bank of Canada.
- Tronnier, F., & Kakkar, S. (2021). Would You Pay with a Digital Euro? Investigating Usage Intention in Central Bank Digital Currency. Investigating Usage Intention in Central Bank Digital Currency (August 18, 2021).

# Contextual Integrity and Payments

## Context:

- Contextual integrity (CI) theory by Nissenbaum, 2010 states that privacy is context dependent. This means that changes on contextual parameters influences privacy norms and can lead to perceived privacy violations.

## To-Do:

- Apply the contextual integrity framework towards digital payment methods. Research whether CI can also be applied towards factors other than privacy, e.g. security and trust. Design a survey to study CI on these factors for digital payment methods.

## References:

- Nissenbaum, H. (2009). Privacy in context. In *Privacy in Context*. Stanford University Press.
- Non-public research paper by Tronnier, 2023
- Apthorpe, N., Shvartzshnaider, Y., Mathur, A., Reisman, D., Feamster, N.: Discovering Smart Home Internet of Things Privacy Norms Using Contextual Integrity. *Proc. ACM Interactive, Mobile, Wearable Ubiquitous Technol.* 2, 1–23 (2018). <https://doi.org/10.1145/3214262>.

## Other. Your own ideas

- Do you have own ideas regarding digital payment methods, cryptocurrency or CBDC?
- Think about open issues and open questions that have not been answered yet.



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