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* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.

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Abstract

Central banks around the world are examining the possibility of introducing Central Bank Digital Currency (CBDC). The public's preferences concerning the usage of CBDC for paying and saving are important determinants of the success of CBDC. Using data from a representative panel of Dutch consumers we find that roughly half of the public would open a CBDC current account. The same holds for a CDBC savings account. Thus, we find clear potential for CBDC in the Netherlands. This suggests that consumers perceive CBDC as distinct from current and savings accounts offered by traditional banks. Intended adoption is positively related to respondents' knowledge of CBDC and trust in banks and in the central bank. Price incentives matter as well. The amount respondents want to deposit in the CBDC savings account depends on the interest rate offered. Furthermore, intended usage of the CBDC current account is highest among people who find privacy and security important and among consumers with low trust in banks in general. These results suggest that central banks can steer consumers' adoption of CBDC via the interest rate, by a design of CBDC that takes into account the public's need for security and privacy, and by clear communication about what CBDC entails.

Keywords: CBDC, consumers, public money, private money, bank accounts, trust, interest rates
JEL classification: D12, D14, E58, G21

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1. Introduction

General purpose Central Bank Digital Currency (CBDC) has gone from a topic that attracted mainly academic interest to a mainstream policy issue. Its stellar rise is due to several reasons. First, the rise of stablecoins and cryptocurrencies has shown that it is technically feasible to create digital means of payments separate from traditional current accounts and existing payment systems. Second, the plans of big tech firms to enter the payment markets, most notably Facebook's Diem initiative, potentially put central banks' key role in the payment system under pressure. Third, changing consumer preferences are inexorably moving retail payments away from cash towards digital means of payment.

As a result, central banks around the world are now actively involved in research on whether to introduce a CBDC. In a recent BIS survey among 65 central banks, 60 percent indicated that they were conducting experiments or engaged in proof of concept exercises (Boar and Wehrli 2021). Important motivations, according to the central banks, are payment robustness, payment efficiency, and financial inclusion, as well as the right of citizens to have direct access to central bank money. In Europe, the ECB has initiated a high-level group and started experiments. Its stated goal is to be ready to introduce a digital euro when the need arises. In some countries, most notably China, central banks are already in the last stages of the pilot phase and CBDC is being trialed in several cities.

Payment methods operate in a two-sided market, with one side being represented by consumers and firms wanting to pay, and the other side by consumers and firms receiving payments. For a payment instrument to succeed, it is important to have both sides onboard, as the utility derived by some using a payment on the one side of the market depends on the number of those accepting the payment instrument on the other side of the market. In addition to merchants accepting CBDC as a means of payment, consumer demand for CBDC is therefore an important element that determines how widely CBDC would be used.

As the successful implementation of CBDC crucially depends on how many consumers are motivated to adopt this new digital form of public money, it is important to know which factors influence that adoption. This study therefore focusses on the user side of the market and specifically asks the question: "What drives consumers to use CBDC?" We look both at CBDC as a new form of payment and CBDC as an interest-bearing savings instrument. To the best of our knowledge, there is no empirical research available concerning the adoption of CBDC from a consumer perspective and the factors that influence this adoption. Our work aims to fill that gap by being the first empirical study on consumers' adoption and intended usage of CBDC. By providing a consumer perspective, our study is a relevant complement to the growing list of policy-oriented studies that discuss design issues such as the governance, cybersecurity and legal aspects of CBDC. See e.g. Adrian and Mancini-Griffoli (2019), Allen et al. (2020), Bank of Canada et

al. (2020), Bank of England (2020), Boven and Wierts (2020), ECB (2020), Riksbank (2020) or Kiff et al. (2020) for a comprehensive overview.

We research how the intentions for adoption and usage of CBDC current and savings accounts depend on sociodemographic factors, knowledge, dissatisfaction with existing current and savings accounts, importance attached to key characteristics of banking accounts, and trust in own bank, banks in general, the central bank and other people (generalized trust) and financial incentives.

We find a clear potential for CBDC: 49% of the public is interested in opening a CBDC current account, and 54% in opening a CBDC savings account. People see the not-for-profit nature of central banks and its potential robustness against disruption as a rationale for central banks to introduce CBDC. People state they would like to start using CBDC for payments or savings if it were to be better in safeguarding their privacy, protect their money against fraud or theft, and if they were to receive a more attractive interest rate on their balances held in CBDC than on the savings accounts offered by commercial banks. The intended adoption of CBDC depends among other factors on personal characteristics. Among the potential early adopters of CBDC current and savings accounts are relatively many males, academics, people under the age of 35, people with high-income and homeowners (an indicator of social status). In addition, knowledge of CBDC is a key factor that is positively related to the intended adoption of CBDC for paying and saving. The same holds for trust in the own bank, the central bank, and in other people. The stronger the importance attached to privacy and the protection of money against theft/fraud, the stronger the intended usage of CBDC as a means of payment. Moreover, financial incentives matter too. The amount people would want to deposit on the CBDC savings account depends on the interest rate offered.

We contribute to several existing strands of literature. First, we add to the growing literature on the impact of introducing CBDC for commercial banks, by studying consumers' intended usage intensity of CBDC current and savings accounts. According to Fernández-Villaverde et al. (2020) CBDC may endanger the intermediation role of private banks, although it may contribute to social welfare by promoting an efficient exchange between buyers and sellers (Keister and Sanches 2019). Others show that under certain conditions, private banks will still be able to fulfil their intermediation role. For instance, if they are able to borrow reserves from central banks (Andolfatto 2018; Brunnermeier and Niepelt 2019). In case of imperfect competition in the banking sector, the introduction of an interest rate bearing CBDC, if set accurately, may actually promote competition in the deposit and lending market. Only if the central bank sets the interest rate on CBDC too high will disintermediation occur (Chiu et al. 2020). In this connection, disintermediation will not occur as long as the introduction of CBDC does not

affect consumers' payoffs or financial constraints (Brunnermeier and Niepelt 2019). See Carapella and Flemming (2020) for a more extensive overview.

Second, our work relates to research done within the area of bank choice, which focuses on consumers and how they select the bank which will provide them with basic banking services. Anderson et al. (1976) found that most consumers view banks as institutions which offer largely undifferentiated services. They argue that a substantial segment of consumers attaches relatively little importance to banking selection criteria. This is in line with the findings from Martenson (1985), who shows that location and parental influence are important drivers of bank choice and that one out of three respondents randomly chose their bank. These findings indicate that the initial choice of a bank is often not a well advised or well considered decision. According to Devlin and Gerrard (2005), the issue of multiple banking has received far less attention in the literature. They argue that when individuals choose a secondary bank, other factors such as recommendation by others and incentives offered can have a positive effect on the decision to open a secondary bank account. Studies on bank switching behavior provide additional insights on this matter. In particular, Van der Cruijsen and Diepstraten (2017) argue that personal characteristics, the bank-customer relationship, knowledge and socio-psychological variables are important factors in explaining bank switching behavior. Satisfaction is the main reason why people stay at their bank. In line with this, Chakravarty et al. (2004) find that people's propensity to switch positively depends on having experienced problems with the bank. Moreover, the degree to which consumers reallocate their savings to a newly opened or existing savings account depends on the interest rate offered (Gerritsen and Bikker 2020).

Third, we add to studies that show that trust and financial knowledge matter for consumer financial decision-making. We research whether these factors matter for the adoption and usage intention of CBDC current and savings accounts. Prior studies show that generalized trust matters for the financial decisions that individuals make. For example, people who trust others are more likely to participate in the stock market (Balloch et al. 2015), and less likely to default on household debt (Jiang and Lim 2018). Financial decisions also depend on trust in banks. For example, the likelihood of switching banks negatively depends on the level of trust in the own bank (Ampudia and Palligkinis 2018; Hauff 2019; Van der Cruijsen et al. 2020). Trust in the central bank is important for financial decision-making via its beneficial effect on the anchoring of inflation expectations (Schnabel 2020). We expect that trust also drives the adoption of CBDC. Financial knowledge is affecting the decisions consumers make (Lusardi et al. 2014), which is why we expect that intended usage of CBDC also depends on consumer knowledge of CBDC.

Fourth, our work relates to a large body of literature about the drivers of payment behavior. Indeed, the extent to which individuals will actually use a CBDC current account is comparable to the adoption of a new payment method and relates to the medium of exchange

function of money. Existing work emphasizes efficiency. The main reasons why consumers opt for an electronic payment method rather than cash are: acceptance (Bagnall et al. 2016), transaction speed, user-friendliness and safety (Jonker 2007; Schuh and Stavins 2010; Van der Cruijsen and Plooij 2018). Additionally, financial incentives matter (Arango-Arango et al. 2018; Bolt et al. 2010; Stavins 2018; Simon et al. 2010) as well as the ability to control one's budget (Hernandez, Jonker and Kosse 2017). More specifically, our study relates to studies on the adoption of innovations in payments. New payment methods are most popular among young, highly educated males with a higher income, see e.g. Henry et al. (2019) on bitcoin awareness and usage or Jonker et al. (2020) on the preference for contactless payment methods. Also, more general drivers such as compatibility, perceived technology security, performance expectations, innovativeness, and social influence have significant direct and indirect effects over the adoption of mobile payment (Oliveira et al. 2016). Recently, Garratt and Van Oordt (2021) have focused on the public good feature privacy. By paying electronically instead of using cash, people not only reveal information to the seller about themselves, but also about others. Firms can use the information for instance for price discrimination, and also to extract consumer surplus from these other people. However, when faced with the choice on how to pay, consumers fail to fully internalize these costs for others, leading to a suboptimal usage of electronic payments. The issuance of a digital substitute for cash by governments, offering a similar level of privacy as cash may solve this problem. In that case private and social cost are the same, as governments do not have a profit incentive.

The remainder of this paper is structured as follows: Section 2 presents the data and the descriptive results. Section 3 discusses the empirical models and describes the variables included. Section 4 describes the regression results. We end with a discussion and conclusion in Section 5.

2. Data

2.1 Data collection

We conducted a unique survey 'Paying and saving: now and in the future' in order to gain insight into consumers' attitudes towards the current and future payment and saving landscape, with the specific goal of enquiring into consumer preferences concerning CBDC. The survey was held between 18 December 2020 and 5 January 2021 among 3,293 members of the CentERpanel aged 16 and over. The questionnaire was fully completed by 2,522 panel members, corresponding to a response rate of 76.6%. The CentERpanel is a representative online panel of the Dutch speaking population in the Netherlands which has been used extensively by both policymakers and

researchers.[2] We also use information on demographic characteristics of the panel members.[3] We further enrich the dataset with information on trust from two other surveys held among the CentERpanel: information on respondents' trust in the own bank collected in August and September 2020 from the DNB PSD2-Trust survey (Bijlsma et al., 2020) and on respondents' trust in banks in general and in the Dutch central bank from the 2020 DNB Trust Survey (DTS) that was collected in April 2020, see Van der Cruijsen et al. (2020) and Van der Cruijsen et al. (2021) for more information on the annual DTS.

Our survey consists of three parts. The first part covers questions on respondents' opinions about the currently available means of payment for point-of-sale (POS) payments, online payments and for payments among peers (P2P). The second part is on people's opinion on the current and savings accounts offered by commercial banks. The third part – which is most relevant for our study – is on the future payment and savings landscape, with a focus on the introduction of CBDC.

In the third part of our study, after having presented respondents with a general question on their self-assessed prior knowledge on public and private money, commercial bank money and central bank money and CBDC, we provided them with a description of these concepts and with a brief explanation of what is meant by central bank digital currencies (see also Appendix A). Subsequently, we presented the respondents with a list of nine reasons why it would be useful to introduce CBDC, and asked them to indicate what they thought were the most important reasons.[4] They could choose a maximum of three reasons, but they could also opt for 'none of these reasons'. Next, we posed five questions to the respondents about the areas where CBDC should improve on the existing set of payment instruments and bank accounts so that it presents a more attractive option. The factors mentioned are largely based on the requirements for a digital euro as listed in ECB (2020). It concludes with two questions on respondent's willingness to adopt CBDC accounts. We start with the current account by asking respondents the following question: *"Suppose it were possible to open a current account where you could hold an amount of money in CBDC that you can use to pay. How much of your money would you like to deposit in this current account?".* Respondents are then offered the following choices: (1) I don't want to open such a current account, (2) EUR 0, (3) EUR 1–100, (4) EUR 101–500, (5) EUR 501–1,000, (6) EUR 1,001-3,000 and (7) more than EUR 3,000. Finally, the questionnaire includes a question on the willingness to adopt a savings account in CBDC. We present respondents with the following hypothetical situation in which they could divide a sum of money over a standard current account with holdings in commercial bank

[2] For an overview of research using data collected among the CentERpanel see https://www.centerdata.nl/nl/publications.
[3] For more information on CentERpanel and DHS, see Teppa and Vis (2012).
[4] The list of reasons is based on the discussion of preconditions, objectives and design choices for CBDC by Wierts and Boven (2020).

money and a savings account with holdings in CBDC. Next, we split the sample in five random groups to assess how people's decisions depends on differences in savings rates: *"Suppose you have EUR 40,000 in savings. You can divide this amount between a savings account with a balance in CBDC and a standard savings account (with a balance in commercial bank money). You will receive 0.5% interest in the standard savings account. Which part would you like to deposit into a savings account with a credit balance in CBDC if the interest rate on it were 0.25% higher/0.10% higher than/equal to the interest/ 0.10% lower than/0.25% lower than on a standard savings account."* Subsequently, the respondents could choose between seven options on how much money they would put on the CBDC savings account: (1) EUR 0, (2) EUR 1-5,000, (3) EUR 5,001–10,000, (4) EUR 10,001–20,000, (5), EUR 20,001–30,000, (6) EUR 30,001–39,999 and (7) the whole amount, namely EUR 40,000.

2.2 Descriptive results

We start with some insights on what people think of the current payment and savings landscape offered by commercial banks, as it may show which features of current and savings CBDC accounts may offer added value for the public. Respondents are quite content with how they currently make payments. On a 5-point Likert scale (1: very unsatisfied, 5: very satisfied), respondents give POS payments on average a 4.4, and both online payments and P2P payments a 4.2. The various means of payment differ in how consumers perceive them. Respondents could give cash, the debit card and the smartphone a rating on several perception factors using a 7-point Likert scale (1: very low performance, 7: very high performance). They find the debit card the easiest to use (average score: 6.5), fastest (6.3) and safest (6.0) payment instrument of the three considered payment instruments. Cash performs best on privacy (5.8) and helping people to control their spending (5.7), but worst on transaction speed (4.9). The debit card performs worst in helping people to control their spending (4.3). Respondents are also quite satisfied with their current and savings accounts. They give their most important current account on average a score of 4.0 and their most important savings account – in case they have one – a score of 3.8. For both types of bank accounts the satisfaction level was measured using a 5-point Likert scale (1: very unsatisfied, 5: very satisfied).

Regarding the future of paying and saving and the possible role of CBDC therein, we find that 53% of the respondents had not heard about CBDC prior to the survey and 46% had. Most of them, 33% of the respondents, had heard about CBDC, but did not know what it was, and 13% indicated that they knew what was meant by CBDC. Table 1 shows the three most frequently mentioned reasons given by the respondents as to why they think it could be useful to introduce CBDC. People value that the central bank does not have a profit target and is not driven by commercial objectives, in contrast to commercial banks. This reason is mentioned by most

respondents, by all age groups. Also, the improved resilience of the electronic retail payment system that CBDC might bring is among the three most frequently mentioned reasons (no. 2 for people aged 35 and over and no. 3 for people aged 34 and below). However, there are also some differences in the top 3 reasons between the age groups, reflecting different preferences. For instance, young people often mention the lower environmental footprint that digital banknotes have compared to traditional cash (no. 2). People aged 55 and over mention the improved safety of digital banknotes compared to cash as an important reason for introducing CBDC (no. 3), while those aged between 35 and 54 often mention the decreased dependency of citizens and businesses on commercial banks that a possible introduction of CBDC might entail. Other possible reasons for introducing CBDC, like improved payments in or to other European countries are cited less often by the public (Table C.1 in Appendix C provides a full list). Note that 30% of the respondents found none of these reasons important. The share increases with age.

Table 1. Top 3 reasons why the public thinks it can be useful to introduce CBDC

	Whole sample	
1	A central bank does not have a profit target and does not have to make money from customers	35%
2	If the mainstream electronic retail payments system is not functional due to disruption, citizens and businesses are still able to pay with digital banknotes	26%
3	CBDC is safer than cash	23%
	None of these reasons	30%
	Age 16 - 34	
1	A central bank does not have a profit target and does not have to make money from customers	29%
2	Digital banknotes have a lower environmental footprint than cash money	28%
3	If the mainstream electronic retail payments system is not functional due to a disruption, citizens and businesses are still able to pay with digital banknotes	26%
	None of these reasons	24%
	Age 35 - 54	
1	A central bank does not have a profit target and does not have to make money from customers	32%
2	If the mainstream electronic retail payments system is not functional due to a disruption, citizens and businesses are still able to pay with digital banknotes	26%
3	CBDC make citizens and businesses less dependent on commercial banks. By doing so, there will still be public money for public use, as an alternative for coins and paper banknotes	23%
	None of these reasons	30%
	Age 55 and over	
1	A central bank does not have a profit target and does not have to make money from customers	37%
2	If the mainstream electronic retail payments system is not functional due to a disruption, citizens and businesses are still able to pay with digital banknotes	26%
3	CBDC is safer than cash	25%
	None of these reasons	32%

Note: Number of respondents 2,535. There are 302 respondents aged between 16 and 34, 763 respondents aged between 35 and 54 and 1,470 respondents aged 55 and over. Respondents were asked to give three possible reasons why it may be useful to introduce digital euro banknotes.

Although most respondents are satisfied with the current and savings accounts offered by commercial banks, the public might be interested in opening a current or savings account with CBDC funds if they perceive one or more areas where these accounts improve on the current offer. We asked respondents in which areas these accounts should perform better than existing bank accounts. Table 2 lists the three areas that were most mentioned per type of account and by age group. The area mentioned most often is that CBDC accounts should provide better protection against theft or fraud of money in the accounts. The share of people who find this a reason to open a CBDC account increases with age. Furthermore, obtaining a higher rate of interest is in the top 3

reasons: 34% of the respondents would open a CBDC savings account for this reason (no. 2), and 20% a current account (no. 3). Losing less money in case of bankruptcy is frequently mentioned for opening a CBDC savings account by people aged 55 and over (no. 3, together with privacy protection).

Table 2. Areas where CBDC accounts should improve on commercial bank accounts

Current account	Share	Savings account	Share
Whole sample			
1. Protection of the money in your account against theft/fraud	31%	1. Protection of your savings in your account against theft/fraud	35%
2. Privacy protection	23%	2. interest rate received over positive balance	34%
3. Interest rate received over positive balance	20%	3. Privacy protection	26%
None of these reasons	19%	None of these reasons	22%
Age 16 - 34			
1. Privacy protection	21%	1. Interest rate received over positive balance	32%
2. Protection of the money in your account against theft/fraud	20%	2. Protection of your savings in your account against theft/fraud	27%
3. Risk of losing your money in case of bankruptcy	19%	3. Privacy protection	25%
None of these reasons	18%	None of these reasons	20%
Age 35 - 54			
1. Protection of the money in your account against theft/fraud	25%	1. Interest rate received over positive balance	38%
2. Privacy protection	24%	2. Protection of your savings in your account against theft/fraud	29%
3. Interest rate received over positive balance	22%	3. Privacy protection	28%
None of these reasons	19%	None of these reasons	22%
Age 55 and over			
1. Protection of the money in your account against theft/fraud	37%	1. Protection of your savings in your account against theft/fraud	39%
2. Privacy protection	24%	2. Interest rate received over positive balance	33%
3. Interest rate received over positive balance	19%	3. Privacy protection	25%
None of these reasons	19%	None of these reasons	23%

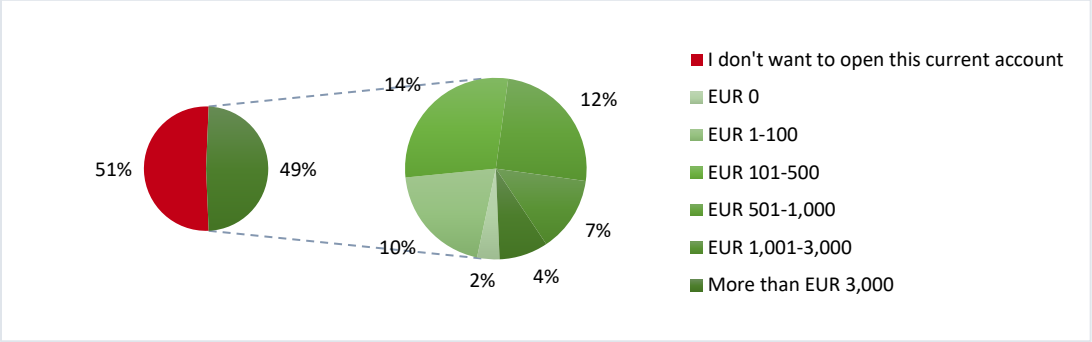
Note: This table reports the percentage breakdown in the total number of answers about the three areas where CBDC accounts should improve on commercial bank accounts. Respondents were free to formulate other reasons than the ones mentioned in the list. 2,525 respondents answered the question for current accounts and 2,523 for saving accounts. Tables C.2 and C.3 in Appendix C provide lists of all possible reasons put in order.

The last part of our questionnaire sheds light on the adoption intention for both the CBDC current account and the CBDC savings account. The numbers from these questions provide useful insights on the general willingness of opening a CBDC account under different circumstances.

First, 49% of the respondents indicated that they would open a CBDC current account (see Figure 1). From those who indicated they would be willing to open a CBDC current account, the largest group chose to transfer EUR 101-500 to this CBDC current account. As only a smaller portion of the respondents willing to open a CBDC current account would transfer nothing or at most EUR 100, it is likely that once people are willing to open a CBDC current account, they would transfer substantial amounts to this account. This indicates that a CBDC current account is not only seen as a nice-to-have, but is something that people would actively use.[5]

[5] The response shares in Figure 1 and the lower and upper bound of the balance categories above EUR 0 suggests that, on average, the Dutch would transfer between EUR 260 and EUR 700 to the CBDC current account. These amounts correspond with 10–25% of the average balance of EUR 2,800 that Dutch citizens had on their current account in 2019.

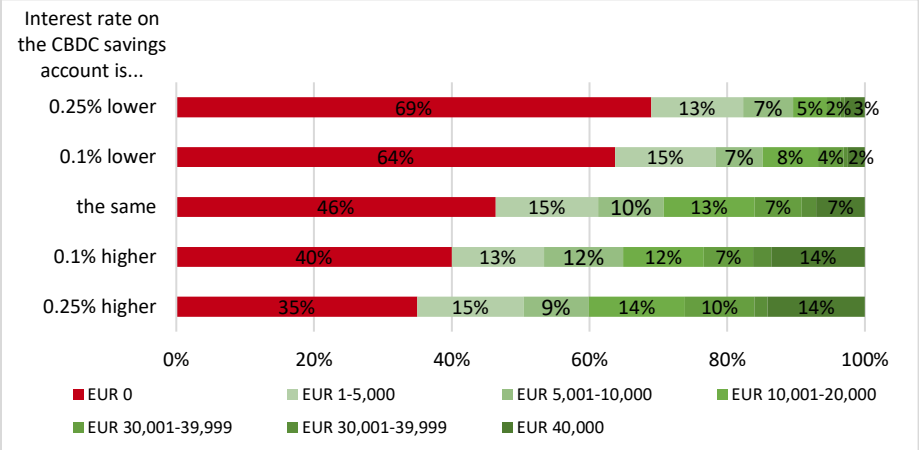
Figure 1. Adoption rates and intended usage of a CBDC current account
Response shares



Source: CentERpanel. *Note*: 2,523 observations.

Next, in the last question about how respondents would allocate EUR 40,000, between a CBDC savings account and a standard savings account, 54% of respondents indicated they would be willing to put money in the CBDC savings account in the scenario where the interest rate is the same as for a standard savings account. The interest rate offered on a CBDC savings account compared to the interest rate on a standard savings account has an effect on the extent to which people intend to use CBDC (see Figure 2). In general, more respondents would be willing to transfer money to a CBDC account if the interest rate were higher than for the standard savings account. Additionally, the amount of money that respondents are willing to transfer in this scenario is higher. The opposite trends are found when the randomly assigned interest rate is lower compared to the interest rate on the standard savings account.

Figure 2. Adoption rates and intended usage of a CBDC savings account, broken down by (randomly assigned) interest rate
Response shares



Source: CentERpanel. *Note*: 2,522 observations split into five random groups.

3. Empirical models

Our primary focus in the regressions is to measure how the intended use of a CBDC current account and CBDC savings account is related to consumers' demographics, knowledge of CBDC, satisfaction with the current situation, trust in the own bank (narrow-scope trust), trust in the

central bank and trust in banks in general (broad-scope trust), as well as the importance attached to money protection, data protection and privacy. In the case of the CBDC savings account, we also research the importance of the interest rate offered by the central bank.

3.1. CBDC current account

First, we model the adoption and intensity of usage of a CBDC current account. The adoption of a CBDC current account is modelled by estimating probit models, which is similar to the first stage of a Heckman selection model. The dependent variable is *CBDC current account: adoption*, which is a binary dummy that is 1 for respondents that want to adopt a CBDC current account and 0 for other respondents. We use a two-stage Heckman selection model to estimate the intensity of use of the CBDC current account. In the second stage, the ordered probit model explains the intensity of usage of the CBDC current account given that one wants a CBDC current account. The dependent variable is *CBDC current account: intensity of usage*, which is an ordered variable that reflects the amount respondent would like to deposit (1 = EUR 0, 2 = EUR 1-100, 3 = EUR 101-500, 4 = EUR 501-1,000, 5 = EUR 1,001-3,000, 6 = more than EUR 3,000).

As explanatory variables we include a wide range of consumers' demographics. The dummy *male* captures gender and is 1 for males and 0 for females. The age dummies *between 35 and 44*, *between 45 and 54*, *between 55 and 64*, *65 and over* capture the age of the respondent (reference category: *34 and below)*. For example, *between 35 and 44* is 1 for respondents who are between 35 and 44 and 0 for other respondents. The variable *education: bachelor or higher* is 1 for respondents who successfully completed higher vocational or university education and 0 for lower-educated respondents. Three income dummies capture differences in the household net monthly income: *income: EUR 1,151-1,800*, *income: EUR 1,801-2,600*, *income: > EUR 2,600* (reference category: *Income: ≤ EUR 1150*). As proxy for wealth we include *homeowner*, which is 1 for homeowners and 0 else. *Household head lives with partner* is 1 if the head of the household lives together with a partner and otherwise it is 0. *Degree of urbanization* captures the address density of the respondent and ranges from 1 (address density is 500 per km^2 or less) to 5 (address density of more than 2,500 per km^2). We also control for the region people live in by including the region dummies *region: north*, *region: east*, and *region: south* (reference category: *region: west*) that are 1 for respondents who live in the mentioned region and 0 for others.

We also relate the intention to adopt a CBDC current account and the intensity of use to knowledge of CBDC. We include two dummy variables that capture self-assessed knowledge of CBDC. *Knowledge CBDC: low* is 1 for respondents who have heard of CBDC but do not know what it is and 0 else. *Knowledge CBDC: high* is 1 for respondents who know what is meant with CBDC. Respondents that have never heard of CBDC are in the reference group.

In addition, we include a variable that captures current dissatisfaction with one's primary current account. The dummy variable *dissatisfied current account* captures respondents' dissatisfaction with their main current account and equals 1 if respondents' are not satisfied and 0 otherwise.

Furthermore, we include measures of the importance attached to the three most often mentioned key characteristics of a current account (CA): *importance money protection CA*, *importance data protection*, and *importance privacy CA*. The latter two variables range from 1 "absolutely not important" to 5 "very important" and capture the importance people attach to (1) protection against theft/fraud of the money on the account, (2) the bank not sharing their payments data with others, and (3) safeguarding privacy. *Importance money protection CA* ranges from 2"unimportant" to 5 "very important" because there were no respondents answering "absolutely not important".

In addition, we include variables that capture respondents' trust in banks and the central bank. We expect that the intention to adopt and use a CBDC current account is especially attractive for people with low trust in their own bank and other banks in general; the CBDC current account may then offer a good alternative. We foresee a positive relationship between the intention to adopt and use a CBDC account and trust in the central bank. Using data from the DNB PSD2-Trust survey we build *narrow-scope trust,* which reflects trust in the own bank (1 = very little trust, 2 = little trust, 3 = sufficient trust, 4 = much trust, 5 = very much trust). Data from the 2020 DTS is used to construct *trust in the central bank* and *broad-scope trust*, which reflects trust in banks in general. These variables both range from 1 to 4 (1 = absolutely no trust, 2 = not so much trust, 3 = fairly much trust, 4 = a lot of trust).

We also include *generalized trust* to capture trust in other people. This variable is 1 for respondents that answered that most people can be trusted and 0 otherwise. Generalized trust is often measured as the share of a population answering yes to the following question from the World Values Survey (WVS): 'In general, do you think that most people can be trusted, or can't you be too careful in dealing with people?' (e.g. Aghion et al. 2010). We use a similar question: ''Generally speaking would you say that most people can be trusted or that you cannot be too careful in dealing with people?''.

3.2. CBDC savings account

Second, we model the intensity of usage of a CBDC savings account. We run ordered probit models with *CBDC savings account: intensity of usage* as dependent variable. This is an ordered variable capturing the amount of money people would put on a CBDC savings account if they would have EUR 40,000 to divide between a standard savings account and a CBDC savings account (1 = EUR

0, 2 = EUR 1-5,000, 3 = EUR 5,001-10,000, 4 = EUR 10,001-20,000, 5 = EUR 20,001-30,000, 6 = 30,001-39,999, 7 = EUR 40,000).

With respect to the explanatory variables there are three differences compared to the CBDC current account regressions. First, instead of *dissatisfied current account* we include *dissatisfied savings account*. This dummy variable equals 1 if respondents' are not satisfied with their main savings account, and 0 otherwise. Second, we include measures of the importance attached to the three most often mentioned key characteristics of a savings account (SA): *importance money protection SA*, *importance privacy SA*, and *importance amount of money safeguarded against bankruptcy*. These variables range from 1 "absolutely not important" to 5 "very important" and capture the importance people attach to (1) protection against theft/fraud of the money on the savings account, (2) safeguarding privacy, and (3) the amount of money they get back in case their bank goes bankrupt. Third, we add four interest rate dummies: *interest rate: 0.25% lower, interest rate: 0.1% lower, interest rate: 0.1% higher, interest rate: 0.25% higher*. These capture how the interest rate on the CBDC savings account compares to the interest rate on a standard savings account. For example, *interest rate: 0.25% lower* is 1 for respondents that got a hypothetical situation in which the interest rate on the CBDC savings account was 0.25% higher, and 0 for the respondents in the other four groups. Respondents in the reference group got a scenario in which there was no interest rate differential.

4. Regression results

4.1. CBDC current account

Adoption

Table 3 shows the results of the CBDC current account adoption regressions. The first model includes only consumer demographics (column 1), the second model also includes the knowledge variables, dissatisfaction with the current account and the importance attached to the top three aspects of the current account (column 2), and the third model is the full model with also the trust variables included (column 3).

The likelihood that someone intends to open a CBDC current account is related to various personal characteristics (Table 3, column 1). Males are 12 percentage points more likely to have the intention to open such an account than females. People younger than 35 years are more likely to have the intention to open a CBDC current account than older people. Higher educated people are 6 percentage points more likely to have this adoption intention than lower educated people. People belonging to a household with a net monthly income of EUR 2,600 or more are 7 percentage points more likely to have the intention to open a CBDC current account than people with a household income of EUR 1,150 or less. Homeowners are 5 percentage points more likely

to intend to adopt a CBDC current account that people who do not own a house. The likelihood is 5 percentage points lower for people living in a household where the household head has a partner. The intention to adopt a CBDC current account is positively related to the degree of urbanization of one's place of residence. The adoption intention does not depend on the region people live in (the north, east, south or west of the Netherlands).

Table 3. The intention to adopt a CBDC current account

	(1)	(2)	(3)
Male	0.12***	0.11***	0.09***
	(0.02)	(0.02)	(0.02)
Between 35 and 44	-0.09**	-0.10**	-0.05
	(0.04)	(0.04)	(0.05)
Between 45 and 54	-0.12***	-0.13***	-0.09*
	(0.04)	(0.04)	(0.05)
Between 55 and 64	-0.11***	-0.13***	-0.11**
	(0.04)	(0.04)	(0.05)
65 and over	-0.13***	-0.16***	-0.13***
	(0.03)	(0.03)	(0.04)
Education: bachelor or higher	0.06***	0.06**	0.03
	(0.02)	(0.02)	(0.03)
Income: EUR 1,151-1,800	-0.04	-0.04	-0.03
	(0.04)	(0.04)	(0.05)
Income: EUR 1,801-2,600	0.02	0.02	0.06
	(0.04)	(0.04)	(0.05)
Income: > EUR 2,600	0.07*	0.07	0.08
	(0.04)	(0.04)	(0.05)
Homeowner	0.05**	0.05**	0.03
	(0.03)	(0.03)	(0.03)
Household head lives with partner	-0.05*	-0.05*	-0.04
	(0.03)	(0.03)	(0.03)
Degree of urbanization	0.02**	0.02**	0.02**
	(0.01)	(0.01)	(0.01)
Region: north	0.02	0.02	0.04
	(0.04)	(0.04)	(0.04)
Region: east	-0.03	-0.03	-0.02
	(0.03)	(0.03)	(0.03)
Region: south	-0.02	-0.03	-0.02
	(0.03)	(0.03)	(0.03)
Knowledge CBDC: low		0.06***	0.07***
		(0.02)	(0.02)
Knowledge CBDC: high		0.14***	0.17***
		(0.03)	(0.03)
Dissatisfied with current account		0.04	0.05
		(0.05)	(0.06)
Importance money protection CA		0.02	0.00
		(0.02)	(0.03)
Importance data protection		0.01	0.02
		(0.02)	(0.02)
Importance privacy CA		0.05**	0.04*
		(0.02)	(0.02)
Narrow-scope trust in banks			0.04**
			(0.02)
Broad-scope trust in banks			-0.03
			(0.02)
Trust in the central bank			0.03
			(0.02)
Generalized trust			0.09***
			(0.03)
Observations	2,496	2,496	1,856
Pseudo R2	0.03	0.04	0.05
Log pseudolikelihood	-1677.43	-1654.34	-1216.83
Wald χ^2	99.11***	135.37***	122.57***

Note: The table reports average marginal effects of probit regressions. Standard errors are clustered by household and shown in parentheses. The dependent variable is a dummy capturing the intention to open a CBDC current account (1 = yes, 0 = no). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level, respectively.

The likelihood that someone intends to open a CBDC current account correlates positively with knowledge of CBDC and the importance people attach to privacy (Table 3, column 2). People who have heard of CBDC but do not know what it is are 6 percentage points more likely to intend to adopt CBDC than people who have not heard of CBDC (the reference group). The likelihood is 14 percentage points higher for people with high CBDC knowledge – so people who know what CBDC is – than people who have not heard of CBDC. People who find safeguarding privacy very important are 10 percentage points more likely to intend to adopt the CBDC current account than people with a neutral standpoint regarding the importance of privacy. The adoption intention does not depend on the importance people attach to money and data protection and on being dissatisfied with the current account. The income effect is no longer significant in column 2.

Furthermore, trust is a relevant factor: the likelihood of the intention to adopt a CBDC current account is relatively high for people with much trust in their own bank and for people with much trust in other people (Table 3, column 3). It is unrelated to trust in the central bank and trust in banks in general. For example, people with very much trust in their own bank are 16 percentage points more likely to intend to adopt the CBDC current account than people with very little trust in their own bank. This suggests that people with very little trust in their own bank are often also distrustful of the central bank or in general dislike financial products. The adoption intention is 9 percentage points higher for people who trust others than for people who distrust others. Several of the effects of sociodemographic variables are not robust to the inclusion of these trust variables. This suggests that trust correlates with some of the demographic variables. The likelihood to intend to adopt a CBDC current account does not depend anymore on education, homeownership and the household head having a partner. Regarding age, now only people aged 45 or above have a lower intention to adopt a CBDC current account than people aged 34 or younger.

Intensity of usage

The intended intensity of usage of the CBDC current account – the amount put on the CBDC current account – depends on personal characteristics, trust in the central bank and banks in general and the importance attached to protection of money on the current account against theft/fraud. Table 4 reports parameter estimates from the second stage of the Heckman selection model.[6] The three models explain the intensity of usage of the CBDC current account by people who intend to adopt the CBDC account. In the first model with only sociodemographic factors, the intensity of usage is unrelated to sociodemographic factors (Table 4, column 1). However, based on the second model (Table 4, column 2) we find several significant relationships. The amount put on the CBDC current

[6] The coefficient of the inverse Mills ratio (lambda) is positive and significant in the third model (Table 4, column 3). So without correction, the coefficient estimates would have been upward-biased.

Table 4. The intended intensity of usage of a CBDC current account

	(1)	(2)	(3)
Male	0.67	0.92**	1.07***
	(0.69)	(0.43)	(0.33)
Between 35 and 44	-0.22	-0.49	-0.56**
	(0.56)	(0.41)	(0.26)
Between 45 and 54	-0.13	-0.47	-0.62*
	(0.72)	(0.53)	(0.35)
Between 55 and 64	0.15	-0.27	-0.56
	(0.63)	(0.53)	(0.43)
65 and over	-0.02	-0.48	-0.84*
	(0.78)	(0.61)	(0.50)
Education: bachelor or higher	0.42	0.52**	0.47***
	(0.35)	(0.22)	(0.14)
Income: EUR 1,151-1,800	0.08	0.01	-0.00
	(0.27)	(0.21)	(0.22)
Income: EUR 1,801-2,600	0.28	0.36**	0.71**
	(0.18)	(0.17)	(0.29)
Income: > EUR 2,600	0.38	0.53*	0.82**
	(0.45)	(0.30)	(0.37)
Homeowner	0.31	0.43**	0.43***
	(0.33)	(0.22)	(0.15)
Household head lives with partner	-0.11	-0.22	-0.27
	(0.30)	(0.20)	(0.17)
Degree of urbanization	0.07	0.11	0.18**
	(0.13)	(0.08)	(0.08)
Region: north	0.04	0.10	0.31*
	(0.15)	(0.13)	(0.19)
Region: east	-0.19	-0.25*	-0.22*
	(0.20)	(0.15)	(0.13)
Region: south	-0.06	-0.11	-0.09
	(0.15)	(0.12)	(0.11)
Knowledge CBDC: low		0.31	0.52**
		(0.24)	(0.26)
Knowledge CBDC: high		0.94*	1.44**
		(0.53)	(0.62)
Dissatisfied with current account		-0.05	0.03
		(0.22)	(0.26)
Importance money protection CA		0.21**	0.18**
		(0.10)	(0.08)
Importance data protection		0.03	0.18
		(0.09)	(0.12)
Importance privacy CA		0.30	0.34**
		(0.21)	(0.17)
Narrow-scope trust in banks			0.20
			(0.16)
Broad-scope trust in banks			-0.25**
			(0.11)
Trust in the central bank			0.44***
			(0.13)
Generalized trust			0.77**
			(0.34)
Lambda	1.39	2.76	4.30**
	(3.62)	(2.30)	(2.18)
Observations	1,214	1,214	882
Pseudo R2	0.03	0.04	0.05
Log pseudolikelihood	-1928.46	-1915.31	-1380.50
Wald χ^2	118.02***	140.96***	123.18***

Note: The table reports parameter estimates from the second stage of the Heckman selection model (ordered probit regressions) in which adoption is the first stage. Standard errors are clustered by household and shown in parentheses. The dependent variable is an ordered variable capturing the amount one intends to put on the CBDC account (1 = EUR 0, 2 = EUR 1-100, 3 = EUR 101-500, 4 = EUR 501-1,000, 5 = EUR 1,001-3,000, 6 = more than EUR 3,000). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level, respectively.

account is higher for males than females. For example, males are 8 percentage points less likely to deposit nothing and 14 percentage points more likely to deposit the highest amount (EUR 3,000 or more). The amount is also higher for higher educated people than for people with a low level

of education. In addition, the amount correlates positively with the household income and homeownership (our wealth proxy). People living in the east of the Netherlands would put less money on the CBDC account than people living in the west.

Those who know what CBDC entails say they would use the CBDC current account more intensively than people who have never heard of CBDC. For example, they are 8 percentage points less likely to deposit no money and 14 percentage points more likely to deposit EUR 3,000 or more. The intended intensity of usage is also positively related to the importance people attach to protection of money against theft/fraud. The effects found are stronger when we include the trust variables (Table 4, column 3). Regarding knowledge of CBDC, we now find that people who have only heard of CBDC intend to more intensively use the CBDC account than people who had never heard of CBDC. The intensity of usage is now significantly positively related to the importance people attach to privacy. Inhabitants in the north of the Netherlands intend to put more money on the CBDC account than people living in the west of the Netherlands. The intended intensity of usage positively depends on the degree of urbanization of the place of residence. Moreover, we find that the intended amount put on the CBDC current account is lower for people between 35 and 55 than for people below 35. The same holds for people aged 65 and over.

The higher trust in the central bank is and the lower trust in banks in general is, the higher the amount that people intend to put on the CBDC current account. For example, people who trust the central bank a lot are 11 percentage points less likely to deposit EUR 0 than people who absolutely do not trust the central bank and 20 percentage points more likely to deposit the highest amount (EUR 3,000 or more). People who trust others intend to put a larger amount on the CBDC account than people who distrust others. People who trust others are 6 percentage points less likely to deposit nothing and 11 percentage points more likely to opt for EUR 3,000 or more.

4.2. CBDC savings account

Table 5 shows the regression results for the CBDC savings account, where we examine how much of their hypothetical EUR 40,000 of savings respondents would put on the CBDC savings account. The first model includes various personal characteristics (column 1). The second model also includes the knowledge variables, dissatisfaction with their current savings account and variables capturing the importance attached to the top three features of the savings account (column 2). The third model adds variables reflecting the difference in interest rate of the CBDC current account relative to the standard savings account (column 3). The full model also includes the trust variables (column 4).

Table 5. The intended intensity of usage of a CBDC savings account

	(1)	(2)	(3)	(4)
Male	0.26***	0.26***	0.29***	0.28***
	(0.04)	(0.05)	(0.05)	(0.06)
Between 35 and 44	-0.26***	-0.25***	-0.25***	-0.19
	(0.09)	(0.10)	(0.10)	(0.13)
Between 45 and 54	-0.20**	-0.21**	-0.20**	-0.17
	(0.08)	(0.09)	(0.09)	(0.12)
Between 55 and 64	-0.20**	-0.24***	-0.25***	-0.19*
	(0.08)	(0.09)	(0.08)	(0.11)
65 and over	-0.30***	-0.34***	-0.34***	-0.27**
	(0.07)	(0.08)	(0.08)	(0.11)
Education: bachelor or higher	0.11**	0.11**	0.11**	0.09
	(0.05)	(0.05)	(0.05)	(0.06)
Income: EUR 1,151-1,800	0.09	0.19	0.17	0.25*
	(0.11)	(0.12)	(0.12)	(0.15)
Income: EUR 1,801-2,600	0.21**	0.29**	0.24**	0.33**
	(0.10)	(0.11)	(0.11)	(0.15)
Income: > EUR 2,600	0.19*	0.28**	0.23**	0.30**
	(0.10)	(0.11)	(0.11)	(0.15)
Homeowner	0.00	-0.03	-0.03	-0.02
	(0.06)	(0.07)	(0.07)	(0.08)
Household head lives with partner	-0.02	-0.02	-0.01	0.03
	(0.06)	(0.06)	(0.06)	(0.07)
Degree of urbanization	0.03	0.02	0.02	0.04
	(0.02)	(0.02)	(0.02)	(0.02)
Region: north	0.04	0.05	0.06	0.19*
	(0.08)	(0.08)	(0.08)	(0.10)
Region: east	-0.11*	-0.15**	-0.14**	-0.11
	(0.07)	(0.07)	(0.07)	(0.08)
Region: south	-0.04	-0.04	-0.04	-0.05
	(0.06)	(0.07)	(0.07)	(0.08)
Knowledge CBDC: low		0.13**	0.14***	0.12*
		(0.05)	(0.05)	(0.06)
Knowledge CBDC: high		0.22***	0.19**	0.22**
		(0.08)	(0.08)	(0.09)
Dissatisfied savings account		0.16*	0.15*	0.20**
		(0.08)	(0.08)	(0.10)
Importance_money protection SA		0.12*	0.13**	0.15**
		(0.06)	(0.06)	(0.07)
Importance privacy SA		0.05	0.06	0.08
		(0.05)	(0.05)	(0.06)
Importance amount of money safeguarded against bankruptcy		0.01	-0.01	-0.01
		(0.04)	(0.04)	(0.05)
Interest rate: 0.25% lower			-0.61***	-0.56***
			(0.08)	(0.09)
Interest rate: 0.1% lower			-0.45***	-0.44***
			(0.08)	(0.09)
Interest rate: 0.1% higher			0.24***	0.29***
			(0.07)	(0.08)
Interest rate: 0.25% higher			0.33***	0.35***
			(0.07)	(0.08)
Narrow-scope trust in banks				-0.00
				(0.05)
Broad-scope trust in banks				-0.08
				(0.06)
Trust in the central bank				0.14**
				(0.06)
Generalized trust				0.08
				(0.07)
Observations	2,495	2,277	2,277	1,699
Pseudo R2	0.01	0.01	0.05	0.05
Log pseudolikelihood	-3729.48	-3410.71	-3295.88	-2402.84
Wald χ^2	71.88***	94.13***	309.67***	237.80***

Note: The table reports parameter estimates of ordered probit regressions. Standard errors are clustered by household and shown in parentheses. The dependent variable captures the amount of money people would put on CBDC savings account if they would have EUR 40,000 to divide between a standard savings account and a CBDC savings account (1 = EUR 0, 2 = EUR 1-5,000, 3 = EUR 5,001-10,000, 4 = EUR 10,001-20,000, 5 = EUR 20,001-30,000, 6 = EUR 30,001-39,999, 7 = EUR 40,000). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level, respectively.

First, the likelihood of depositing a certain amount on a CBDC savings account is related to various personal characteristics (Table 5, column 1). Males intend to deposit significantly higher amounts on a CBDC savings account than females. In addition, people who obtained a bachelor degree or higher express a higher usage intensity than people who obtained a lower educational level. Age also matters: people aged 35 and over intend to deposit lower amounts on the CBDC savings account than people aged 34 or less (reference group). Furthermore, people belonging to a household with a net monthly income of EUR 1,801 or higher intend to deposit higher amounts on the CBDC savings account than people with a household income of EUR 1,150 or less. Lastly, there are regional differences in intended usage intensity; people living in the eastern part of the Netherlands are less prone to deposit money on the CBDC savings account than people living in the western part. There is no effect of wealth, as measured by homeownership.

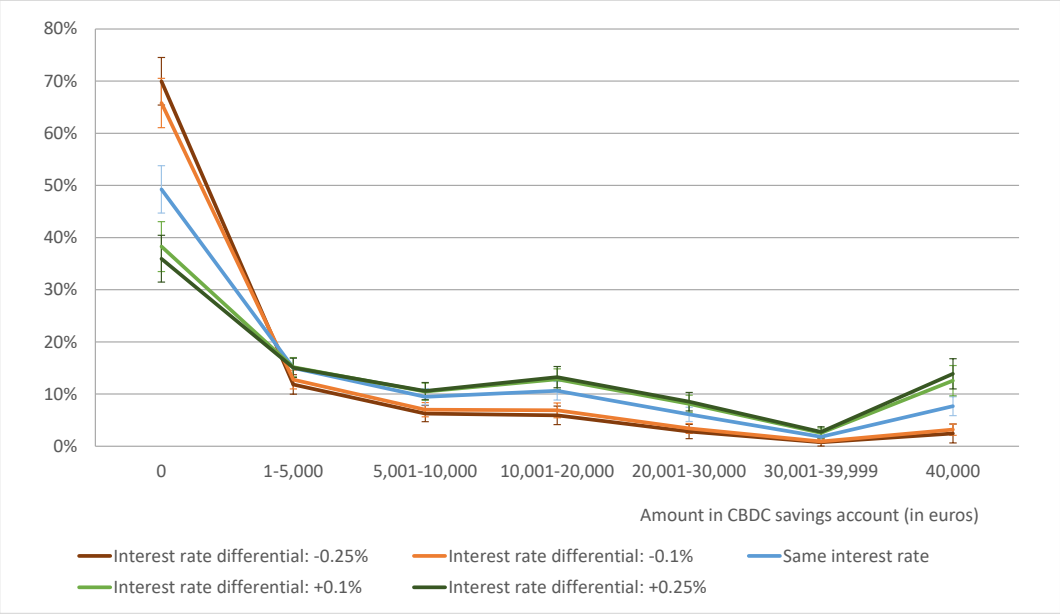
Second, people's self-assessed knowledge of CBDC is positively related to how much money they would put on the CBDC savings account (Table 5, column 2). For instance, people with a high knowledge of CBDC are 9 percentage points less likely to put no money on it and 3 percentage points more likely to put the whole amount on it than someone who has never heard before of CBDC (reference person). In line with our expectations, we see that respondents who are not satisfied with their own main savings account intend to put a higher share of the EUR 40,000 on the CBDC savings account than others; they are 6 percentage points less likely to put nothing on it and 2 percentage points more likely to put everything on it.

Third, only one of the three importance measures that reflect key characteristics of savings accounts according to the public have a significant effect on intended usage intensity of CBDC savings account (Table 5, column 2). Usage intensity increases with how much importance people attach to money protection, i.e., how well their savings are protected against theft or fraud, but it is unrelated with the importance they attach to safeguarding their privacy and of getting their money back in case of bankruptcy.

Fourth, interest rate differentials matter (Table 5, column 3). The impact of positive and negative interest rate differentials are not symmetric: negative interest rate differentials have a larger impact than positive interest rate differentials. Figure 3 depicts for each interest rate differential the estimated likelihoods of the amounts deposited on a CBDC savings account. In case of no interest rate differential (blue line) the estimated likelihood that a respondent would not put a single euro on the CBDC savings account is 49% and that he would put the full amount on it is 8%. Of the five intermediate options, the estimated likelihood of the second lowest option "EUR 1–5,000" is highest, i.e. 15%, and the second highest option "EUR 30,001–39,999" is lowest, i.e. 2%. The interest rate differentials have a relatively large impact on the two extreme options. In case of a negative interest rate difference of 0.1% the likelihood that someone would not put a single euro on the CBDC savings account increases by 17 percentage points to 66% compared to the

baseline situation and that he would put the full EUR 40,000 on it drops by 4 percentage points to 3%. In case of a positive interest rate differential of 0.1% the estimated likelihood that he would not put any money on the CBDC savings account is 38%, i.e. 11 percentage points less than without the interest rate differential, and the likelihood that he would put the full amount on it would be 13%, 5 percentage points more than in the baseline situation. As visually represented in Figure 3, the sign of the difference is important, with negative interest rate differentials having larger impacts than positive ones. It also suggests that the size of the interest rate difference matters less. The 95%-confidence intervals of the estimated likelihoods of the -0.1% and -0.25% are overlapping, and the same holds for those corresponding to the interest rate differentials +0.1% and +0.25%. Wald tests do not reject equality of the estimated parameters for the -0.1% and -0.25% interest rate differentials (p=0.22) and for the 0.1% and 0.25% interest rate differentials (p=0.47).

Figure 3. The likelihood of depositing money on a CBDC savings account for different interest rate differentials.



Note: The figure shows the likelihood of depositing a particular amount in a CBDC savings account for different levels of interest rate differentials with 95% confidence intervals.

Fifth, we find that trust in the central bank matters, but trust in banks and generalized trust do not (Table 5, column 4). If trust in the central bank rises by 1 point (on a 4-point scale), the likelihood of not depositing money in the CBDC savings account would drop by 5 percentage points, whereas the likelihood of depositing the full amount would rise by 2 percentage points.

As a robustness check we also estimated our models on usage intensity of the CBDC savings account including only the respondents who would deposit at least EUR 1. This roughly halves our sample size. Table D.1 in Appendix D provides the estimation results. The effects for gender and interest rate differentials all remain significant, while the variables reflecting a high

education and living together with a partner both become significant and have a positive impact on usage intensity. However, the variables reflecting age, income, dissatisfaction with the current savings account, importance attached to money protection, knowledge of CBDC and the different trust indicators are no longer significant. This suggests that only gender and the interest rate differential influence both the decision to open a CBDC savings accounts and their intended usage intensity, while the other variables mainly have a positive influence on the decision to open a CBDC savings account.

5. Conclusion and discussion

Our research shows that there is a clear potential for success of a digital form of public money issued by the central bank, next to banknotes. For both the CBDC current account and savings account we find that roughly half of the public indicates willingness to open these accounts. This suggests that consumers perceive CBDC as distinct from current and savings accounts offered by traditional banks. Indeed, when asked to list the most important reasons why the public thinks it is useful to introduce a CBDC, respondents list the not-for-profit nature of a central bank as one of the main reasons.

We identify several factors that influence the public's interest in CBDC. First, personal characteristics matter. Males, people under 35, people with high-income and homeowners (an indicator of wealth) are more likely to adopt CBDC than others. Also, respondents' knowledge in CBDC matters. Compared to people without any knowledge of CBDC, people who know more about CBDC have more intention of opening a CBDC current or savings account, and intend to deposit larger amounts on the CBDC current account. The extent to which people value privacy also relates positively to their intention to open a CBDC current account. Regarding usage intensity of the CBDC current account there is also a clear role for the importance attached to money protection.

Furthermore, we find that trust is a relevant factor. However, the kind of trust that matters differs per type of account. People with a higher degree of narrow-scope trust (trust in their own main bank) and generalized trust (trust in other people) are more likely to open a CBDC current account than others. The amount of money they want to deposit on it relates positively with their trust in the central bank and negatively with broad-scope trust in banks. Usage intensity of the CBDC current account relates positively with generalized trust. Regarding the CBDC savings account, only trust in the central bank correlates positively with the intention to open such an account, but none of the trust factors correlates with its usage intensity.

Last, but not least, we find that interest rate differentials matter. The amount of money that people intend to deposit on the CBDC savings account is higher if the central bank offers a higher interest rate than commercial banks, and is lower if the central bank offers less. The

magnitude of the interest rate differentials does not seem to matter, only the sign. Further research may be needed to gain more insight in how interest rate setting by the central bank affects CBDC usage intensity. In addition, it may be important to study the role of price incentives on the public's intention to adopt a CBDC current account. Fees for current accounts vary widely internationally (see e.g. European Commission 2006). For central banks in countries where banks are 'fee oriented' with relatively high consumer fees for current accounts it may be easier to set a fee that is considered as attractive by consumers than for central banks in countries where banks set relatively low consumer fees, because they are 'efficiency focused' or because they cross-subsidize retail payments with other services.

Overall, we conclude that from the consumer perspective there is a clear potential for central banks to introduce CBDC. Next to the not-for-profit nature of central banks, people see the potential robustness against disruption as a rationale to introduce CDBC and would like it to safeguard their privacy and protect their money against fraud or theft.

Our results suggest several ways in which central banks can steer consumers' usage of CBDC as a means of payment or saving. First, by a design of CBDC that takes into account the public's need for security and privacy. Second, central banks should clearly communicate towards the public what CBDC is and where consumers can use it for, as knowledge on CBDC is positively related with the adoption and usage intensity of the CBDC current account and the adoption of the CBDC savings accounts. Third, central banks can steer usage intensity of CBDC savings accounts by varying the interest rate differential with the interest rate used for savings accounts by commercial banks. By setting a higher or lower interest rate they can steer the amount of money people hold in a CBDC savings account. We did not extensively study how usage intensity of CBDC savings accounts depends on the magnitude of the interest rate differential. More research may be needed to shed light on the precise influence of the interest rate differential e.g. under varying macro–economic conditions.

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Appendix A. Introductory text CBDC

Currently, you have access to:

1. cash: coins and banknotes issued by the central bank (public money/central bank money) and
2. digital money: the money you hold on your current and savings accounts at commercial banks, like ING, Rabobank, ASN bank and ABN AMRO (private money /commercial bank money).

Policymakers are considering whether citizens, like commercial banks, should be able to have an account with the central bank. There is no such possibility yet

Money on such an account is known as 'digital central bank money'. This is a new form of public money. We call it here a **digital banknote**. You will be able to pay with it in different ways, just like with the digital money you are currently holding at the current account of your bank. For example, you will be able to pay directly with digital banknotes for your purchases at physical shops using your debit card or smartphone.

It will also be possible to use digital banknotes to transfer money from your current account to a digital wallet on your smartphone, which you can subsequently use to pay your purchases with. When you run out of digital banknotes in this digital wallet, you can refill it.

Appendix B. Description of variables

Table B.1. Description of variables included in the regression analyses

Variable	Description	Mean	Sd	Min	Max	N
Dependent variables						
CBDC current account: adoption	Binary dummy capturing the intention to open a CBDC current account (1 = yes, 0 = no).	0.49	0.50	0	1	2,496
CBDC current account: intensity of use	Ordered variable capturing the amount of money on the CBDC current account in case *CBDC current account: adoption* = 1 (1 = EUR 0, 2 = EUR 1-100, 3 = EUR 101-500, 4 = EUR 501-1,000, 5 = EUR 1,001-3,000, 6 = more than EUR 3,000).	3.50	1.30	1	6	1,214
CBDC savings account: intensity of use	Ordered variable capturing the amount of money on the CBDC savings account (1 = EUR 0, 2 = EUR 1-5,000, 3 = EUR 5,001-10,000, 4 = EUR 10,001-20,000, 5 = EUR 20,001-30,000, 6 = EUR 30,001-39,999, 7 = EUR 40,000).	2.44	1.90	1	7	2,277
Explanatory variables						
Male	Binary dummy (1 = male, 0 = female).	0.52	0.50	0	1	2,496
34 and below	Binary dummy (1 = 34 and below, 0 = else). Reference category.	0.12	0.32	0	1	2,496
Between 35 and 44	Binary dummy (1 = between 35 and 44, 0 = else).	0.12	0.33	0	1	2,496
Between 45 and 54	Binary dummy (1 = between 45 and 54, 0 = else).	0.19	0.38	0	1	2,496
Between 55 and 64	Binary dummy (1 = between 55 and 64, 0 = else).	0.20	0.40	0	1	2,496
65 and over	Binary dummy (1 = 65 and over, 0 = else).	0.38	0.48	0	1	2,496
Education: bachelor or higher	Binary dummy (1 = higher vocational education or university education, 0 = else).	0.37	0.48	0	1	2,496
Income: ≤ EUR 1,150	Binary dummy (1 = household net monthly income ≤ EUR 1,150, 0 = else). Reference category.	0.08	0.28	0	1	2,496
Income: EUR 1,151-1,800	Binary dummy (1 = household net monthly income ≥ EUR 1,151 and ≤ EUR 1,800, 0 = else).	0.15	0.35	0	1	2,496
Income: EUR 1,801-2,600	Binary dummy (1 = household net monthly income ≥ EUR 1,801 and ≤ EUR 2,600, 0 = else).	0.22	0.42	0	1	2,496
Income: > EUR 2,600	Binary dummy (1 = household net monthly income > EUR 2,600, 0 = else).	0.54	0.50	0	1	2,496
Homeowner	Binary dummy (1 = homeowner, 0 = else).	0.71	0.45	0	1	2,496
Household head lives with partner	Binary dummy (1 = head of household is living together or married, 0 = else).	0.69	0.46	0	1	2,496
Degree of urbanization	Degree of urbanization of respondent's residence based on the address density per km^2 (1 = 500 or less, 2 = 500-1,000, 3 = 1,000-1500, 4 = 1,500-2,500, 5 = more than 2,500).	3.02	1.30	1	5	2,496
Region: west	Binary dummy (1 = living in the west of the Netherlands, 0 = else). Reference category.	0.41	0.49	0	1	2,496
Region: north	Binary dummy (1 = living in the north of the Netherlands, 0 = else).	0.12	0.32	0	1	2,496
Region: east	Binary dummy (1 = living in the east of the Netherlands, 0 = else).	0.23	0.42	0	1	2,496
Region: south	Binary dummy (1 = living in the south of the Netherlands, 0 = else).	0.24	0.43	0	1	2,496
Knowledge CBDC: no knowledge	Binary dummy (1 = has never heard of CBDC, 0 = else). Reference category.	0.54	0.50	0	1	2,496
Knowledge CBDC: low	Binary dummy (1 = has heard of CBDC but does not know what it is, 0 = else).	0.33	0.47	0	1	2,496
Knowledge CBDC: high	Binary dummy (1 = knows what is meant with CBDC, 0 = else).	0.13	0.13	0	1	2,496
Dissatisfied current account	Binary dummy indicating dissatisfaction with the main current account (1 = unsatisfied or very unsatisfied, 0 = else) else).	0.04	0.18	0	1	2,496
Dissatisfied savings account	Binary dummy indicating dissatisfaction with the main savings account (1 = unsatisfied or very unsatisfied, 0 = else) else).	0.11	0.31	0	1	2,277
Importance money protection CA	Ordered variable capturing the importance attached to protection of the money on the account against theft/fraud (1 = absolutely not important, 2 = unimportant, 3= neutral, 4 = important, 5 = very important)	4.62	0.58	2	5	2,496
Importance data protection	Ordered variable capturing the importance attached to the bank not sharing payments data with others (1 = absolutely not important, 2 = unimportant, 3= neutral, 4 = important, 5 = very important)	4.55	0.66	1	5	2,496
Importance privacy CA	Ordered variable capturing the importance attached to safeguarding privacy (1 = absolutely not important, 2 = unimportant, 3= neutral, 4 = important, 5 = very important)	4.54	0.64	1	5	2,496

Note: This table describes the variables used in the regressions of which the results are reported in Tables 3, 4 and 5. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions.

Table B.1. Description of variables included in the regression analyses (cont.)

Variable	Description	Mean	Sd	Min	Max	N
Importance money protection SA	Ordered variable capturing the importance attached to protection of the money on the account against theft/fraud (1 = absolutely not important, 2 = unimportant, 3= neutral, 4 = important, 5 = very important)	4.61	0.60	1	5	2,277
Importance privacy SA	Ordered variable capturing the importance attached to safeguarding privacy (1 = absolutely not important, 2 = unimportant, 3= neutral, 4 = important, 5 = very important)	4.55	0.64	1	5	2,277
Importance amount of money safeguarded against bankruptcy	Ordered variable capturing the importance attached to the amount of money people get back in case their bank goes bankrupt (1 = absolutely not important, 2 = unimportant, 3= neutral, 4 = important, 5 = very important)	4.48	0.72	1	5	2,277
Narrow-scope trust in banks	Ordered variable capturing trust in the own primary bank (1 = very little trust, 2 = little trust, 3 = sufficient trust, 4 = much trust, 5 = very much trust).	3.35	0.75	1	5	1,856
Broad-scope trust in banks	Ordered variable capturing trust in banks (1 = absolutely no trust, 2 = not so much trust, 3 = pretty much trust, 4 = a lot of trust).	2.54	0.67	1	4	1,856
Trust in the central bank	Ordered variable capturing trust in DNB (1 = absolutely no trust, 2 = not so much trust, 3 = pretty much trust, 4 = a lot of trust).	2.93	0.64	1	4	1,856
Generalized trust	Binary dummy (1 = in general most other people can be trusted, 0 = one cannot be careful enough in dealing with people).	0.64	0.48	0	1	1,856
Interest rate: same	Binary dummy (1 = sketched situation with the interest rate on the CBDC savings account the same as on the standard savings account, 0 = else). Reference category.	0.20	0.40	0	1	1,699
Interest rate: 0.25% lower	Binary dummy (1 = sketched situation with the interest rate on the CBDC savings account 0.25% lower than on the standard savings account, 0 = else).	0.20	0.40	0	1	1,699
Interest rate: 0.1% lower	Binary dummy (1 = sketched situation with the interest rate on the CBDC savings account 0.1% lower than on the standard savings account, 0 = else).	0.20	0.40	0	1	1,699
Interest rate: 0.1% higher	Binary dummy (1 = sketched situation with the interest rate on the CBDC savings account 0.1% higher than on the standard savings account, 0 = else).	0.20	0.40	0	1	1,699
Interest rate: 0.25% higher	Binary dummy (1 = sketched situation with the interest rate on the CBDC savings account 0.25% higher than on the standard savings account, 0 = else).	0.20	0.40	0	1	1,699

Note: This table describes the variables used in the regressions of which the results are reported in Tables 3, 4 and 5. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions.

Appendix C. Detailed tables

Table C.1. Why the public think it can be useful to introduce CBDC

	Reason	Share
1	A central bank does not have a profit target and does not have to make money from customers	35%
2	If the mainstream electronic retail payments system is not functional due to a disruption, citizens and businesses are still able to pay with digital banknotes	26%
3	CBDC is safer than cash	23%
4	CBDC make citizens and businesses less dependent on commercial banks. By doing so, there will still be public money for public use, as an alternative for coins and paper banknotes	23%
5	CBDC has a lower environmental footprint than cash money.	19%
6	Social costs of CBDC is lower than the social costs of cash	15%
7	CBDC can provide more privacy than money at commercial banks	13%
8	CBDC has a higher acceptance rate in other European countries than payment cards.	8%
9	By using CBDC citizens and businesses are able to transfer money to foreign current accounts faster than with the current means of payment.	8%
	None of these reasons	30%

Note: The number of respondents is 2,535. Respondents were asked to list up to three possible reasons why it may be useful to introduce digital euro banknotes that are most important to them.

Table C.2. Features at which CBDC current accounts should perform better than current accounts offered by commercial banks

Feature	Share
1. Protection of the money in your account against theft/fraud	31%
2. Privacy protection	23%
3. Interest rate received over positive balance	20%
4. Risk of losing your money in case of bankruptcy	19%
5. Not sharing data on your revenues and expenditures with other companies	17%
6. Fee payment package	17%
7. Few disruptions in online and mobile banking	11%
8. Low risk of not being able to pay due to disruptions at banks	11%
9. Ease of use payment app	10%
10. Online paying of bills is easy	10%
11. Good customer services in case of questions or problems	10%
12. Checking the balance on your account is easy	7%
13. Checking your revenues and expenses is easy	7%
14. Transferring money to other countries in Europe is easy	4%
15. Transferring money to family/friends is easy	4%
16. Transferring money to other countries outside Europe is easy	4%
17. Interest rate to be paid in case of overdraw	3%
18. Maximum positive balance on your account	2%
19. Another reason, namely…	1%
None of these reasons	19%

Note: The number of respondents is 2,525. This table reports the shares in the total number of answers of the 19 features at which a CBDC current account could perform better than the existing current accounts offered by banks. Respondents could choose at most three reasons.

Table C.3. Features at which CBDC savings accounts should perform better than current savings accounts offered by commercial banks

Feature	Share
1. Protection of your savings in your savings account against theft/fraud	35%
2. interest rate received over positive balance	34%
3. Privacy protection	26%
4. Amount of money that is guaranteed in case of bankruptcy	22%
5. Being able to safely store savings offline	19%
6. It is easy to transfer money to my current account	15%
7. Few disruptions in online and mobile banking	11%
8. Speed at which you can transfer money from your savings to your current account	11%
9. Good customer services in case of questions or problems	10%
10. Checking the balance in your savings account is easy	8%
11. Maximum balance on your account...	4%
12. Another reason, namely…	1%
None of these reasons	22%

Note: The number of respondents is 2,523. This table reports the shares in the total number of answers of the 12 features at which a CBDC savings account could perform better than the existing savings accounts offered by banks. Respondents could choose at most three reasons.

Appendix D. Robustness check

Table D.1. The intended intensity of usage of a CBDC savings account: only people who deposit money

	(1)	(2)	(3)	(4)
Male	0.26***	0.24***	0.27***	0.25***
	(0.06)	(0.06)	(0.07)	(0.08)
Between 35 and 44	0.07	0.07	0.06	0.14
	(0.12)	(0.12)	(0.12)	(0.17)
Between 45 and 54	0.06	0.10	0.12	0.03
	(0.10)	(0.11)	(0.11)	(0.15)
Between 55 and 64	0.08	0.06	0.06	0.03
	(0.10)	(0.11)	(0.11)	(0.14)
65 and over	-0.06	-0.06	-0.05	-0.07
	(0.09)	(0.10)	(0.10)	(0.13)
Education: bachelor or higher	0.23***	0.24***	0.21***	0.17**
	(0.07)	(0.07)	(0.07)	(0.09)
Income: EUR 1,151-1,800	0.01	0.06	0.02	-0.02
	(0.15)	(0.18)	(0.18)	(0.25)
Income: EUR 1,801-2,600	-0.07	0.05	-0.02	-0.11
	(0.15)	(0.17)	(0.17)	(0.23)
Income: > EUR 2,600	-0.17	-0.06	-0.11	-0.17
	(0.15)	(0.17)	(0.17)	(0.24)
Homeowner	-0.03	-0.04	-0.06	-0.06
	(0.08)	(0.09)	(0.09)	(0.11)
Household head lives with partner	0.17**	0.17**	0.17**	0.17*
	(0.08)	(0.08)	(0.09)	(0.10)
Degree of urbanization	-0.01	-0.02	-0.02	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Region: north	-0.07	-0.09	-0.09	0.01
	(0.10)	(0.11)	(0.11)	(0.13)
Region: east	0.02	-0.06	-0.05	-0.11
	(0.09)	(0.09)	(0.09)	(0.11)
Region: south	0.05	0.05	0.05	0.09
	(0.08)	(0.09)	(0.09)	(0.11)
Knowledge CBDC: low		-0.04	-0.02	-0.02
		(0.07)	(0.07)	(0.08)
Knowledge CBDC: high		0.05	0.04	-0.01
		(0.10)	(0.10)	(0.11)
Dissatisfied savings account		0.21*	0.18	0.11
		(0.12)	(0.12)	(0.15)
Importance_money protection SA		0.12	0.10	0.12
		(0.08)	(0.08)	(0.09)
Importance privacy SA		-0.11*	-0.09	-0.02
		(0.07)	(0.07)	(0.07)
Importance amount of money safeguarded against bankruptcy		-0.03	-0.03	-0.05
		(0.05)	(0.05)	(0.07)
Interest rate: 0.25% lower			-0.40***	-0.43***
			(0.11)	(0.14)
Interest rate: 0.1% lower			-0.22**	-0.26**
			(0.11)	(0.12)
Interest rate: 0.1% higher			0.24***	0.32***
			(0.09)	(0.11)
Interest rate: 0.25% higher			0.27***	0.27***
			(0.09)	(0.10)
Narrow-scope trust in banks				-0.09
				(0.07)
Broad-scope trust in banks				-0.07
				(0.07)
Trust in the central bank				0.08
				(0.08)
Generalized trust				-0.08
				(0.09)
Observations	1,227	1,136	1,136	815
Pseudo R2	0.01	0.01	0.03	0.03
Log pseudolikelihood	-2017.16	-1859.55	-1831.89	-1317.12
Wald χ^2	37.92***	46.07***	105.81***	86.27***

Note: The table reports parameter estimates of ordered probit regressions. Standard errors are clustered by household and shown in parentheses. The dependent variable captures the amount of money people would put on CBDC savings account if they would have EUR 40,000 to divide between a standard savings account and a CBDC savings account (2 = EUR 1-5,000, 3 = EUR 5,001-10,000, 4 = EUR 10,001-20,000, 5 = EUR 20,001-30,000, 6 = EUR 30,001-39,999, 7 = EUR 40,000). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level, respectively.

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