

DOI: [10.55643/fcaptop.3.62.2025.4734](https://doi.org/10.55643/fcaptop.3.62.2025.4734)

Viktor Koziuk

D.Sc. in Economics, Professor of the Department of Economics and Economic Theory, West Ukrainian National University, Ternopil, Ukraine; ORCID: [0000-0002-5715-2983](https://orcid.org/0000-0002-5715-2983)

Yurii Ivashuk

Candidate of Economy Sciences, Associate Professor of the Department of Economics and Economic Theory, West Ukrainian National University, Ternopil, Ukraine; e-mail: yvavashuk@gmail.com ORCID: [0000-0002-8459-4744](https://orcid.org/0000-0002-8459-4744) (Corresponding author)

Yurii Haida

D.Sc. in Agricultural, Professor of the Department of Economics and Economic Theory, West Ukrainian National University, Ternopil, Ukraine; ORCID: [0000-0001-6019-9654](https://orcid.org/0000-0001-6019-9654)

Received: 13/02/2025

Accepted: 25/05/2025

Published: 30/06/2025

© Copyright

2025 by the author(s)



This is an Open Access article distributed under the terms of the [Creative Commons CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/)

PRIVACY PREFERENCES AND TRUST IN CENTRAL BANKS: HETEROGENEITY IN CASE OF CBDC

ABSTRACT

Broad societal uptake of Central Bank Digital Currency (CBDC) is contingent on both its design features and public confidence in the issuing central bank. Based on survey results evaluated using Likert scales, this paper puts forth quantitative metrics assessing general privacy concerns alongside those specific to digital and financial interactions. Although baseline consistency in privacy preferences is observed, it dissipates when choice complexity increases. Significantly, we find no systematic relationship between individuals' quantified privacy preference levels and their choices regarding CBDC anonymity vs. functionality, their trust in the central bank's ability to protect CBDC privacy, or their belief in central bank independence as essential for that protection. Cluster analysis identifies respondent groups displaying preference consistency, the privacy paradox, or intermediate behaviours. These findings highlight substantial preference heterogeneity under complex choices, a critical factor for effective CBDC design. Consequently, central banks should engage more deeply in understanding user preferences and promoting CBDC functionality, ensuring privacy is not overlooked.

Keywords: CBDC, central bank, central bank independence, trust, digital money, privacy, anonymity, privacy paradox

JEL Classification: E41, E42, E51, E58, G20

INTRODUCTION

The further the central banks move away from the original idea of introducing CBDC, the more obvious that this technology is radical in its nature. The main advantage of the central bank digital currency was seen in the possibilities of preventing unwanted competition with cryptocurrencies and stablecoins, preserving monetary sovereignty, adapting to structural changes in money circulation with a declining share of cash payments, etc. (Brunnermeier et al. (2019), Brooks (2021)). Also, central banks had to respond to the transformation of the payment landscape and new consumer demand for the quality of payment services, in particular regarding speed, safety and reliability (Kantar Public (2022)).

The initial studies of central bank digital currency were focused on issues of influencing the financial sector, changing the role of the central bank in the digital environment, and analysing the behaviour of financial institutions and their customers depending on certain features of the CBDC design (Mancini-Griffoli (2018), Brunnermeier and Niepelt (2019), Andolfatto (2020), Agur (2022), Williamson (2022)). A supply-side view of CBDC appears to be prevailing. However, the case of CBDC is more complicated, as it involves the interaction of economic agents with an institution that will act as a monetary authority, a regulator for financial monitoring and a payment market, a supporter of the technological platform for interbank payments, etc. In light of this, the problem of CBDC functioning, optimal design and public demand is not one-dimensional.

It is quite natural that decisions concerning CBDC design should consider a set of supply-side constraints and a set of demand-side requirements. This fact puts central banks in an institutionally vulnerable position, in which they should be social and political marketers. The relationship between their independence and the issuance of digital currency is not institutionally sound (UK Parliament (2023)). On the other hand, the issue of

central bank independence is directly related to the success of the CBDC. The extensive monetization of private transaction data and the transformation of data into a source of market power raises the question of whether privacy is a public good (Garratt and van Oordt (2021)). The issuance of digital money and the selection of the optimal design should be delegated to independent central banks, as it is a natural precondition for this (Ballaschk and Paulick (2021)). However, central banks with a medium level of independence have made the most progress towards implementing CBDC (Koziuk (2021)). However, whatever the technological basis of the CBDC design, the issue of the ability of an independent central bank to guarantee privacy should be institutionally addressed (Tsang et al. (2023)).

At the same time, the perspectives of CBDC from the demand side are less investigated compared to the supply side as it was mentioned. Some rare cases of surveys, focused on consumer preferences, demonstrate strong ambiguity of CBDC perspectives and some strong privacy-demanded patterns of consumer preferences (Abramova et al. (2022), Bijlsma et al. (2021)). Choi et al. (2023) show that respondents are strongly adherent to payment instruments that guarantee the privacy of transactions especially in sensitive cases. At the same time, well-established literature on the so-called privacy paradox is a strong precondition to questioning reported CBDC privacy preferences shown in Abramova et al. (2022), Bijlsma et al. (2021), and Choi et al. (2023). While the privacy paradox is well-documented phenomena (Acquisti (2004), Acquisti and Grossklags (2005), Norberg et al. (2007), Barnes (2006), Athey et al. (2017), Chen et al. (2021)), it's also challenged from different theoretical perspectives (Kokolakis (2017), Solove (2021)).

Privacy preferences are positioned at the core of, for example, ECB's CBDC design choice (ECB (2019, 2022)). It is not so clear whether it will be the most motivating demand for central bank digital money. Trust in central banks as trust in institutional solutions to maintain relevant CBDC design may also play a strong role. At the same time, economic agents may deviate in their stated and revealed preferences challenging strong stress on privacy as a core CBDC design feature. While CBDC design is a complicated technological and institutional solution, economic agents may be under strong behavioural and informational asymmetry pressure. It is not known in advance how homogeneous economic agents are in terms of stated and revealed privacy preferences, preferences of anonymity of CBDC transactions over functionality of CBDC design and trust in the central bank.

This article shows that trust in the central bank can be an independent fact that does not follow directly from privacy preferences. Opting for CBDC anonymity or functionality may also not be tied to privacy preferences. From this, conclusions are made about more complex patterns of preferences toward privacy, the preference for CBDC anonymity over functionality, trust in central banks and their independence as a precondition of privacy guarantee. This is confirmed by a number of empirical tests. Cluster analysis was applied to show strong heterogeneity of respondents' preferences in a complicated choice structure environment. The resulting policy recommendation is that central banks should focus more on CBDC functionality while strengthening institutional mechanisms to protect their independence in the new digital world.

LITERATURE REVIEW

CBDC design issues are closely related to such directions of academic thoughts as modern theories of money, the economics of privacy, trust and credibility of independent central banks.

The understanding of "money as memory" (Kocherlakota, 1998) opened the way to rethinking the technological basis of how money performs its functions. Technological factors are seen as key to the fragmentation of the structural integrity of money functions (Brunnermeier et al., 2019). Thanks to this, payment services can compete with each other, offering a better customer experience within the limits of a separate function and thus generating a more complex and non-unified measurement of money. Money can embody privacy by design, or vice versa, depending on the technological foundation that is embedded in payment processes (Kahn et al., 2005; Garratt and van Oordt, 2021). So, technology advancements put under pressure traditional competition among money forms. CBDC potentially can be the central bank's response to increasing competition from the private payment services side (Brunnermeier et al., 2019). Such competition may reach the scale of challenges to monetary sovereignty. Panetta (2023) and Hernandez de Cos (2023) emphasize that the monetary sovereignty of the Eurozone should be ensured while respecting the privacy requirements of transactions with the digital euro.

Economics of privacy is another area where central bank digital money is in touch with contradictive issues related to economic agent's preferences toward privacy/anonymity of transactions. Cultural factors influence privacy choices (Li et al., 2017; Trepte et al., 2017; Omrani and Soulie, 2017). Money habitats are different across countries that may even affect the design of monetary institutions (Guiso et al., 2006; de Jong, 2002; Jost, 2018; Henchoz et al., 2019; Falicov, 2001). Some societies are more collectivist, others are more individualistic. Behavioural factors also influence privacy preference. Such a preference can be determined by age-related cautions, fear of innovations, etc. Similarly, the need for

privacy may be generated by institutional distortions when the credibility of public institutions is low. These issues are discussed by Koziuk and Ivashuk (2021).

Privacy preferences in the context of the economics of privacy are one of the most important factors that affect scrutiny about optimal CBDC design and demand for it. ECB is quite clear here about the high level of privacy with no anonymity of transactions as a socially optimal way to design CBDC (ECB (2019, 2021)). At the same time, Kantar Public's (2022) survey demonstrates that respondents are not positioning privacy as a priority of the expectations from payment instruments pushing forward functionality. From one point of view, this is the problem of how to combine supply-side limitations and demand-side expectations in the correct CBDC design. Many papers demonstrate that institutional and technological solutions of how to combine privacy guaranty, DLT and legal ALM/KYC claims are quite nontrivial (Fanti (2022), WEF (2021), ECB (2019), Bank of England (2020), Garratt and van Oordt (2021), Tsang et al. (2023)). From another point of view, these issues are in line with traditional research on privacy preferences in a digital environment.

Privacy paradox (Acquisti, 2004; Acquisti and Grossklags, 2005; Norberg et al., 2007; Barnes, 2006), objection of it (Solove, 2021) and rationalization of it (Kokolakis, 2017), Barth et al., 2017; Gerber et al., 2018) constitutes a corpus of discussions of what is the relevant modality of economic agent's behaviour in digital environment. Privacy paradox is a well-established phenomena that are mostly grounded on empirical research that confirm the general idea in many different settings (Athey et al., 2017; Chen et al., 2021). However, some rationalization of privacy paradox demonstrates more nuanced behaviour known as a privacy calculus (Culnan and Armstrong (1999)). According to the privacy calculus approach, economic agents demonstrate a different level of readiness to share information in terms of context, whom to share and what to share (Culnan and Armstrong, 1999; Barth et al., 2017; Hirschprung, 2023).

Privacy calculus as a special case of privacy paradox is well documented empirically. For example, in a survey of technologically savvy respondents Barth et al (2019) outlined that financial apps generate more interest in functionality than privacy instead of initial statements about privacy preferences. Brits and Jonker (2023) reach similar results demonstrating that a context of cost-benefit analysis of information sharing is important. The importance of context and whom information is shared with are confirmed in Van der Crujisen (2020) and Rosati et al (2022). Cloos et al. (2019) pay attention to some behavioural distortions in the case of stated and revealed privacy preferences. Barth et al (2019), Van der Crujisen (2020) and Brits and Jonker's (2023) results, being differ in nuances and some conclusions, are close to the problem that privacy preferences attributed to CBDC design could be over-expected by policy-makers. These empirical tests are not in line with direct surveys provided by Abramova et al. (2022), Bijlsma et al. (2021), Choi et al. (2023) that stressed strong preferences toward the privacy of CBDC.

Important to say, in Abramova et al. (2022), Bijlsma et al. (2021), Choi et al. (2023), Hrytsenko et al. (2024) questions about trust in central banks are also arisen. There are some relations between preferences toward privacy and trust in the central bank. However, there is no relation to the analysis of the source of trust in monetary institutions that could be very important in cases where institutional and technological dimensions it are interrelated.

Historical analysis of trust in central banks as payment technology innovators show that functional efficiency is a key driver of it, especially in situations with information asymmetry (Borio (2019), Schnabel and Shin (2004)). This suggests that trust in a central bank as a CBDC issuer should rest on a more complex set of drivers. Central banks are public institutions, policymakers and regulators. Trust in them should be generated taking into account their institutional and functional hypostases. Thus, it is not a case where the level of trust is tied to expectations of privacy guarantees by analogies with an e-commerce analysis (Wu et al., 2012).

Debates about the nature and source of trust continue to this day. It is presented both as a product of implicit coordination (Zanini and Migueles, 2013) and as a product of the interaction of institutions and formal organizations (Zucker, 1986).

However, it is evident that trust in people, trust in institutions and trust in technology is different. Trust in something based on technology is different from trust in money which is characterized by physical self-verification. Trust based on physical self-verification is replaced by trust in technology, which is not the same as trust in people (Lankton et al., 2015). At the same time, economic agents maintain depersonalized relationships with public institutions/regulators and therefore trust in them as institutions may be more important than trust in technology. This phenomenon is known from the analysis of trust in e-commerce (Pavlou and Gefen, 2004). Also, trust in institutions is not generated by analogy with the formation of trust in networks (Zarifis and Hu, 2024), in which a "third party" plays a significant role that can be appealed to in case of opportunistic behaviour of other network participants (Pavlou, 2002; Pavlou and Gefen, 2004). These issues directly cover the area of CBDC. Zarifis and Hu (2024) illustrate that demand for CBDC will rely on technology-driven trust, which is not the same as trust in people, as shown in Lankton et al. (2015). In the case of CBDC, a complex set of trust patterns

can be seen: trust as a functional efficiency; trust in the institutional set-up of the central bank; trust in the technology the CBDC are based on etc. It is necessary to go into detail here.

1. Trust based on functional efficiency. Historically, this aspect of trust is more common when analysing the ability of central banks to gain credibility. Historically known transformations of money circulation confirm the importance of the functional efficiency of central banks (Borio, 2019; Schnabel and Shin, 2004; Bordo, 2021). Bordo and Roberds (2022) emphasize that confidence in a successful monetary transformation is based on microeconomic efficiency and macroeconomic credibility. They also state that the ability to ensure privacy is a component of the CBDC project's success.
2. Trust arises from the institutional disposition of central banks, organizational systems and legislation, which create an environment for the functioning of new technologies. This line of argument is rooted in Zucker's (1986) analysis, which takes the approach that trust is generated at the level of the interaction of institutions, the effectiveness of formal organizations and the relevance of regulation. The functional effectiveness of regulatory organizations and their institutional position are also important.
3. Trust in the technology on which the implementation of CBDC is based. The ability to switch from incumbent payment technologies to a new one should be accompanied not only by an assessment of short-term losses and benefits but also by an understanding that the new technology is better in the indefinite dimension.
4. Trust in the institution of a central bank as an authority embodying a certain hierarchical position and acting as an arbiter. Certain behavioural fixations and displacements may be hidden in this aspect. However, research shows that the central bank enjoys a higher level of trust than BigTech companies or banks (Armantier et al., 2021). The same was noted by Choi et al. (2023) and Abramova et al. (2022) when studying the demand for CBDC. According to Bordo and Siklos (2015), functional efficiency and the ability to fulfil the mandate are key factors of trust in monetary institutions. At the same time, in the case of trust in digital money, the fact of "inflationary trauma" matters. Trust in a central bank is lower and confidence in cryptocurrencies is higher, where historical inflation is higher and central bank independence is questioned (Koziuk, 2021). In extrapolation to the CBDC issue, this means that a preference for privacy/anonymity may correlate with a higher level of trust in a central bank for reasons of "authority-seeking" heuristics or trust in an institution, or may exist separately from trust in a central bank. In conditions of institutional distortions, the need for privacy may diverge from trust in CBDC, and in such a case, other criteria by which economic agents evaluate the benefits of digital money may come to the fore, such as functionality (Koziuk and Ivashuk, 2022). In turn, Png and Tan (2020) based on the analysis of data from 36 countries claim that increased privacy concerns enhance the propensity to pay in cash, and strengthened trust in banks reduces the volume of cash payments.

The barrier of information asymmetry regarding the technological aspects on which the CBDC platform will be based, the lack of understanding of the institutional principles of the regulator's works in the digital environment, or the cognitive limitations of perceiving complex and versatile information related to the functioning of the CBDC will allow various kinds of distortions in the behaviour of economic agents. That is why a survey that focuses on CBDC preference detection should take into account the problem of choice in a complex environment and the possible heterogeneity of combinations of preferences attributed to areas related to central bank digital money.

Taking into account the problem of privacy paradox, privacy calculus and contextually determined attitude to privacy, it is possible to assume several alternative scenarios for the respondent's choice. **A)** Respondents who show a preference for privacy will tend to show a priority of anonymity over functionality and express trust in the central bank as well as its independence as a guarantee of privacy. That is, the privacy paradox is denied, and institutional trust is correlated with the need for anonymity. **B)** Respondents who show a preference for privacy do not clearly prefer anonymity over functionality and do not trust a central bank. That is, the privacy paradox is confirmed and at the same time privacy is perceived as institutionally vulnerable to the actions of regulators. **C)** Respondents demonstrate a multiplicity of choices and complexly organized patterns of preferences. That is, privacy preferences and the preference for anonymity over functionality can be perceived as separate classes of phenomena. Trust in a central bank as a guarantor of privacy can take place regardless of the extent to which respondents value privacy itself.

So, the main hypothesis of the paper is that in the case of complex choices, such as a privacy preference, CBDC design and trust in central banks, respondents are more likely to demonstrate heterogeneity that goes beyond the replication of a simple model of "privacy paradox – no privacy paradox".

Based on a survey of 156 respondents from 4 countries the hypothesis is generally confirmed. Cluster analysis was applied to verify heterogeneity and it demonstrates the complexity of preferences patterns among respondents. Results allow us to clarify certain provisions which relate to the analysis of demand for CBDC. Some policy recommendations could be

extracted from the results. Demand for CBDC will likely depend on both the functionality and institutional protection of central banks from interference in the ability to protect the privacy of CBDC transactions.

AIMS AND OBJECTIVES

The main aim of this paper is to investigate the heterogeneity of individual privacy preferences and trust in central banks in the context of potential Central Bank Digital Currency (CBDC) adoption, challenging the assumption of uniform user responses.

To achieve this aim, the following objectives were set:

1. To develop and apply quantitative metrics based on survey data and Likert scales for assessing individual privacy preferences across general, digital, and financial contexts.
2. To examine the consistency of these quantified privacy preferences across the different contexts.
3. To analyze the relationship between the level of individual privacy preference and specific choices regarding CBDC design features (anonymity vs. functionality) and trust in the central bank (as a guarantor of privacy and regarding its independence).
4. To identify and characterize distinct segments (clusters) of respondents based on the complex patterns of their privacy preferences, CBDC choices, and trust attitudes using cluster analysis.
5. To discuss the implications of the observed preference heterogeneity for the optimal design of CBDC and the role central banks may need to adopt in understanding and shaping user demand.

METHODS

Based on the initial assumptions about the need to take into account the idea of the transitivity of preferences, the privacy paradox, the privacy calculus and the importance of context, the starting point of the research is the survey design. The idea of a direct question about the preference for privacy/anonymity was rejected. The idea of testing the relationship between responses regarding privacy preferences and trust in central banks, as in Choi et al. (2023), Bijlsma et al. (2021), and Abramova et al. (2022), was also rejected. Instead, a scenario was chosen in which the propensity for privacy is evaluated, followed by the calculation of the corresponding index. For that, the Likert scale was applied. A similar approach to identifying respondents' preferences was implemented by Cloos et al. (2019). In their study, the influence of behavioural distortions in the transitivity of preferences was revealed, which can increase the effect of the heterogeneity of respondents' preferences.

The number of respondents is 156 from 4 countries (Ukraine, Uzbekistan, Nigeria, Zimbabwe). All countries are known for the not well-established quality of institutions, thus the institutional factors of privacy/anonymity attitudes, as well as trust in institutions, may vary from the case of developed countries. The number of respondents is looked enough keeping in mind that the survey contains an element of experiment. The age of respondents varies from 20 to 53 with some skewness toward youth. Google Form was chosen as a way to disseminate the questionnaire by e-mail.

So, the empirical methodology consists of the next stages:

- *First.* The questionnaire was constructed to verify the preferences toward privacy in general, in the digital environment, and in the financial environment. Such an approach helps to avoid the problem of challenging the open answers to direct questions about privacy preference from a privacy paradox viewpoint. For each set-up, the 10 questions were (see questionnaire in Koziuk et al., 2024). The answers were collected and the 3 indexes of propensity to privacy were calculated according to the Likert scale. So, for each respondent the 3 quantitative measures of privacy preferences were obtained – the Index of preference for general privacy (IGP), the Index of preference of privacy in a digital environment (IPDE), and the Index of preference of privacy in the financial environment (IPFE). The specific questions used to construct these indices are detailed in Koziuk et al. (2024).
- *Second.* The descriptive statistics and correlation test were applied to check how the 3 quantitative measures of privacy between each other.

- Third.** Respondents also answer the questions whether they: a) prefer the anonymity of CBDC transactions over functionality of CBDC design; b) trust or not trust in central bank as guarantor of CBDC transactions privacy; c) trust or not trust in central bank independence as a precondition to guaranty the CBDC transactions privacy. Grouping of respondents depending on the answer to the mentioned 3 questions (6 groups = 3 questions * 2 polar answers) was chosen as a precondition to check how differ 2 polar groups in terms of variation of 3 quantitative measures of individual privacy preference. More formal cluster analysis was applied to test the heterogeneity of respondent's preferences. Cluster analysis was chosen due to the complex choice problem and expected complicated organisation of patterns that contain 3 quantitative measures of privacy preferences and answers to 3 questions related to CBDC design features and trust in the central bank.

Clustering with a predetermined number of clusters and clustering with an automatic selection of the number of clusters based on the criterion of the highest statistical significance of the difference between them were successively tested. Accordingly, a clustering with the selection of 6 clusters was chosen, which confirmed the assumption of complex forms of relationships between the propensity for privacy and the choice in favour of one or another element of the CBDC design as well as the choice between trust and no trust in the central bank.

The results of this methodological approach confirmed that respondents demonstrate complexly organized patterns of preferences in situations where they encounter separate classes of phenomena. That is, they can demonstrate a sequence of privacy preferences and preferences that can be qualified as a privacy paradox at the same time. This requires the continuation of theoretical and empirical studies of this phenomenon and the denial of the rigid opposition of the preference transitivity to the privacy paradox when it comes to the complex structure of choice.

RESULTS

Obtained 3 quantitative measures of propensity to privacy (general privacy (IGP), Index of preference of privacy in digital environment (IPDE), and Index of preference of privacy in financial environment (IPFE)) demonstrate some differences in distribution.

Indicators of descriptive statistics	Index of general preference of privacy (IGP)	Index of preference of privacy in digital environment (IPDE)	Index of preference of privacy in the financial environment (IPFE)
Mean	32.0	33.1	27.5
Median	32.0	34.0	28.0
Mode	31.0	35.0	28.0
Frequency of mode	20	17	21
Min	15	18	17
Max	46	44	38
Standard Deviation	5.31	4.71	4.01
Coefficient of Variation	16.6	14.2	14.6
Skewness	-0.49	-0.55	-0.19
Kurtosis	0.79	0.79	-0.18

As seen from Table 1, IGP is the most variable among the three measures. It demonstrates heist standard deviation and coefficient of variation at levels of 5.31 and respectively 16.6, compared to 4.71 and 14.2 in the case of IPDE and 4.01 and 14.6 in the case of IPFE. Also, IGP has the highest max value of 46 and the lowest min value of 15. However, IGP demonstrates the middle level of mean, median and mode, while IPFE – is the lowest level and IPDE – is the highest. Generally, it is slightly opposite to intuition, because respondents stated the lowest level of privacy preferences in the financial environment. At the same time, IPFE is less skewed compared to IGP and IPDE, but the bell-shaped distribution function seems to be the most flattened. It is difficult to say how clear the privacy paradox is here. In a nutshell, if the data shows some signs of it, it exists only in the mild form.

The correlation test demonstrates that there are statistically significant relations between all 3 indexes. Pearson correlation is equal to 0.446 ($p = 0.000$) in the pair of IGP and IPDE, and 0.427 ($p = 0.000$) in the pair of IGP and IPFE. However, the correlation is slightly weaker in the pair of IPDE and IPFE being at 0.35 ($p = 0,000$). Spearman correlation test provides

quite similar results. The correlation between IGP and IPDE is 0.943 ($p = 0.05$), the same is true for pair of IGP and IPFE. In the case of IPDE and IPFE Spearman correlation is also weaker being at 0.886 ($p = 0.05$). The general conclusion from these tests is that the sequence of preferences in different set-ups is evident and there is no sign of a privacy paradox in strong form.

The next step is to compare levels of 3 quantitative measures of individual privacy preference (IGP, IPDE and IPFE) across groups divided by the respondent's response on answers: preference of anonymity of CBDC over functionality of CBDC design; trust in the central bank's possibility to guaranty privacy of CBDC transactions; trust in independence of central bank as a precondition to guaranty privacy of CBDC transactions. According to the idea of sequences of preferences, confirmed in the above correlation test, the level of IGP, IPDE and IPFE should differ between groups with polar answers. This sequence should be expected even in the case of trust in central banks, as Bijlsma et al. (2021) and Abramova et al. (2022) reported a correlation between higher privacy preference and trust in central banks. If the opposite, first of all in the case of the question about anonymity over the functionality of CBDC, the privacy paradox should likely take place.

Descriptive statistics for IGP, IPDE and IPFE were constructed for each of 6 groups, which are compared in pairs and among themselves. A graphical representation of the obtained results is presented in Appendix A.

As can be seen from the graphs in Appendix A, there are certain differences in the nature of the distribution of IGP, IPDE and IPFE indexes across groups. As in the case of descriptive statistics for the full sample, the IGP generally varies more than the IPFE. Instead, the IPDE shows an intermediate level of data dispersion. This pattern can be observed in most of the 6 groups. At the same time, there is no statistically significant difference in the nature of the distribution of the levels of the IGP, IPDE and IPFE indices in each of the three pairs. In other words, respondents with approximately similar individual propensities for privacy can choose both anonymity and functionality, express trust and no trust in the central bank, trust in its independence and not trust in it. The obtained results confirm the thesis that respondents show more complex patterns of preferences when it comes to combining separate classes of phenomena. The use of cluster analysis confirms this.

Cluster analysis was used to test more complex forms of interaction between individual propensities for privacy with respondents' choices regarding CBDC design elements and credibility to the central bank. The chosen technique is k-means. Since this method is sensitive to the dimensionality of the data, the values of the variables were standardized. In order to determine the most optimal number of clusters, several options were tested: with a predetermined number of clusters and with the number of clusters generated automatically. The best statistical properties were demonstrated by the last option that provides for the formation of 6 clusters, in which three indices of individual propensity for privacy and options for answering three questions regarding the design of the CBDC and credibility to the central bank are grouped (Table 2).

Table 2. Analysis of intergroup and intragroup variances when dividing respondents into 6 clusters. Note: * - Standardized data. (Source: obtained based on the application of the STATISTICA software package)

	Intergroup variance	Degrees of freedom	Intragroup variance	Degrees of freedom	F	p
IGP	58.51	5	96.49	150	18.19	<0.0001
IPDE	56.95	5	98.05	150	17.43	<0.0001
IPFE	85.46	5	69.54	150	36.87	<0.0001
Choice between anonymity and functionality* (A > F)	115.50	5	39.50	150	87.71	<0.0001
Choice trust in the central bank as a guarantor of privacy vs no trust*	143.57	5	11.43	150	376.96	<0.0001
The choice between agreeing that independence is a guarantee of the central bank's ability to provide privacy vs disagreeing*	70.90	5	84.10	150	25.29	<0.0001

From Table 2 it can be seen that the differences between the clusters are statistically significant for all six variables. Table 3 shows the average values of variable groups of respondents belonging to each of 6 clusters.

Table 3. Average values of variables for groups of respondents belonging to individual clusters. Note: * - Standardized data. (Source: obtained based on the application of the STATISTICA software package)

Variables	Clusters					
	1	2	3	4	5	6
IGP	30.5	33.5	35.0	19.5	31.3	32.4
IPDE	29.1	35.3	34.9	25.6	32.1	34.8
IPFE	26.0	29.3	31.3	19.4	24.0	28.1
Choice between anonymity and functionality* (A > F)	0.99	0.99	0.00	0.49	0.00	0.48
Choice trust in the central bank as a guarantor of privacy vs no trust*	0.96	0.99	0.99	0.99	0.96	0.00
The choice between agreeing that independence is a guarantee of the central bank's ability to provide privacy vs disagreeing*	0.92	0.80	0.79	0.13	0.87	0.10

In order to assess the consistency and transitivity of group preferences, a correlation analysis of cluster ranks based on the average values of the variables was applied (Table 4).

Table 4. Ranking of respondents' clusters according to average values of variables. Note: * - Standardized data. (Source: obtained based on the application of the STATISTICA software package)

Clusters (groups)	Variables					
	IGP	IPDE	IPFE	Choice between anonymity and functionality* (A > F)	Choice trust in the central bank as a guarantor of privacy vs no trust*	The choice between agreeing that independence is a guarantee of the central bank's ability to provide privacy vs disagreeing*
1	5	5	4	1.5	4	1
2	2	1	2	1.5	2	3
3	1	2	1	5.5	2	4
4	6	6	6	3	2	5
5	4	4	5	5.5	5	2
6	3	3	3	4	6	6

Based on the data in Tables 2-4 it is possible to describe the characteristics of the respondents in each cluster:

- Cluster 1 - respondents with a low level of individual propensity for privacy (IGP, IPDE and IPFE values are below the average level), but with a prevailing choice of A > F and high trust in the central bank's ability to guarantee privacy and trust in its independence.
- Cluster 2 – respondents with a high level of individual propensity for privacy (IGP, IPDE and IPFE values are above the average level), with a prevailing choice of A > F and strong trust in the central bank's ability to guarantee privacy and trust in its independence.
- Cluster 3 - respondents with a high level of individual propensity for privacy (IGP, IPDE and IPFE values are the highest), but with a strong choice of A > F and strong trust in the central bank's ability to guarantee privacy and trust in its independence.
- Cluster 4 - respondents with a low level of individual propensity for privacy (IGP, IPDE and IPFE values are the lowest), with a prevailing choice of F > A as well as strong trust in the central bank's ability to guarantee privacy and trust in its independence.
- Cluster 5 - respondents with a high level of individual propensity for privacy (IGP and IPDE values are higher than the average level, and IPFE is lower than the average level), but with a strong choice of A > F and strong trust in the central bank's ability to guarantee privacy and trust in its independence.
- Cluster 6 - respondents with a high level of individual propensity for privacy (IGP, IPDE and IPFE values are above the average level), but with a prevailing choice of A > F and lack of trust in the central bank's ability to guarantee privacy and no trust in its independence.

The obtained results of the classification of respondents' choices once again emphasize that the analysis of behaviour in the digital environment cannot be based on a simple binary scheme. Respondents show more complex patterns of preferences when it comes to combining separate classes of phenomena. This means that it is hardly possible to talk about a unified design of CBDC across countries. To propose an optimal design of a CBDC within a country requires an unusual function of central banks to study consumer preferences and demand parameters to get a positive scale effect and maximize public welfare.

DISCUSSION

Empirical studies of demand on CBDC demonstrate at least two important moments. First, privacy as a feature of CBDC is strongly demanded. Second, between privacy preferences and trust in central banks some kind of correlation exists (Abramova et al., 2022; Bijlsma et al., 2021; Choi et al., 2023). The obtained results in this paper put this under question. From a theoretical viewpoint, the direct questions about preferences of privacy provided by CBDC design could be criticised from the privacy paradox approach. Relation between trust in the central bank and privacy preferences requires theoretical foundations. As is known, trust is formed on the basis of functional efficiency (Zucker, 1986; Borio, 2019; Schnabel and Shin, 2004; Bordo, 2021; Bordo and Roberds, 2022), which is not yet known in the case of CBDC. It can fall under the problem of the positive experience extrapolation or inclination toward authorities that could not be a case of the central bank's lack of credibility (Koziuk, 2021).

However, empirical results in this paper show that respondents may be heterogeneous in their preferences when it comes to complicated choice structures. Provided tests demonstrate that whatever the privacy paradox (Acquisti, 2004; Acquisti and Grossklags, 2005; Athey et al., 2017; Chen et al., 2021; Barth et al., 2019), respondents demonstrate more complex patterns of preferences. They are generally sequent in their preferences that are gravitated to similar contexts (positive correlation between IGP, IPDE and IPFE). And they lost the sequence in terms of a more complicated choice structure. There is no strong difference between the average values of all three calculated indices of individual propensity for privacy across groups divided by choices regarding CBDC anonymity and functionality, trust vs no trust in the central bank as a guarantor of CBDC privacy, trust vs no trust in its independence as a prerequisite for the ability to guarantee of privacy of CBDC transactions. The explanation is the next. A change in a class of phenomena in the respondents' perception, which affects the complexity of their choice mode, is valuable for the final choice.

The applied cluster analysis confirmed the presence of a complex organization of preference patterns, which indicates the heterogeneity of the sample and the incorrectness of the strict contrast between the transitivity of preferences and the privacy paradox. Such results are not in line with recent studies of CBDC demand (Abramova et al., 2022; Bijlsma et al., 2021; Choi et al., 2023) and require a deeper understanding of relations between the source of trust, privacy preferences and central banks' credibility in a digital environment. Also, it is hard to reject the idea of privacy paradox as in Solove (2021). It is likely that strong privacy preferences as a precondition for CBDC design are overstated as indirectly shown in Kantar Public (2022) vs the direct statement of ECB (2019, 2021).

Does this mean that central banks should not rely on the simplistic definition of privacy preferences? Yes. However, this raises the problem that central banks should be engaged in the unusual function of studying consumer preferences and demand parameters for digital currency.

CONCLUSIONS

Demand for CBDC is an important issue for central banks. At the same time, demand is expected to be strongly dependent on its design. Some initial papers demonstrate that respondents adhere to a high level of privacy in CBDC design and generally trust central banks. In this paper, it is shown that issues related to CBDC design and trust in the central bank are subject to the problem of economic agent's preferences heterogeneity.

Respondent's preferences toward privacy were quantified taking into account context and privacy paradox considerations. Thus, based on the results of the survey and the Likert scale application, the 3 quantitative measures (indexes) of privacy preferences were reported that demonstrate privacy attitudes in general, in the digital environment and in the financial environment. While such indexes are distributed a bit differently, there is a positive and statistically significant correlation between them. This means that a sequence of preferences is held and the privacy paradox is not likely to dominate. However, respondents demonstrate no strong difference in the level of 3 quantitative measures of privacy preferences in terms of grouping in accordance with the choice between:

- the anonymity of CBDC vs functionality of CBDC design;
- trust in the central bank's ability to guarantee the privacy of CBDC vs. trust;
- trust in central bank independence as a precondition to guarantee CBDC privacy vs no trust.

Cluster analysis demonstrates that respondents are heterogenous when it comes to combination of the privacy preferences, choice among CBDC design options and trust in central bank and central bank independence. Based on k-mean technic and data normalization the 6 clusters were obtained. Some clusters demonstrate a strong sequence of preferences, some clusters demonstrate the validity of the privacy paradox, and some clusters combine elements of both.

Based on empirical results it is possible to say that: consistency in privacy preferences can be traced within a similar class of phenomena; such consistency disappears then the structure of choice goes beyond the similar class of phenomena, for example, the relationship between individual propensity for privacy and the choice between CBDC anonymity or functionality becomes a barrier to the transitivity of preferences; the same is valid in case of trust in the central bank; respondents are heterogenous and demonstrates complexity of organized preferences and choice patterns.

The findings are important for CBDC policies. Firstly, the privacy of transactions may appear to be overestimated, which, however, does not reduce its importance. Secondly, the functionality of the CBDC will be critical for demand for it. Thirdly, constructing a socially optimal CBDC design will require the central bank to engage in the marketing-based study of consumer preferences, which is not usual for policymakers. Fourthly, the institutional status of central banks needs to be strengthened due to the challenges posed by the digitalization of money. Fifthly, a universal CBDC design that will be optimal for all countries is unlikely to be expected.

The obtained results pave the way for further in-depth exploration of preference heterogeneity regarding Central Bank Digital Currency (CBDC). Future research could focus on qualitative analysis of the identified clusters, utilizing methods such as in-depth interviews, to better understand the motivations and considerations of respondents within each group, as well as expanding the geographical scope by conducting similar surveys in countries with varying levels of institutional trust, digital literacy, and cultural characteristics to test the universality of the observed patterns. Another important direction involves the dynamic analysis of preference stability over time and how user preferences react to different information campaigns or CBDC design prototypes. Furthermore, a more detailed examination of the factors shaping trust (or distrust) in the central bank as a CBDC issuer and privacy guarantor, particularly the role of its independence, is necessary, alongside an analysis of how demographic and socioeconomic characteristics (age, education, income) influence respondents' membership in specific preference clusters. Finally, developing more complex choice models that account for the identified complexity and heterogeneity of preferences, moving beyond simplified dichotomies such as the 'privacy paradox/preference transitivity' when modelling CBDC demand, holds significant promise.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All Authors have contributed equally.

FUNDING

The Authors received no funding for this research.

CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES

1. Abramova, S., Böhme, R., Elsinger, H., Stix, H., & Summer, M. (2022). What can CBDC designers learn from asking potential users? Results from a survey of Austrian residents. *Oesterreichische Nationalbank Working Paper, 241*. <https://ideas.repec.org/p/onb/oenbwp/241.html>
2. Acquisti, A. (2004). Privacy in electronic commerce and the economics of immediate gratification. In: EC '04 Proceedings of the 5th ACM Conference on Electronic Commerce, USA, 21-29. <https://doi.org/10.1145/988772.988777>
3. Acquisti, A., & Grossklags, J. (2005). Privacy and rationality in individual decision making. *IEEE Security & Privacy, 2*, 24-30. <https://doi.org/10.1109/MSP.2005.22>

4. Agur, I., Ari, A., & Dell'Ariccia, G. (2022): Designing central bank digital currencies. *Journal of Monetary Economics*, 125, 62–79. <https://doi.org/10.5089/9781513519883.001>
5. Andolfatto, D. (2020). Assessing the Impact of Central Bank Digital Currency on Private Banks. *The Economic Journal*, 131, 525–540. <https://doi.org/10.20955/wp.2018.026>
6. Armantier, O., Doerr, S., Frost, J., Fuster, A., & Shue, K. (2021) Whom do consumers trust with their data? US survey evidence. BIS Bulletin, 42. <https://www.bis.org/publ/bisbull42.pdf>
7. Athey, S., Catalini, C., & Tucke, C. (2017). The Digital Privacy Paradox: Small Money, Small Costs, Small Talk. *NBER Working Paper*, 23488, 1-34. https://www.nber.org/system/files/working_papers/w23488/w23488.pdf
8. Ballaschk, D., & Paulick, J. (2021). The public, the private and the secret: Thoughts on privacy in central bank digital currencies. *Journal of Payments Strategy & Systems*, 15(3), 277-286. <https://ideas.repec.org/a/aza/jpss00/y2021v15i3p277-286.html>
9. Bank of England (2020). Central Bank Digital Currency: Opportunities, Challenges, and Designs, Bank of England Discussion Paper. <https://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper>
10. Barnes S.(2006). A privacy paradox: Social networking in the United States. *First Monday*, 11(9). <https://doi.org/10.5210/fm.v11i9.1394>
11. Barth, S., De Jong, M., Junger, M., Hartel, P., & Roppelt, J. (2019). Putting the privacy paradox to the test: Online privacy and security behaviors among users with technical knowledge, privacy awareness, and financial resources. *Telematic and Informatics*, 41, 55-69. <https://doi.org/10.1016/j.tele.2019.03.003>
12. Barth, S., Menno, D., & de Jong, T. (2017). The privacy paradox – Investigating discrepancies between expressed privacy concerns and actual online behavior – A systematic literature review. *Telematics and Informatics*, 34, 1038-1058. <https://doi.org/10.1016/i.tele.2017.04.013>
13. Bijlsma, M., van der Cruijisen, C., Jonker, N., & Reijerink, J. (2021). What triggers consumer adoption of CBDC? *De Nederlandsche Bank Working Paper*, 709, 1-33. <https://doi.org/10.2139/ssrn.3839477>
14. Bordo, M. (2021). Central Bank Digital Currency in Historical Perspective: Another Crossroad in Monetary History. *NBER Working Paper*, 29171, 1-28. <https://ideas.repec.org/p/nbr/nberwo/29171.html>
15. Bordo, M., & Robedrs, W. (2022). Central Bank Digital Currencies, an Old Tale With a New Chapter. *NBER Working Paper*, 30709, 1-38. <https://ideas.repec.org/p/nbr/nberwo/30709.html>
16. Bordo, M., & Siklos, P. (2015). Central Banks Credibility: Historical and Quantitative Exploration. *NBER Working Paper*, 20824, 1-95. <http://www.nber.org/papers/w20824>
17. Borio, C. (2019). On Money, Debt, Trust, and Central Banking. *BIS Working Paper*, 763, 1-31. <https://www.bis.org/publ/work763.htm>
18. Brits, H., & Jonker, N. (2023). The Use of Financial Apps: Privacy Paradox or Privacy Calculus? *De Nederlandsche Bank Working Paper*, 794, 1-46. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4624569
19. Brooks, S. (2021). Revisiting the Monetary Sovereignty Rationale for CBDCs. *Bank of Canada Staff Discussion Paper*, 2021-17, 1-29. <https://doi.org/10.34989/sdp-2021-17>
20. Brunnermeier, M., James, H., & Landau, J.P. (2019). The Digitalization of Money. *NBER Working Paper*, 26300, 1-32. <http://dx.doi.org/10.3386/w26300>
21. Brunnermeier, M., & Niepelt, D. (2019). On the Equivalence of Private and Public Money. *Journal of Monetary Economics*, 106, 27-41. <https://doi.org/10.1016/j.jmoneco.2019.07.004>
22. Chen, L., Huang, Y., Ouyang, S., & Xiong, W. (2021). The data privacy paradox and digital demand. *NBER Working Paper*, 28854. https://www.nber.org/system/files/working_papers/w28854/w28854.pdf
23. Cloos, J., Frank, B., Kampenhuber, L., Karam, S., Luong, N., Moller, D., Monge-Larrain, M., Tan Dat, N., Nilgen, M., & Rossler, Ch. (2019). Is Your Privacy for Sale? An Experiment on the Willingness to Reveal Sensitive Information. *Games*, 10(28), 2-15. <https://doi.org/10.3390/g10030028>
24. van der Cruijisen, C. (2020). Payments data: do consumers want banks to keep them in a safe or turn them into gold? *Applied Economics*, 52(6), 609 – 622. <https://doi.org/10.1080/00036846.2019.1659493>
25. Culnan, M., & Armstrong, P. (1999). Information privacy concerns, procedural fairness, and impersonal trust: An empirical investigation. *Organizational Science*, 10(1), 340-347. <https://doi.org/10.1287/orsc.10.1.104>
26. ECB. (2021b, April). Digital euro: Experimentation, scope and key learnings. Technical report, European Central Bank. <https://www.ecb.europa.eu/pub/pdf/other/ecb>
27. ECB. (2021a, April). Eurosystem report on the public consultation on a digital euro. Consultation report, European Central Bank. https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf
28. European Central Bank (2019). Exploring Anonymity in Central Bank Digital Currencies. ECB. *In Focus*, 4, 1-11. https://www.ecb.europa.eu/press/intro/publications/pdf/ecb_b.mipinfocus191217.da.pdf
29. European Central Bank (2021, April). Eurosystem report on the public consultation on a digital euro. https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf

30. Falicov, S. (2001). Ethnicity and the Meaning of Money and Property. *American Behavioral Scientist*, 45(2), 313-328. <http://dx.doi.org/10.1177/00027640121957088>
31. Fanti, G. (2022). An Apparent Trilemma for Cross Border Central Bank Digital Currencies. *Harvard National Security Journal*, 14(75), 75-86. https://harvardnsj.org/wp-content/uploads/2022/12/Fanti_14-Harv.-Natl.-Sec.-J.-75-2022.pdf
32. Garratt, R., & van Oordt, M. (2021). Privacy as a public good: a case for electronic cash. *Journal of Political Economy*, 129(7), 2157–2180. <https://doi.org/10.1086/714133>
33. Gerber, N., Gerber, P., & Volkamer, M. (2018). Explaining the privacy paradox: A systematic review of literature investigating privacy attitude and behavior. *Computers and Security*, 77, 226-261. <https://doi.org/10.1016/j.cose.2018.04.002>
34. Guiso, L., Sapienza, P., & Zingales, L. (2006). Does Culture Affect Economic Outcomes? *Journal of Economic Perspectives*, 20(2), 23-48. <http://dx.doi.org/10.1257/jep.20.2.23>
35. Henchoz, C., Coste, T., & Wernli, B. (2019). Culture, Money Attitudes, and Economic Outcomes. *Swiss Journal of Economics and Statistics*, 155(2), 1-13. <http://dx.doi.org/10.1186/s41937-019-0028-4>
36. Hernandez de Cos, P. (2023, November 20). The Digital Euro Project – A New Milestone. Speech by Mr Pablo Hernández de Cos, Governor of the Bank of Spain, at the Annual Convention of the Asociación de Mercados Financieros, Madrid. <https://www.bis.org/review/r231121i.pdf>
37. Hirschprung, R. (2023). Is the Privacy Paradox a Domain-Specific Phenomenon. *Computers*, 12(156), 1-14. <https://doi.org/10.3390/computers12080156>
38. Hrytsenko, L., Zakharkin, O., Zakharkina, L., Hedegaard, M., Kuznyetsova, A., & Novikova, L. (2024). Assessment of the level of information transparency of banks. *Financial and Credit Activity Problems of Theory and Practice*, 6(59), 60–75. <https://doi.org/10.55643/fcaptop.6.59.2024.4619>
39. de Jong, E. (2002). Why Are Price Stability and Statutory Independence of Central Banks Negatively Correlated? The Role of Culture. *European Journal of Political Economy*, 18, 675-694. [https://doi.org/10.1016/S0176-2680\(02\)00114-3](https://doi.org/10.1016/S0176-2680(02)00114-3)
40. Jost, A. (2018). Cultural Differences in Monetary Policy Preferences. *Swiss National Bank Working paper*, 2, 1-46. <https://ideas.repec.org/p/snb/snbwpa/2018-02.html>
41. Kahn, Ch., McAndrews, J., & Roberds, W. (2005). Money is Privacy. *International Economic Review*, 46(2), 377-399. <https://doi.org/10.1111/j.1468-2354.2005.00323.x>
42. Kantar Public. (2022). Study on new digital payment methods. Kantar Public - commissioned by the European Central Bank. https://www.ecb.europa.eu/euro/digital_euro/timeline/prof_use/shared/pdf/ecb.dedocs220330_annex_summary.en.pdf
43. Kocherlakota, N. (1998). Money is Memory. *Journal of Economic Theory*, 81(2), 232-251. <https://doi.org/10.1006/jeth.1997.2357>
44. Kokolakis, S. (2017). Privacy attitudes and privacy behaviour: A review of current research on the privacy paradox phenomenon. *Computer & Security*, 64, 122-134. <https://doi.org/10.1016/j.cose.2015.07.002>
45. Koziuk, V. (2021). Willingness to adopt digital currency: whether central bank independence is important. *Finance of Ukraine*, 3, 7-22. <https://doi.org/10.33763/finukr2021.03.007>
46. Koziuk, V. (2022). What do cross-country Bitcoin holdings tell us? *Monetary and institutional discontent vs financial development*, 19(1), 168-185. [http://dx.doi.org/10.21511/imfi.19\(1\).2022.13](http://dx.doi.org/10.21511/imfi.19(1).2022.13)
47. Koziuk, V., & Ivashuk, Y. (2022). Does it Matter for CBDC Design? Privacy-Anonymity Preferences from the Side of Hierarchies and Egalitarian Cultural Patterns. *Economics*, 10(1), 35-53. <https://doi.org/10.2478/eoik-2022-0008>
48. Koziuk, V., Ivashuk, Y., Hayda, Y., & Dluhopolskyi, O. (2024). CBDC and trust in A central bank: transitivity of preferences vs. the privacy paradox. *Financial Internet Quarterly*, 20(4), 32–47. <http://dx.doi.org/10.2478/fiqf-2024-0025>
49. Lankton, N., McKnight, H., & Tripp, J. (2015). Technology, Humanness, and Trust: Rethinking Trust in Technology. *Journal of the Association for Information Technology*, 16(10), 880–918. <https://doi.org/10.17705/1ajais.00411>
50. Li, Y., Kobsa, A., Knijnenburg, B., & Nguyen, C. (2017). Cross-Cultural Privacy Predictions. *Proceedings on Privacy Enhancing Technologies*, 3(2), 1-20. <https://doi.org/10.1515/popets-2017-0019>
51. Mancini-Griffoli, T., Martinez Peria, M. S., Agur, I., Ari, A., Kiff, J., Popescu, A., & Rochon, C. (2018). Casting Light on Central Bank Digital Currency. *IMF Staff Discussion Notes*, 18(08). <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2018/11/13/Casting-Light-on-Central-Bank-Digital-Currencies-46233>
52. Norberg, P., Horne, D., & Horne, D. (2007). The privacy paradox: Personal information disclosure intentions versus behaviors. *Journal of Consumer Affairs*, 41(1), 100-126. <https://doi.org/10.1111/j.1745-6606.2006.00070.x>
53. Omrani, N., & Soulié, N. (2017). Culture, Privacy Conception and Privacy Concern: Evidence from Europe before PRISM, 14th Asia-Pacific Regional Conference of the International Telecommunications Society (ITS): "Mapping ICT into Transformation for the Next Information Society", Kyoto, Japan, 24th-27th June, 2017, International Telecommunications Society (ITS), Calgary. <https://www.econstor.eu/handle/10419/168531>
54. Pavlou, P. A. (2002). Institution-Based Trust in Interorganizational Exchange Relationships: Te Role of Online B2B Marketplaces on Trust Formation. *The Journal of Strategic Information Systems*, 11(3–4), 215-243. [https://doi.org/10.1016/S0963-8687\(02\)00017-3](https://doi.org/10.1016/S0963-8687(02)00017-3)

55. Pavlou, P. A., & Gefen, D. (2004). Building Effective Online Marketplaces with Institution-Based Trust. *Information Systems Research*, 15(1), 667-675. <https://doi.org/10.1287/isre.1040.0015>
56. Png, I., & Tan, Ch. (2020). Privacy, Trust in Banks, and Use of Cash. Special Feature C in the April 2020 Macroeconomic Review. *Monetary Authority of Singapore*, 1-8. <https://doi.org/10.2139/ssrn.3526531>
57. Rosati, P., Fox, G., Cummins, M., & Lynn, T. (2022). Perceived Risk as a Determinant of Propensity to Adopt Account Information Services under the EU Payment Services Directive. *Journal of Theoretical and Applied Electronic Commerce Research*, 17, 493-506. <https://doi.org/10.3390/jtaer17020026>
58. Schnabel, I., & Shin, H. S. (2004). Liquidity and Contagion: The Crisis of 1763. *Journal of the European Economic Association*, 2 (6), 1-40. <https://doi.org/10.1162/1542476042813887>
59. Solove, D.J. (2021). The myth of the privacy paradox. *George Washington Law Review*, 89(1), 1-51. <http://dx.doi.org/10.2139/ssrn.3536265>
60. Trepte, S., Reinecke, L., Ellison, N., Quiring, O., Yao, M., & Ziegele, M. (2017). A Cross-Country Perspective on Privacy Calculus. *Social Media + Society*, 1-13. <http://dx.doi.org/10.1177/2056305116688035>
61. Tsang, Ch.-U., Yang, A., & Chen, P.-K. (2023). Disciplining CBDC: Addressing the Privacy Aspects and Central Bank Independence. *Northwestern Journal of International Law and Business*, 4(3), 235-289. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4253888
62. UK Parliament. (2023). Central Bank Digital Currency: Solution in Search of a Problem. House of Lord. Economic Affairs Committee. 3rd Report on Session 2021-2022. 52 p. <https://publications.parliament.uk/pa/ld5802/ldselect/ldeconaf/131/13102.htm>
63. Williamson, S. (2022). Central Bank Digital Currency: Welfare and Policy Implications. *Journal of Political Economy*, 130(11), 2829-2861. <https://doi.org/10.1086/720457>
64. World Economic Forum (2021, November). Privacy and Confidentiality of Central Bank Digital Currency. *White Paper*, 1-21. https://www3.weforum.org/docs/WEF_Privacy_and_Confidentiality_Options_for_CBDCs_2021.pdf
65. Wu, K.-W., Yen, D., Huang, Sh.Y., & Popova, I. (2012). The effect of online privacy policy on consumer privacy concern and trust. *Computers in Human Behavior*, 28(3), 889-897. <https://doi.org/10.1016/j.chb.2011.12.008>
66. Zanini, M., & Migueles, C. (2013). Trust as an Element of Informal Coordination and its Relationship with Organizational Performance. *Economia*, 14(2), 77-87. <https://doi.org/10.1016/j.econ.2013.08.005>
67. Zucker, L. (1986). Production of Trust: Institutional Sources of Economic Structure, 1840-1920. *Research in Organizational Behavior*, 8, 53-111. <https://psycnet.apa.org/record/1988-10420-001>

Козюк В., Івашук Ю., Гайда Ю.

НАЛАШТУВАННЯ КОНФІДЕНЦІЙНОСТІ ТА ДОВІРА ДО ЦЕНТРОБАНКІВ: НЕОДНОРІДНІСТЬ У ВИПАДКУ CBDC

Успішний попит на CBDC залежить від його дизайну, який буде широко прийнятий суспільством. Також потрібна відповідна довіра до центрального банку. У цій роботі на основі результатів опитування та шкали Лайкерта із застосуванням кількісних показників загальної переваги конфіденційності вводяться переваги конфіденційності в цифровому та фінансовому середовищі. Підтверджується узгодженість налаштувань конфіденційності в різних налаштуваннях. Але така послідовність зникає, тоді структура вибору ускладнюється. Немає відповідності між рівнем кількісних показників уподобань конфіденційності та вибором між анонімністю CBDC та функціональністю дизайну CBDC; довіра до здатності центрального банку гарантувати конфіденційність CBDC на противагу відсутності довіри; Довіра до незалежності центрального банку як передумова такої гарантії на противагу відсутності довіри. Кластерний аналіз показує, що респонденти організовані в групи, де може переважати узгодженість уподобань, парадокс конфіденційності та щось середнє між ними. Це емпіричний аргумент для підтвердження неоднорідності вподобань респондентів щодо складності структури вибору, що не є незначною для оптимального проектування CBDC. Центральні банки повинні глибше займатися незвичайною функцією вивчення переваг і просування функціональності CBDC, при цьому приватність не повинна ігноруватися.

Ключові слова: CBDC, центральний банк, незалежність центрального банку, довіра, цифрові гроші, приватність, анонімність, парадокс приватності

JEL Класифікація: E41, E42, E51, E58, G20

DISTRIBUTION OF PRIVACY PROPENSITY INDEX LEVELS IN GROUPS FORMED BY CHOOSING AMONG ALTERNATIVE RESPONSE OPTIONS TO QUESTIONS REGARDING PREFERENCE FOR ANONYMITY OVER FUNCTIONALITY AND TRUST IN THE CENTRAL BANK AS THE ISSUER OF CBDC



Figure 1. Distribution of privacy propensity indices in the group that prefers anonymity over functionality.



Figure 2. Distribution of privacy propensity indices in the group that prefers functionality over anonymity.

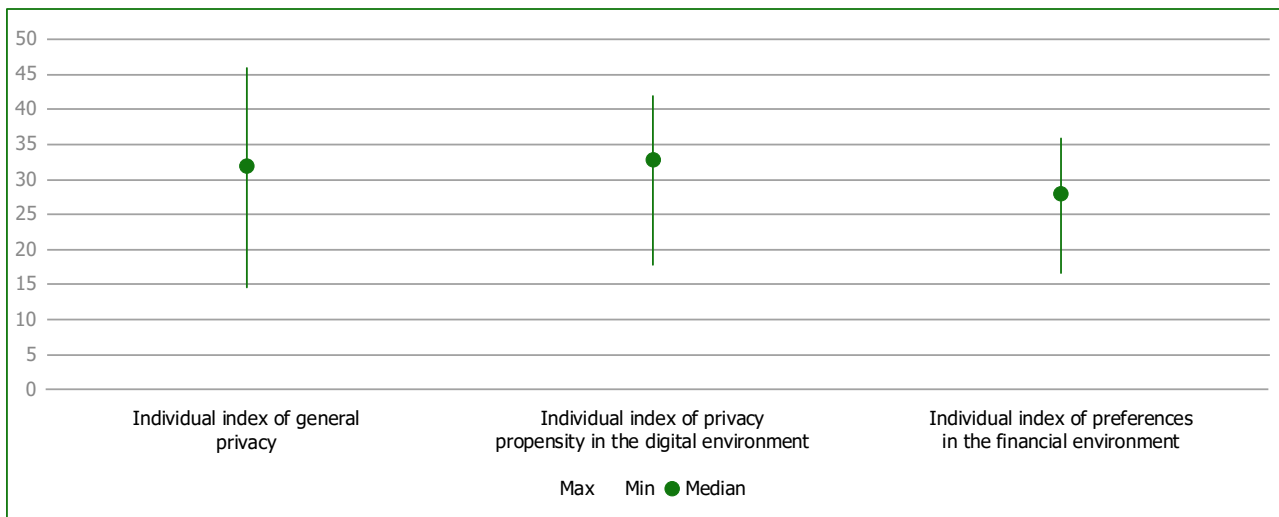


Figure 3. Distribution of individual privacy attitude indices in a group that trusts the central bank's ability to guarantee anonymity.

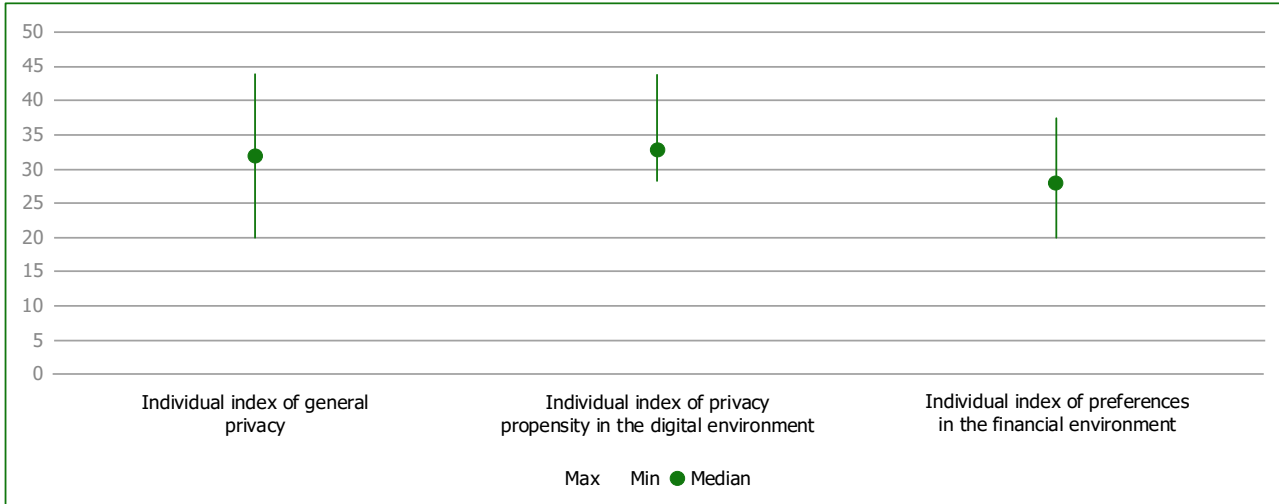


Figure 4. Distribution of indices of individual propensity for privacy in a group that distrusts the central bank's ability to guarantee anonymity.

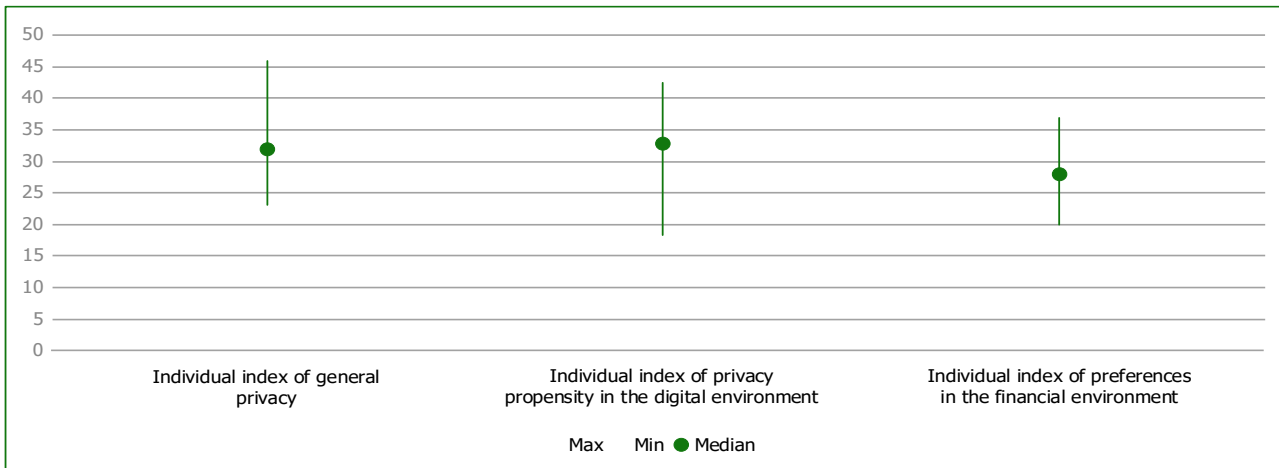


Figure 5. Distribution of individual privacy propensity indices in a group that trusts central bank independence as a guarantee of anonymity.

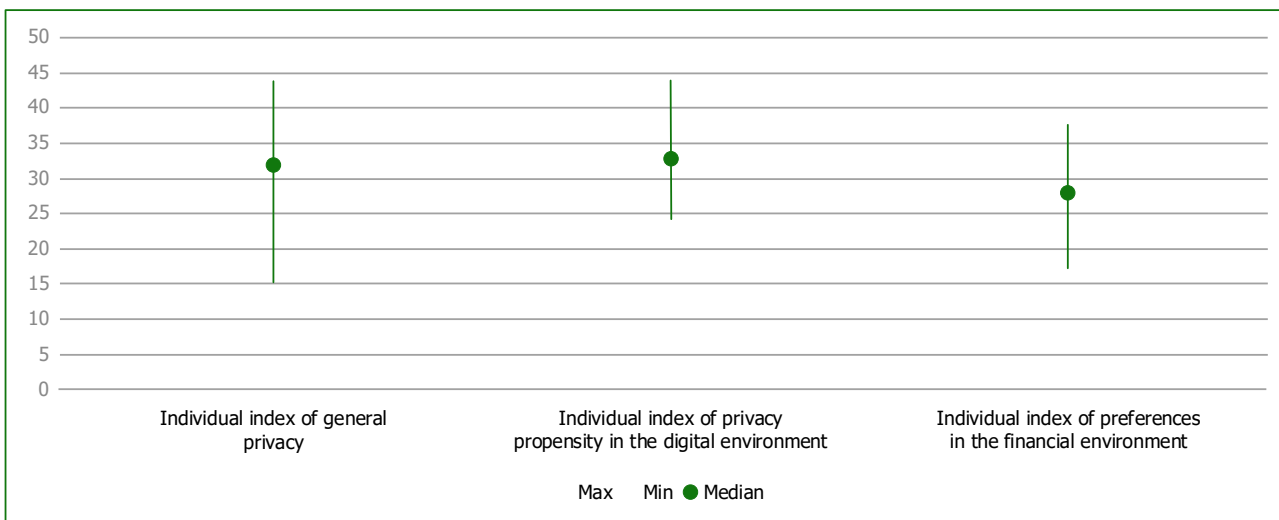


Figure 6. Distribution of individual privacy propensity indices in a group that does not trust that central bank independence is a guarantee of anonymity.