

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Economic Analysis and Policy

journal homepage: www.elsevier.com/locate/eap

Modelling Economic Policy Issues

Towards financial inclusion: Trust in banks' payment services among groups at risk

Marie-Claire Broekhoff^{a,b,*}, Carin van der Cruijssen^b, Jakob de Haan^{a,c}^a Faculty of Economics and Business, University of Groningen, Groningen, the Netherlands^b De Nederlandsche Bank, Amsterdam, the Netherlands^c CESifo, Munich, Germany

ARTICLE INFO

JEL classification:

D12
G21
O33

Keywords:

Trust in payment services
Customer groups at risk
Broad-scope trust
Narrow-scope trust
Digital literacy

ABSTRACT

Using unique payment diary survey data, this paper analyses trust in the Dutch payment system (broad-scope trust) and trust in the payment services of customers' own bank (narrow-scope trust) among several customer groups at risk of being financially excluded due to the ongoing digitalisation. We specifically research people who have low digital skills, face financial challenges, or have a disability. Our results suggest that respondents with low digital skills or those who experience financial difficulties have below-average levels of both broad-scope and narrow-scope trust. Among people who have difficulty walking or are wheelchair-bound we find a significant positive effect on broad-scope trust in the payment system, while blind or visually impaired people and people with limited or no hand function are less likely to have trust in the payment system compared to people who do not belong to one of these groups. Among those who fall in a group at risk due to a physical disability, we only uncover a significant negative effect on narrow-scope trust for people who are blind or with a visual impairment. Respondents with little broad-scope trust report various reasons for their lack of trust, such as dissatisfaction with banks' policies and the cost of bank services, interruptions in the payment system, and the ongoing digitalisation of payment services. Our findings underscore the importance of cultivating an accessible and inclusive payment system to increase financial inclusion from a trust-centred perspective.

1. Introduction

Banks are increasingly providing payment services in a digital form. Digitalisation of payment transactions combined with a reduction in traditional payment transactions has enabled banks to save costs, for example by culling bank branches and the associated staff. Furthermore, fewer cash payments often mean cost savings for retailers. Digitalisation also offers numerous advantages for many consumers. For instance, contactless payments, which have been enabled by advances in technology and the widespread use of smartphones, has grown as consumers consider them easier, more efficient, and safer than traditional means of payments. There is also evidence suggesting that these modern payment methods enhance financial inclusion (Demirgüç-Kunt et al., 2022; Avom et al., 2023).

We are grateful for the feedback given by Ron Berndsen, Maurice Bun, Sophie Cohen Tervaert and Jelmer Reijerink and an anonymous reviewer on earlier versions of this paper. The views expressed in this paper do not necessarily reflect the views of DNB or those of the Eurosystem.

* Corresponding author at: Faculty of Economics and Business, University of Groningen, Groningen, the Netherlands.

E-mail address: m.c.h.broekhoff@rug.nl (M.-C. Broekhoff).

<https://doi.org/10.1016/j.eap.2024.02.038>

Received 10 October 2023; Received in revised form 14 February 2024; Accepted 29 February 2024

Available online 1 March 2024

0313-5926/© 2024 Economic Society of Australia, Queensland. Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

This, in turn, may help alleviating poverty (Lee et al., 2023) and stimulate growth (Kim et al., 2018).

However, digitalisation may also lead to new issues for certain individuals as they can no longer participate (fully) autonomously in payment transactions and other daily financial services (Broekhoff et al., 2023). These so-called groups at risk are experiencing a decline in the ease of use, efficiency, reachability, and accessibility of certain payment services. There are several reasons for this. Individuals may not have the skills needed to use these new digital alternatives and may not understand their risks. Or they may have physical limitations (such as deafness or blindness) that hinder them, or do not own the necessary devices (such as computer, tablet and/or smartphone). In the Netherlands, most people have access to internet, but these numbers are lower for people aged 75 and older (Statistics Netherlands, 2023). Estimates by Broekhoff et al. (2023) suggest that around 2.6 million people in the Netherlands (i.e., around one in six adults) do not carry out their banking transactions and other financial business entirely independently. These groups are at risk of being financially excluded due to the digitalisation of the payment system.

This paper analyses whether trust in payment services of Dutch banks is lower among groups at risk compared to individuals who do not belong to one of these groups. Groups at risk studied include: (i) people with a disability; (ii) individuals with low digital skills; and (iii) people who face financial challenges. The primary dataset is the Survey on Consumers' Payments (SCP), which consists of payment diaries in which consumers register their daily payments and a supplementary survey. We use the latter part of the SCP for our analysis. The data were collected for De Nederlandsche Bank (DNB) and the Dutch Payment Association (DPA) in 2022 and the first half of 2023.

The notion of trust in financial services is important as consumers can assess a financial product only after it has been bought and often there is considerable time before the consumer can evaluate the performance of the financial service provider (Diacon and Ennew, 1996). When a financial service or product cannot be easily evaluated, trust plays an important role in consumers' purchase decisions (Ennew et al., 2011). This is true for investments and pension savings, but also holds for payment services. For instance, consumers have to trust their bank to actually transfer money after the consumer authorised the payment. Without trust in the banking industry, people become hesitant to use payment services even though they are essential to be able to take part in society.

Furthermore, trust in banks and their services is important because of financial stability concerns (van der Cruijssen et al., 2023). Low trust in the financial sector may undermine financial stability (Guiso, 2010). In the worst case, it may even lead to bank runs. At the same time, low trust may damage the financial services industry. If the industry is not trusted, consumers will choose to engage less, which, in turn, will damage both the industry and the economy by reducing the availability of capital for productive purposes (Jaffer et al., 2014; Devlin et al., 2015).

Trust is important for financial inclusion as well. Sarma and Pais (2011, p. 613) define financial inclusion as "a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy." An inclusive financial system can significantly improve daily finance management, reduce the growth of informal sources of credit and thereby enhance efficiency and welfare by providing secure and safe financial services (Sarma and Pais, 2011). The opposite is financial exclusion, which is defined by Leyson and Thrift (1995) as a process that prevents more vulnerable groups or individuals from accessing the formal financial system.

The digitalisation of the payment system poses a challenge for various individuals, such as those with low digital skills or individuals with disabilities. However, this does not have to compromise financial inclusion as long as the non-digital payment system continues to function well, and people are assisted in navigating the digital payment landscape. Effective assistance from the customer's bank can increase satisfaction with the bank's services and strengthen the bank-customer relationship. When customers have more interactions with their bank, they develop stronger trust in it merely because they are more familiar with it. This phenomenon is known as the mere-exposure effect (Zajonc, 1968). For example, focusing on Sweden, Hauff (2019) finds that the stronger the relationship with bank personnel is, the higher customers' trust in their bank. Customer-orientation is crucial for trust in banks (van Esterik-Plasmeijer and van Raaij, 2017). There is a positive relationship between the quality of the services offered by banks and consumers' trust in banks (Chang and Hung, 2018; Bravo et al., 2019; Phan and Ghantous, 2013; Carbó-Valverde et al., 2013). However, if the accessibility and availability of the payment system deteriorate, certain groups may become dissatisfied, leading to a lower level of trust among these groups.

It is important to gain knowledge about trust in the payment system among these groups at risk. Lack of trust may make people hesitant to adopt new technologies that have the potential to enhance financial inclusion. Several studies have analysed the role of trust in consumers' willingness to adopt and use mobile payments, which is generally considered as an innovation that stimulates financial inclusion. For instance, Chandra et al. (2010) and Xin et al. (2015) report that trust is an important driver of mobile payment adoption. Likewise, Duane et al. (2014) find that trust is one of the crucial factors for consumers' willingness to use mobile payments. However, what has been under-researched to date is to what extent lack of trust among certain groups at risk hampers the adoption of new digitalised payment devices among these groups, limiting their financial inclusion.

This study contributes to the literature as follows. First, to the best of our knowledge, trust in the payment system among groups at risk, has not been researched yet. By exploring a unique Dutch data set, we examine whether trust in the payment system differs between people who belong to these groups at risk and people who do not have to deal with these possible vulnerabilities. By doing so, we contribute to existing research on the relation between socio-demographic characteristics and trust in the payment system such as by Bijlsma et al. (2022). Second, this study contributes to the literature on financial inclusion. Research in this area has been developing over the last few years (see Ozili 2021 for an overview). Most research on financial inclusion focuses on emerging and developing countries, while our research examines financial inclusion in an advanced economy, exploring financial inclusion from a trust-centred view and focusing on vulnerable groups within society that are at risk of being financially excluded.

Our results suggest that respondents with low digital literacy and who face financial challenges have below-average levels of trust in the payment system (broad-scope trust) and in payment services of customers' own bank (narrow-scope trust). Among people who experience difficulty walking or are wheel-chair bound, we find a significant positive effect on broad-scope trust in the payment system

in general, while blind or visually impaired people and people with limited or no hand function have below-average levels of trust in the payment system. Among the groups at risk due to a physical disability, we only uncover a significant negative effect on narrow-scope trust for people who are blind or visually impaired. Our qualitative analysis suggests that the cause of low broad-scope trust is often related to low trust in banks’ policies and the costs associated with bank services, the number of interruptions in the payment system, and the ongoing digitalisation of payment services in the Netherlands.

The remainder of the paper is organised as follows. Section 2 provides background information on digitisation, presents our hypotheses, and discusses related studies. Section 3 discusses the data and Section 4 presents our results. Section 5 includes the sensitivity analysis and we present the conclusion and policy implications in Section 6.

2. Background, hypotheses, and related literature on trust in banks

2.1. Background

Financial service providers often make new digital services available alongside traditional services (Broekhoff et al., 2023). If these new digital means of providing services become popular, banks discourage traditional services by limiting their use or introducing fees for using them. This digitalisation has a huge impact on how consumers use payment services. For instance, it is increasingly more common to perform basic payment services online or remotely. As a consequence, traditional basic payment services – such as cash, paper transfer forms and direct debit authorisations, or help from bank employees at the bank branch – are becoming less common or are even disappearing altogether. Rowe et al. (2014) conclude that vulnerable consumers experience that new financial services, products and systems aimed at improving services are not designed for people with ‘non-standard’ needs, even when these non-standard needs are relatively common within certain groups. Some consumers try to adapt in order to make these products or services work for them to some extent, but not everyone is able to do so and these people are therefore at risk of being excluded from mainstream financial services altogether. In other words, financial inclusion – defined as a situation where households have access to useful and affordable financial services that meet their needs – drops. These financial services include payments and transaction accounts, but also savings, credit and insurance (World Bank, 2023; Grable et al., 2023).

Fig. 1, reproduced from Broekhoff et al. (2023), shows the gross and net size of various groups facing difficulties participating in the digitalised payment system in the Netherlands. The gross size includes the total number of adults belonging to a particular group, while the net size is the size of the group after adjustment for double counting. By far the largest group comprises people who have a low level of education: 4.1 million people in the Netherlands over the age of 18 fall into this group, which accounts for 29% of all Dutch citizens aged 18 and over in 2022. However, many of them also fall into at least one of the other groups. The groups aged 65 to 74 years and 75 years or older are also relatively large: their gross sizes are almost 2 million and over 1.5 million people, respectively. It is well-established in the literature that older and less-educated individuals are more likely to favour cash payments compared to other groups (Arango-Arango et al., 2018; Bagnall et al., 2016; van der Crujnsen and Plooij, 2018; van der Crujnsen and Reijerink, 2023).

Another group at risk, which is not included in Fig. 1, are people who experience difficulties making ends meet. In 2022, 10% of the Dutch population found it hard or very hard to get by DNB and DPA (2023). People in this group make more use of cash payments compared to people who do not face financial challenges (van der Crujnsen and Reijerink, 2023).

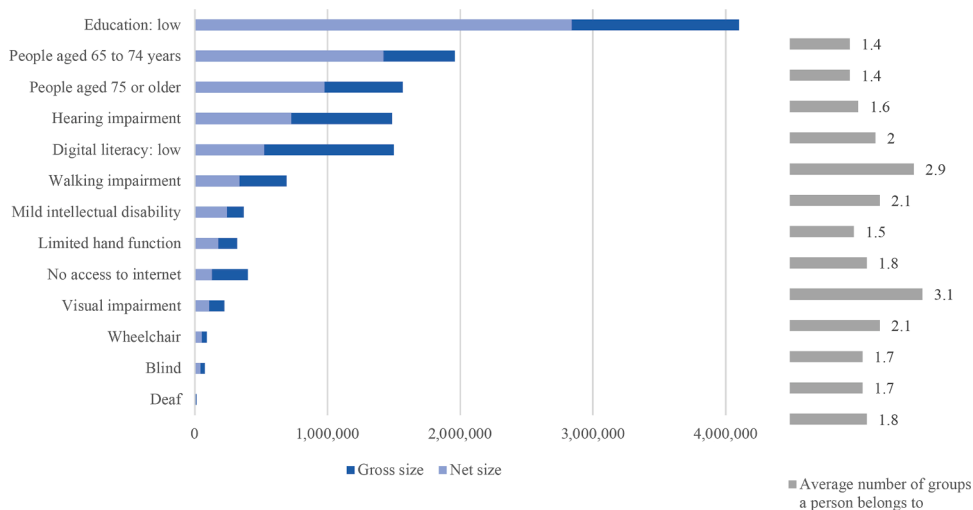


Fig. 1. Size of various groups facing difficulties participating in the digitalised payment system. Source: Broekhoff et al. (2023).

2.2. Hypotheses

Our first hypothesis posits that individuals who encounter challenges to independently engage in the digitalised payment system, exhibit lower levels of trust in these services compared to people who do not encounter these difficulties. The physical character of cash helps people in certain groups at risk to conduct payment transactions autonomously (Spaanderman, 2020). Furthermore, individuals who have difficulties making ends meet often use cash to manage the allocation of their monthly or weekly spendings (Hernandez et al., 2017; Broekhoff and van der Crujisen, 2022; van der Crujisen and Reijerink, 2023). Von Kalckreuth et al. (2014) stress the importance of cash (specifically in Germany) for people with a lower income. Cash helps to control impulse purchases, which makes it easier for individuals to keep to their budgets and thereby prevent financial challenges. Likewise, the UK Access to Cash Review (2019) indicates that since financially vulnerable people have limited access to the digital infrastructure and are more dependent on cash, they risk having to pay more for alternatives. Additionally, they cannot always take advantage of discounts in online shops or compare prices of goods, which means they are more likely to spend more money than necessary. As the use of cash payments has been made more difficult by banks, our second hypothesis is therefore that individuals facing financial challenges exhibit lower levels of trust in payment services than people who do not face these difficulties.

2.3. Literature on trust in banks

Trust in banks has been studied quite extensively. Often a distinction is made between broad- and narrow-scope trust. Hansen (2012, p. 282) defines broad-scope trust as: “the expectation held by the consumer that companies within a certain business type are generally dependable and can be relied on to deliver on their promises.” Narrow-scope trust can be defined as “the expectation held by the consumer that the service provider (for instance a bank) is dependable and can be relied on to deliver on its promises” (Sirdeshmukh et al., 2002, p. 17). It is important to distinguish between both types of trust, as previous literature suggests that many customers seem to believe that their own bank is an exception to the rule that banks cannot be trusted (van Esterik-Plasmeijer and van Raaij, 2017). As pointed out by van Esterik-Plasmeijer and van Raaij (2017), customers are likely to have deliberately selected their bank based on their preferences and comparisons with other banks. After this selection, customers are arguably biased and rate their bank as more trustworthy than other banks. In line with this finding, previous studies generally find that narrow-scope trust is higher than broad-scope trust. Furthermore, they often report a positive relationship between both types of trust. Van Esterik-Plasmeijer and van Raaij (2017) and van der Crujisen et al. (2021) show a significant positive association between broad- and narrow-scope trust for banks in the Netherlands, and Filipiak (2016) does so for Indian banks. Moreover, Moden et al. (2021) find that narrow-scope trust is higher for traditional banks compared to neo-banks or other fintech companies. Customers state that their trust in traditional banks is reinforced by the idea that data protection is better and that there is a bank branch nearby. However, digitalisation is causing a rapid decline in the number of bank branches, which could lead to a decrease in trust in the future. The most important reasons for consumers to trust neo-banks and other fintech companies is because they offer better and more innovative products (Moden et al., 2021).

The results of studies examining the relationship between personal characteristics and trust in banks are mixed (see van der Crujisen et al. 2023 for a review of the literature). Several studies find that income is positively related to trust in banks (Fungáčová et al., 2019; Ampudia and Palligkinis, 2018), but other studies report no significant income effect (Fungáčová & Weill, 2018). Outcomes on the relationship between age and trust in banks are also mixed. While Ennew and Sekhon (2007) observe the highest level of public trust in banks for their oldest sub-group of UK respondents, Afandi and Habibov (2017) report that trust in banks in transitional countries is higher for young people. The effect of education on trust is also not clear-cut. Fungáčová and Weill (2018) conclude that having a higher education level is negatively related to public trust in Chinese banks, but Afandi and Habibov (2017) find that higher educated individuals have more trust in banks compared to lower educated people. Finally, financial literacy seems positively related to public trust in Dutch banks (van der Crujisen et al., 2021).

3. Data and methodology

3.1. Data

This study uses the SCP. The data are collected by Ipsos for DNB and theDPA. The survey sample is representative for the Dutch population aged 12 years and older based on four demographic aspects: gender, age, ethnicity, and education. SCP data have been used in previous studies to research consumer payment behaviour (see, for example, Jonker et al., 2017; van der Crujisen et al., 2017; van der Crujisen and Knoben, 2021; Jonker et al., 2022). The SCP consists of a payment diary and a supplementary survey. We use the latter part, which includes information on trust in banks’ payment services and socio-economic and demographic information on respondents, for our analysis. This research examines data from 1 January 2022 until 30 June 2023. Since January 2022, additional questions have been incorporated in the survey to cover a broader demographic spectrum and to identify groups at risk such as people with a physical or mental impairment.

In total, the data set contains 33,169 observations (out of which 2% participated by phone and 98% online) consisting of 23,967 unique respondents. Ipsos has a group of panel members without internet access who can be contacted in writing and/or by phone for research purposes. A sample is drawn from this group every quarter and contacted by phone. By allowing respondents to participate by phone, the selection bias for people with low digital literacy is limited to some extent, but it is still possible that this group is underrepresented in the sample. A person can fill in the survey at most once each quarter. On average, respondents participated in the survey 1.4 times. 27% of the respondents filled in the survey twice or more. In our sensitivity analysis, we check whether our results

hold when we run the models with only the first observation for each respondent.

3.2. Dependent variables

For the regression analyses, we use two dependent variables to measure consumers trust in banks' payment services: broad- and narrow-scope trust. We have chosen to research both broad-scope and narrow-scope trust in the payment system. A distinction between broad-scope and narrow-scope trust is made in the literature related to trust in banks (van Esterik-Plasmeijer and van Raaij, 2017; van der Crujjsen et al., 2021), trust in financial services (Hansen, 2012) and trust in banks' payment services (Bijlsma et al., 2022).

In the questionnaire, respondents first see the question on narrow-scope trust and thereafter a question on broad-scope trust. As narrow-scope trust is related to the consumer's own bank, the question includes the name of the bank where the respondent currently has an account. If respondents arrange their banking affairs at two or more banks, they are asked to answer the narrow-scope trust question for one of these banks. The selection of the bank is made at random based on the banks mentioned by the respondent, except when the respondent is a customer of a smaller bank. In such instances, the narrow-scope trust question pertains either to the specific bank in question or, if the respondent holds accounts with multiple smaller banks, to one of these smaller banks selected through a random process. This approach ensures that enough responses are generated for smaller banks. Trust is measured on a five-point scale, where the fifth category implies the highest level of trust. The trust questions asked in the survey are listed in Table A.1 in Appendix A and the summary statistics are shown in Table B.1 in Appendix B.

Fig. 2 shows the levels of broad- and narrow-scope trust for our sample. The figure suggests that respondents generally have more trust in their own banks' payment services than the Dutch payment system in general. Overall, 73% trust the Dutch payment system in general, whereas 92% trust their own bank to process payments adequately. Our finding of higher broad-scope compared to narrow-scope trust is consistent with the results of previous studies (van der Crujjsen et al., 2023; van Esterik-Plasmeijer and van Raaij, 2017).

3.3. Explanatory variables

In our empirical analysis, we include numerous variables to learn more about the trust in the payment system experienced by groups at risk. This section describes the explanatory variables. For descriptive statistics of each variable, we refer to Table B.2 and B.3 in Appendix B.

3.3.1. Groups at risk

Broekhoff et al. (2023) highlight the importance of researching groups at risk within payments as these groups are less likely to find the payment system easily accessible. This is partly caused by the ongoing digitalisation and makes them at risk of becoming excluded from the financial system, not only in the Netherlands, but also in other countries such as Sweden (Riksbank, 2022). In line with van der Crujjsen and Reijerink (2023), who researched the importance for cash among groups at risk in the Netherlands, we research three groups at risk: people with physical or mild intellectual disabilities, people with low digital literacy, and people who experience financial difficulties.

The first group at risk consists of people with physical or mild intellectual disabilities. The 2022 and 2023 SCP questionnaires include a question aimed at measuring whether respondents have certain disabilities. We employ the collected responses to construct five binary variables: *difficulty walking or wheelchair-bound*, *deaf or hearing impaired*, *blind or visually impaired*, *limited or no hand function*, and *mild intellectual disability*. These variables are assigned a value of 1 if the respondent belongs to that group, and the value 0 otherwise. An individual can belong to more than one group. The sizes of these groups differ. For example, in our sample the largest group is people experiencing issues with walking or need to use a wheelchair (5.5%), while only 0.05% of the sample states that they have a mild intellectual disability. For more information about the sample size of each group, we refer to Appendix B (Table B.2).

The second group comprises individuals with low self-reported digital literacy. In the SCP, respondents are asked to list their level of digital skills on a scale of 1 'not skilled at all' to 10 'very digitally skilled'. The survey explains that these digital skills include using a computer or smartphone, and using the internet. On average, respondents rate themselves a 7.9 out of 10. We construct a binary variable *digital literacy: low*, which takes value 1 for respondents who rate their skills 5 or lower and 0 for respondents who rate themselves a 6 or higher. 4.3% of the respondents have low self-reported digital literacy.

The last group consists of people who experience financial difficulties. We proxy this by using the question that asks how difficult people find it to make ends meet on their income. This is self-reported on a five-point scale ('very easy', 'easy', 'neither hard, nor easy', 'hard', and 'very hard'). For each category a dummy variable is created. The base category is *difficulties making ends meet: very easy*. Most respondents find it easy (39.8%), neither hard, nor easy (37.7%) or very easy (13.5%) to get by on their income, while others find it hard (7.3%) or very hard (1.6%).

Table 1 shows the tetrachoric correlation between the different groups at risk variables. This type of correlation is used to calculate the correlation between binary variables. Most correlations are significant and positive. The highest correlations are observed among certain disabilities, possibly because elderly people are more likely to have a combination of disabilities, such as both hearing and visual impairments. The highest correlation is found between *blind or visually impaired* and *deaf or hearing impaired* (0.545) and *limited or no hand function* and *difficulty walking or wheelchair-bound* (0.580).

3.3.2. Control variables

In addition to the explanatory variables capturing the groups at risk, we include various control variables. These variables can be

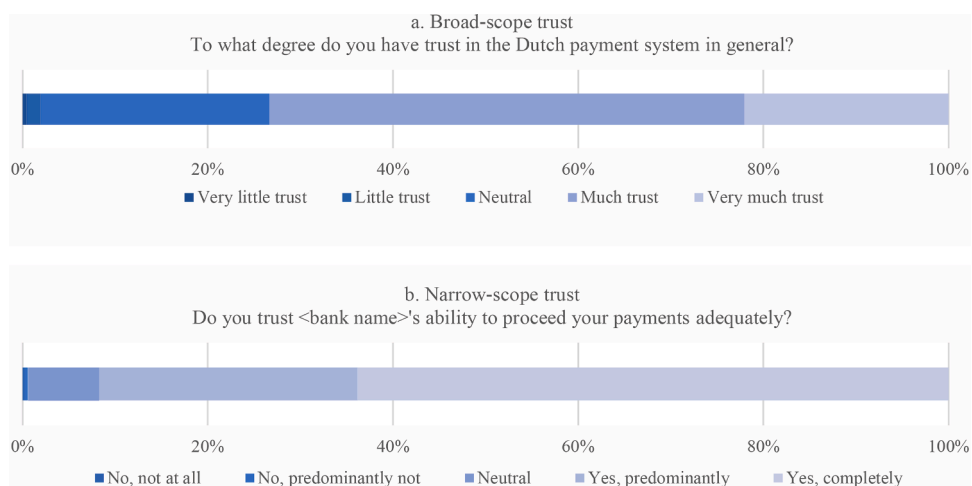


Fig. 2. Broad-scope and narrow-scope trust in the sample (% of respondents).

Source: SCP, January 1, 2022–June 30, 2023. Note: 33,169 observations.

Table 1

Correlations between groups at risk.

| | Difficulty walking or wheelchair-bound | Deaf or hearing impaired | Blind or visually impaired | Limited or no hand function | Mild intellectual disability | Digital literacy: low |
|--|--|--------------------------|----------------------------|-----------------------------|------------------------------|-----------------------|
| Difficulty walking or wheelchair-bound | 1.000 | | | | | |
| Deaf or hearing impaired | 0.437*** | 1.000 | | | | |
| Blind or visually impaired | 0.398*** | 0.545*** | 1.000 | | | |
| Limited or no hand function | 0.580*** | 0.286*** | 0.338*** | 1.000 | | |
| Mild intellectual disability | 0.070 | -0.016 | 0.259*** | 0.130** | 1.000 | |
| Digital literacy: low | 0.264*** | 0.217*** | 0.284*** | 0.239*** | 0.303*** | 1.000 |
| Difficulties making ends meet: hard | 0.204*** | 0.01 | 0.107*** | 0.237*** | 0.141*** | 0.219*** |
| Difficulties making ends meet: very hard | 0.257*** | 0.025 | 0.234*** | 0.236*** | 0.300*** | 0.238*** |

Note: ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The correlation between the categories of difficulties making ends meet are omitted as these variables are mutually exclusive, implying that the correlation is -1.000***.

divided into four categories: (1) personal characteristics, (2) satisfaction and payment preferences, (3) financial products, and (4) variables to control for time effects. All variables that are described in this Section are dummies, unless mentioned otherwise. A more detailed description including descriptive statistics is presented in Table B.3 in Appendix B.

The first set of control variables refers to standard personal characteristics and whether the respondent is a customer of a large bank.¹ Bijlsma et al. (2022) conclude that personal characteristics are significantly related to trust in banks' payment services and many studies on trust in banks have shown that trust in banks relates to socio demographics (van der Cruijssen et al., 2023). We include a wide range of individual characteristics to further examine what type of effect these variables may have on trust in the payment system. Moreover, whether respondents are a customer at a small or large bank makes a significant difference according to Bijlsma et al. (2022). As trust in the payment system in general (broad-scope) can influence narrow-scope trust, we include the broad-scope variable in the regressions where narrow-scope trust is the dependent variable (Bijlsma et al., 2022).

The gender of the respondent is captured by the variable *male*, which takes the value 1 if the respondent is male and 0 for a female respondent. The variable *partner* is equal to 1 if the respondent lives with a partner or is married (with or without children) and 0 otherwise. Then, we include a range of variables to control for respondents' age, as it is expected that trust may differ among different age groups. The reference category is *12 to 24 years*, which takes value 1 if a respondent is between 12 and 24 years old. The other six age variables are created in a similar way. *Education: low* is 1 if the respondent has a low education level and 0 otherwise. To control for

¹ The Dutch banking sector is highly concentrated. In the second half of 2022, the five largest domestic banks accounted for about 82% of total assets of the banking sector (DNB, 2023a). Prior to the global financial crisis, the size of the Dutch banking sector increased. Since the crisis, the total size of the banking sector has shrunk and coming close to 110% of GDP as of end-2020, which is still large compared to other OECD countries (source: World Bank).

gross yearly household income, we include three variables: *income: low* (less than or equal to €23,400), *income: middle* (between €23,401 and €65,000) and *income: unknown*. The reference category comprises individuals with an income of at least €65,001. Moreover, dummies are included to control for the level of *urbanism* in the respondent's place of residence. The base category is *very urban*. The other categories are *urban*, *moderately urban*, *rural* and *very rural*. Finally, we consider whether the respondent has a migration background. There are four categories based on first- and second-generation and Western and non-Western backgrounds. Persons are considered to be first-generation migrants if they were born outside the Netherlands and second-generation migrants if at least one of their parents was born outside of the Netherlands. This leads to four dummy variables to capture *migration background*. The categories are *Western first-generation*, *Western second-generation*, *non-Western first-generation*, and *non-Western second-generation*, each taking the value 1 if applicable to the respective respondent. Furthermore, we control for which bank the respondent answered the narrow-scope trust question through the control variable *large bank* which is equal to 1 if the respondent answered the question about one of the three major banks in the Netherlands (ING, Rabobank or ABN AMRO) and 0 otherwise. It holds for 82.5% of the observations that the respondent is customer of a large bank.

The second set of control variables capture satisfaction and payment preferences. We include satisfaction with the conduct of payments because prior studies have shown a positive link between the quality of services offered by banks and consumers' trust in banks (Chang and Hung, 2018; Bravo et al., 2019; Phan and Ghantous, 2013; Carbó-Valverde et al., 2013). Trust may also be related to payment preferences as the impact of the digitalisation of the payment world and changes in the accessibility and availability of the non-digital world is likely to depend on these preferences.

Respondents are asked to rate their satisfaction with how they conducted their payments both on the day they fill out the survey and in general. We use the latter question to construct the continuous variable *satisfaction*, with values 1 'very unsatisfied', 2 'unsatisfied', 3 'sufficient', 4 'satisfied' or 5 'very satisfied'. Overall, most respondents are satisfied (54.1%) or very satisfied (27.9%). In addition, we control for preferred payment method. The four payment instruments that are used most at the point of sale (POS) in the Netherlands are cash, debit card traditional, debit card contactless, and contactless with mobile phone or other wearable. Credit cards only account for about 0.5% of all POS payments (DNB and DPA, 2023). The base category is *preferred payment method: cash*, which is equal to 1 if the respondent listed cash as preferred payment method. For the other three categories (*debit card traditional*, *debit card contactless* and *contactless with mobile phone or other wearable*), dummy variables are constructed in a similar way. The fifth category *PIN, no preference* takes the value 1 if the person prefers one of the three PIN methods but does not have a particular preference for one of them.

Third, we introduce variables that serve as proxies for the bank-customer relationship. Dummy variables are added to incorporate whether the respondent uses certain financial products or services (*mortgage, personal loan, savings, online banking, pension, investment*). Increased interactions with a bank lead to the development of stronger trust simply due to heightened familiarity, a phenomenon referred to as the mere-exposure effect (Zajonc, 1968). Hauff (2019) reveals that a stronger relationship with bank personnel correlates with higher levels of trust. Among the financial products or services considered, savings emerge as the most popular product, with 84.4% of the respondents indicating having a savings account and 53.3% saving for their pension or having life insurance.² Furthermore, 21.3% of the respondents have investments (stocks, investment funds, bonds, or similar investment products). 83.4% of the respondents use online banking. Approximately half of the respondents hold a mortgage, while 5.5% have taken out a personal loan.

Finally, we control for month of the year effects (base category: *January*) and day of the week effects (base category: *Monday*). It is common to control for time effects in payment behaviour research, because of the time patterns in payment choice (e.g. Wang and Wolman 2016, van der Crujnsen and Knobens 2021). As trust in the payment system is likely to depend on payment behaviour, we include variables to control for time effects. In our robustness analysis we use different methods to control for time effects.

3.4. Model

To gain insights into the drivers of public trust in banks' payment services we estimate ordered logistic regressions as the dependent trust variables are ordered variables that can take on a limited number of values. More precisely, the trust variables are measured on a scale of 1 to 5. For broad-scope trust, 1 represents very little trust and 5 very high trust, whereas for narrow-scope trust, 1 means no trust at all and a score of 5 represents complete trust. The model is as follows:

$$Trust_i = f(X_i, Z_i) + e_i \quad (1)$$

The model is used for two different dependent variables. The dependent variable $Trust_i$ is either broad-scope trust or narrow-scope trust for individual i . The vector X_i includes variables reflecting whether a respondent belongs to various groups at risk, while Z_i captures other personal characteristics, and e_i is the idiosyncratic error. The vector Z_i is nearly the same for both types of trust, with the exception that the variable broad-scope trust is also considered as an explanatory variable in the model for narrow-scope trust.

3.5. Qualitative text analysis

In addition to the regression analysis, we explore the open-ended question on trust in the SCP through a qualitative text analysis.

² Life insurance was only included in the 2022 version of the SCP.

Table 2
Broad-scope and narrow-scope trust: regression results.

| | Broad-scope trust | | | | Narrow-scope trust | | | |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Male | 0.42*** (0.026) | 0.40*** (0.026) | 0.42*** (0.026) | 0.41*** (0.026) | -0.23*** (0.030) | -0.24*** (0.030) | -0.22*** (0.030) | -0.20*** (0.030) |
| Partner | 0.00 (0.029) | 0.02 (0.029) | 0.02 (0.029) | 0.02 (0.030) | -0.07** (0.034) | -0.06* (0.034) | -0.06* (0.034) | -0.06* (0.035) |
| Age (reference category: 12 to 24 years) | | | | | | | | |
| 25 to 34 years | -0.05 (0.061) | -0.04 (0.061) | -0.01 (0.060) | -0.06 (0.062) | 0.24*** (0.071) | 0.24*** (0.071) | 0.26*** (0.071) | 0.25*** (0.073) |
| 35 to 44 years | -0.01 (0.053) | 0.03 (0.053) | 0.09* (0.053) | 0.03 (0.056) | 0.10* (0.061) | 0.12* (0.061) | 0.15** (0.061) | 0.13** (0.064) |
| 45 to 54 years | -0.06 (0.050) | 0.01 (0.050) | 0.08 (0.049) | 0.00 (0.052) | -0.04 (0.056) | -0.01 (0.056) | 0.02 (0.056) | 0.01 (0.060) |
| 55 to 64 years | -0.08 (0.049) | -0.04 (0.049) | 0.02 (0.048) | -0.05 (0.051) | 0.06 (0.056) | 0.07 (0.056) | 0.11* (0.056) | 0.10* (0.059) |
| 65 to 74 years | -0.10** (0.051) | -0.13** (0.051) | -0.07 (0.051) | -0.13** (0.053) | 0.21*** (0.060) | 0.21*** (0.060) | 0.25*** (0.061) | 0.24*** (0.063) |
| 75 years or older | -0.16*** (0.055) | -0.16*** (0.057) | -0.10* (0.057) | -0.15*** (0.058) | 0.32*** (0.068) | 0.34*** (0.070) | 0.38*** (0.070) | 0.39*** (0.072) |
| Education: low | -0.43*** (0.026) | -0.32*** (0.027) | -0.23*** (0.026) | -0.20*** (0.027) | 0.24*** (0.030) | 0.27*** (0.030) | 0.30*** (0.031) | 0.28*** (0.031) |
| Income (reference category: high) | | | | | | | | |
| Low | -0.83*** (0.050) | -0.26*** (0.053) | -0.12** (0.052) | -0.07 (0.053) | 0.02 (0.056) | 0.18*** (0.059) | 0.22*** (0.059) | 0.20*** (0.061) |
| Middle | -0.45*** (0.035) | -0.17*** (0.036) | -0.11*** (0.035) | -0.09*** (0.036) | 0.01 (0.040) | 0.10** (0.041) | 0.11*** (0.041) | 0.09** (0.042) |
| Unknown | -0.95*** (0.040) | -0.65*** (0.041) | -0.48*** (0.040) | -0.45*** (0.041) | -0.09** (0.044) | 0.00 (0.045) | 0.04 (0.046) | 0.03 (0.046) |
| Urbanism (reference category: very urban) | | | | | | | | |
| Urban | -0.02 (0.036) | -0.02 (0.035) | -0.06* (0.034) | -0.06* (0.034) | 0.07* (0.040) | 0.06 (0.040) | 0.05 (0.040) | 0.05 (0.040) |
| Moderately urban | 0.00 (0.042) | -0.01 (0.042) | -0.03 (0.041) | -0.03 (0.041) | 0.12** (0.048) | 0.11** (0.048) | 0.10** (0.048) | 0.10** (0.048) |
| Rural | -0.09** (0.040) | -0.11*** (0.040) | -0.10** (0.039) | -0.10** (0.039) | 0.15*** (0.046) | 0.14*** (0.046) | 0.14*** (0.046) | 0.14*** (0.046) |
| Very rural | -0.22*** (0.053) | -0.21*** (0.052) | -0.18*** (0.052) | -0.18*** (0.052) | 0.07 (0.061) | 0.07 (0.061) | 0.08 (0.061) | 0.08 (0.061) |
| Migration background | | | | | | | | |
| Western first-generation | -0.10 (0.085) | -0.02 (0.086) | 0.00 (0.085) | 0.00 (0.085) | -0.15* (0.086) | -0.14 (0.086) | 0.13 (0.084) | -0.13 (0.084) |
| Western second-generation | -0.01 (0.049) | -0.01 (0.049) | -0.04 (0.048) | -0.04 (0.048) | -0.12** (0.052) | -0.13** (0.052) | -0.14*** (0.052) | -0.14*** (0.052) |
| Non-Western first-generation | -0.15* (0.083) | -0.14 (0.086) | -0.01 (0.084) | 0.01 (0.085) | -0.30*** (0.091) | -0.30*** (0.092) | -0.25*** (0.091) | -0.26*** (0.091) |
| Non-Western second-generation | -0.21*** (0.081) | -0.16** (0.080) | -0.09 (0.076) | -0.08 (0.076) | -0.40*** (0.080) | -0.39*** (0.080) | -0.36*** (0.081) | -0.37*** (0.081) |
| Large bank | 0.13*** (0.032) | 0.14*** (0.032) | 0.12*** (0.032) | 0.12*** (0.032) | -0.71*** (0.044) | -0.71*** (0.044) | -0.72*** (0.044) | -0.72*** (0.044) |
| Broad-scope trust | | | | | 1.92*** (0.025) | 1.88*** (0.025) | 1.74*** (0.025) | 1.74*** (0.025) |
| Physical or mental disability | | | | | | | | |
| Difficulty walking or wheelchair-bound | | 0.11* (0.058) | 0.15*** (0.059) | 0.16*** (0.059) | | 0.08 (0.071) | 0.10 (0.071) | 0.09 (0.071) |
| Deaf or hearing impaired | | -0.02 (0.053) | -0.10* (0.053) | -0.10* (0.053) | | -0.03 (0.067) | -0.05 (0.067) | -0.05 (0.067) |
| Blind or visually impaired | | -0.28*** (0.084) | -0.26*** (0.085) | -0.26*** (0.085) | | -0.42*** (0.101) | -0.43*** (0.102) | -0.43*** (0.102) |
| Limited or no hand function | | -0.34*** (0.083) | -0.20*** (0.083) | -0.21** (0.084) | | -0.06 (0.103) | -0.02 (0.104) | -0.02 (0.105) |
| Mild intellectual disability | | -0.14 (0.210) | -0.05 (0.207) | -0.04 (0.209) | | 0.21 (0.215) | 0.24 (0.212) | 0.25 (0.212) |
| Digital literacy: low | | -0.66*** (0.066) | -0.35*** (0.064) | -0.33*** (0.065) | | -0.26*** (0.071) | -0.18** (0.071) | -0.16** (0.072) |
| Difficulties making ends meet (reference category: very easy) | | | | | | | | |
| Easy | | -0.73*** (0.038) | -0.47*** (0.039) | -0.47*** (0.039) | | -0.24*** (0.050) | -0.17*** (0.050) | -0.19*** (0.050) |
| Neither hard, nor easy | | -1.28*** (0.042) | -0.83*** (0.044) | -0.82*** (0.044) | | -0.43*** (0.053) | -0.31*** (0.053) | -0.34*** (0.053) |
| Hard | | -1.40*** (0.042) | -0.83*** (0.044) | -0.82*** (0.044) | | -0.42*** (0.053) | -0.25*** (0.053) | -0.29*** (0.053) |

(continued on next page)

Table 2 (continued)

| | Broad-scope trust | | | | Narrow-scope trust | | | |
|--|-------------------|--------------------------------|--------------------------------|--------------------------------|--------------------|--------------------------------|-----------------------------|-----------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Very hard | | (0.063) -1.76*** (0.139) | (0.063) -1.05*** (0.138) | (0.063) -1.04*** (0.138) | | (0.071) -0.34*** (0.130) | (0.072) -0.12 (0.130) | (0.073) -0.17 (0.131) |
| Satisfaction | | | 1.07*** (0.028) | 1.07*** (0.028) | | | 0.39*** (0.019) | 0.39*** (0.019) |
| Preferred payment method (<i>reference category: cash</i>) | | | | | | | | |
| Debit card traditional | | | 0.58*** (0.045) | 0.58*** (0.045) | | | 0.14*** (0.050) | 0.13*** (0.050) |
| Debit card contactless | | | 0.71*** (0.036) | 0.70*** (0.036) | | | 0.25*** (0.038) | 0.24*** (0.038) |
| Contactless by mobile phone or wearable | | | 0.95*** (0.046) | 0.93*** (0.046) | | | 0.26*** (0.051) | 0.26*** (0.051) |
| PIN, no preference | | | 0.44*** (0.066) | 0.43*** (0.066) | | | -0.03 (0.078) | -0.04 (0.077) |
| Mortgage | | | | 0.01 (0.029) | | | | 0.00 (0.033) |
| Personal loan | | | | 0.17*** (0.056) | | | | 0.18*** (0.063) |
| Savings | | | | 0.01 (0.038) | | | | -0.03 (0.044) |
| Online banking | | | | 0.08** (0.036) | | | | 0.11*** (0.042) |
| Pension | | | | 0.07** (0.026) | | | | -0.02 (0.032) |
| Investment | | | | 0.11*** (0.032) | | | | -0.16*** (0.037) |
| Month effects | yes | yes | yes | yes | yes | yes | yes | yes |
| Weekday effects | yes | yes | yes | yes | yes | yes | yes | yes |
| Observations | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 |
| Individuals | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 |
| Wald χ^2 | 1808.9*** | 2974.2*** | 5433.4*** | 5472.8*** | 6513.9*** | 6645.0*** | 6923.4*** | 6990.5*** |
| Pseudo R ² | 0.036 | 0.059 | 0.133 | 0.134 | 0.191 | 0.194 | 0.203 | 0.204 |

Note: The table reports parameter estimates of ordered logit models. Standard errors are clustered by individual and shown in parentheses. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively.

The open-ended question is a follow-up question and only presented to respondents who answer ‘very little trust’ or ‘little trust’ in the broad-scope trust question. The objective of this part of the study is to obtain additional perspectives as to why respondents have little trust in the payment system in general.

In the sample, 290 respondents answered the open-ended question. After removing observations that did not contain any insightful information (e.g., ‘I don’t know’ or that were left empty), 254 observations are included in the analysis. We manually extract the most important key words related to the respondents’ answer. Based on these key words, we assess how often each key word is mentioned and which combinations are common.

4. Empirical results

Table 2 shows the regression results for broad-scope trust (trust in the Dutch payment system) and narrow-scope trust (trust in own bank’s ability to conduct payments). We present four models for both types of trust. Each model builds on the previous one. Models (1) and (5) include variables capturing standard personal characteristics: gender, age, education level, income, the degree of urbanism of the respondents’ place of residence and migration background. The variable *large bank* is also included in these models. In the model for narrow-scope trust, we follow van der Crujnsen et al. (2021) and include broad-scope trust in view of the results of previous studies (see column 5). If the variable of main interest, i.e., belonging to a group at risk, is positively related to broad-scope trust, not controlling for broad-scope trust in the model for narrow-scope trust implies an omitted variable problem, which may affect the coefficient and significance of the variable of interest. In models (2) and (6), we add the groups at risk variables (physical and mental impairments, low digital literacy and financial difficulties). In models (3) and (7) variables reflecting general satisfaction with payment and payment instrument preferences are added, and models (4) and (8) take up variables capturing the usage of financial products. In each model, month of the year and day of the week dummies are included to control for time effects.

4.1. Broad-scope trust

Our estimates suggest that broad-scope trust is related to belonging to certain groups at risk, other personal characteristics, payment preferences, and financial products the respondent owns. Being female, having a low or middle (or unknown) income, low education level, and living in a (very) rural area are significantly and negatively related to broad-scope trust in the payment system.

Moreover, for respondents with a non-Western migration background there is a significant negative association with broad-scope trust in the first model. The relation becomes insignificant for first-generation non-Western immigrants when we add groups of risk variables to the model (columns 2 and 4) and also for the second-generation non-Western immigrants when we include the preferred payment method variables (column 3 and 4). A possible explanation is that people with a migration background are more likely than other people to be in the groups at risk and to tend to use cash at the POS (van der Crujzen and Reijerink, 2023).

The level of broad-scope trust varies across groups at risk. For people who have difficulty walking or are wheelchair-bound we find a significant positive effect on trust in the payment system in general. One of the possible reasons for this finding is that these people particularly benefit from the increased ease of arranging payments from the comfort of their own home due to the digitalisation. On the contrary, blind or visually impaired people and people with limited or no hand function have lower trust in the payment system, compared to people who do not have these disabilities. A possible explanation is that people in these groups at risk experience more difficulties while operating devices such as ATMs, POS terminals, and smartphones (Broekhoff et al., 2023). Being visually impaired comes with many difficulties, also in the digital age. For example, where paying with cash offers certainty by feeling the unique features of certain coins or bills, there is much more uncertainty with digital payment methods. One has to trust the cashier that the stated amount is also what is paid at the terminal. People with low self-assessed digital skills have lower trust in the payment system in general than people with high self-assessed digital skills. Banks' active discouragement of traditional payment methods is a possible explanation for the relatively low trust among people with low digital skills.

The results imply support for the first hypothesis for three groups: blind or visually impaired people, people with limited or no hand function and people with low digital literacy. However, the opposite relation is found for people who experience difficulty walking or are wheelchair-bound. Moreover, the harder people find it to make ends meet on their income, the less they trust the payment system, which supports our second hypothesis.

We identify a significant positive relation between the level of satisfaction about how payments are conducted in the Netherlands and broad-scope trust. In general, satisfaction and trust in the Dutch payment system are both high.³ On average, broad-scope trust was 3.9 over the sample period (1 January 2022–30 June 2023) and average satisfaction was 4.0. Furthermore, people who prefer any form of debit payment (traditional, contactless, mobile phone or wearable) have more trust in the payment system compared to those who favour cash payments for POS transactions. The fact that banks have made cash payments more difficult is a plausible explanation for our finding that people with low digital literacy, people who are blind or visually impaired, people with limited or no hand function, and people who find it difficult to make ends meet on their income report lower levels of trust. This is in line with Png and Tan (2020) who find a negative relation between trust in banks and cash usage.

People who have a personal loan, investments, pension savings, or who use online banking have higher trust in the payments system than those who do not make use of these financial products. It is possible that these people are in closer contact with their bank or that their financial literacy is relatively high compared to people who do not use these products, resulting in higher levels of trust.

4.2. Narrow-scope trust

Interestingly, we find a gap between narrow-scope trust and broad-scope trust for certain groups. For broad-scope trust, we uncovered significantly lower trust for people with a low education level, low, middle or unknown income, and people who live in (very) rural areas. In terms of narrow-scope trust, we observe significant positive effects. This finding implies that people who belong to one of the aforementioned groups have lower broad-scope trust, but higher narrow-scope trust compared to the people who are not in these groups. In other words, the gap between narrow-scope trust and broad-scope trust is relatively large for people with a low education level, low, middle or unknown income and people who live in (very) rural areas. Additionally, people who arrange their banking affairs at one of the three large banks indicate lower narrow-scope trust than people who bank at smaller banks, which is also the opposite of the findings for broad-scope trust. Bijlsma et al. (2022) also conclude that the gap between narrow-scope trust and broad-scope trust is highest for customers of small banks. A possible explanation is that customers of small banks may be more likely to have made a deliberate choice for their bank. Broad-scope trust has a significant positive effect on trust in one's own bank to conduct payments. van der Crujzen et al. (2021) also report a positive relationship between broad-scope and narrow-scope trust. People with a non-Western migration background, both first- and second-generation, and second-generation Western migrants have significantly less trust in their own banks' payment services than people with another background. Unlike broad-scope trust, the effects for people with a non-Western migration background remain significant when we add variables capturing preferences and the use of financial products.

Among the physical or mental disability groups, we only uncover a significant negative effect for people who are blind or visually impaired. Thus, this group has lower trust in the payment system in general and their own banks' payment services. Similarly, there are significant negative effects for people who have low digital literacy. Hence, there is some evidence that supports the first hypothesis for this type of trust. People who experience financial difficulties also have lower trust in the payment services of their own bank (except for people who find it very hard to get by on their income in the third and fourth model). This implies that our second hypothesis is supported for narrow-scope trust.

Narrow-scope trust is relatively low among people who prefer cash and who are dissatisfied with how payments are conducted in general. This result is in line with the effects found for broad-scope trust. Contrary to the broad-scope model, having an investment has a negative effect on narrow-scope trust. This may be caused by the low interest rates offered by Dutch banks throughout the sample

³ As satisfaction may be related to trust, we have also run the regressions without satisfaction. The results of these alternative regression models (available upon request) are very similar to those in the baseline model.

period compared to the European Central Bank (ECB)'s policy rates, and possibly the difference between these interest rates and expected return on for example stocks.

4.3. Average marginal effects

For each model, we examine the average marginal effects (AMEs) for the groups at risk. AMEs provide helpful insights into how explanatory variables influence the expected value of the dependent variable at a certain value, while accounting for the other explanatory variables in the model. This is especially useful in non-linear models, such as the ordered logit model that we use, as direct interpretation of the regression coefficients is not possible.

Table 3 shows the AMEs for groups at risk on the probability of exhibiting the highest levels of broad-scope or narrow-scope trust for the models in Table 2. When we focus on the AMEs of the full model (columns 3 and 6 in Table 3), we find that having difficulty walking or being wheelchair-bound increases the probability of having very much broad-scope trust by 2 percentage points. The other significant effects are negative and thus belonging to that group yields a lower probability of having very much broad-scope or complete narrow-scope trust. This is especially relevant for people who find it hard or very hard to make ends meet on their income with regard to the trust in the payment system in general. For example, the probability of having very much trust in the payment system in general is 14 percentage points lower for people who find it hard to make ends meet compared to a person who finds it very easy. The probability of having very much broad-scope trust is 1 percentage points lower for people who are deaf or hearing impaired, 4 percentage points lower for people who are blind or visually impaired, and 3 percentage points lower for people with a limited or no hand function compared to other people. As mentioned before, for narrow-scope trust we only find a significant effect for blind or visually impaired people. The probability of having complete trust in one's own bank is 7 percentage points lower for this group than for others. People who assess their digital literacy as low are less likely to have the highest levels of trust compared to those who rate their digital literacy as high. The effect on the probability is -5 percentage points for broad-scope trust and -3 percentage points for narrow-scope trust.

To gain more insights in the AMEs over all levels of trust, we present figures for three groups: people who are blind or visually impaired (Fig. 3a), people with a low self-assessed digital literacy (Fig. 3b), and people who find it hard to make ends meet (Fig. 3c). We find the strongest effects for these groups at risk. The AMEs shown are based on the full models of Table 2 (see columns 4 and 8). People who are blind or visually impaired, people with a low self-assessed digital literacy, and people who find it hard to make ends meet are less likely to have the highest level of broad-scope and narrow-scope trust (category 5) than other people. For broad-scope trust this mainly goes along with an increased likelihood of having a neutral trust level (category 3), and for narrow-scope trust it is especially the likelihood of mostly trusting the bank (category 4) that is higher for people in these groups at risk.

4.4. Qualitative analysis

This section presents the findings of the qualitative analysis, which sought to uncover the underlying reasons why people have little or very little trust in the payment system in general. The analysis provides not only a deeper understanding of the perceptions and viewpoints of the respondents, but also contributes to a broader discussion on what factors influence trust in the payment system. The findings are supported by illustrative quotes based on responses to provide a more complete and comprehensive view.

Table 3

Average marginal effects for groups at risk on the probability of very much broad-scope trust or complete narrow-scope trust.

| | Broad-scope trust | | | Narrow-scope trust | | |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Physical or mental disability | | | | | | |
| Difficulty walking or wheelchair-bound | 0.02* (0.009) | 0.02*** (0.008) | 0.02*** (0.008) | 0.01 (0.012) | 0.02 (0.012) | 0.01 (0.012) |
| Deaf or hearing impaired | 0.00 (0.008) | -0.01* (0.008) | -0.01* (0.008) | 0.00 (0.011) | -0.01 (0.011) | -0.01 (0.011) |
| Blind or visually impaired | -0.04*** (0.013) | -0.04*** (0.012) | -0.04*** (0.012) | -0.07*** (0.017) | -0.07*** (0.017) | -0.07*** (0.017) |
| Limited or no hand function | -0.05*** (0.013) | -0.03** (0.012) | -0.03** (0.012) | -0.01 (0.017) | 0.00 (0.017) | 0.00 (0.017) |
| Mild intellectual disability | -0.02 (0.033) | -0.01 (0.030) | -0.01 (0.030) | 0.04 (0.036) | 0.04 (0.035) | 0.04 (0.035) |
| Digital literacy | | | | | | |
| Low | -0.10*** (0.010) | -0.05*** (0.009) | -0.05*** (0.009) | -0.04*** (0.012) | -0.03** (0.012) | -0.03** (0.012) |
| Difficulties making ends meet | | | | | | |
| Hard | -0.31*** (0.015) | -0.15*** (0.012) | -0.14*** (0.012) | -0.07*** (0.011) | -0.04*** (0.011) | -0.05*** (0.011) |
| Very hard | -0.39*** (0.032) | -0.19*** (0.025) | -0.18*** (0.025) | -0.05*** (0.020) | -0.02 (0.021) | -0.03 (0.021) |

Note: The table reports average marginal effects of the ordered logit models of Table 2 columns 2 to 4 and columns 6 to 8. Standard errors are shown in parentheses. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively.

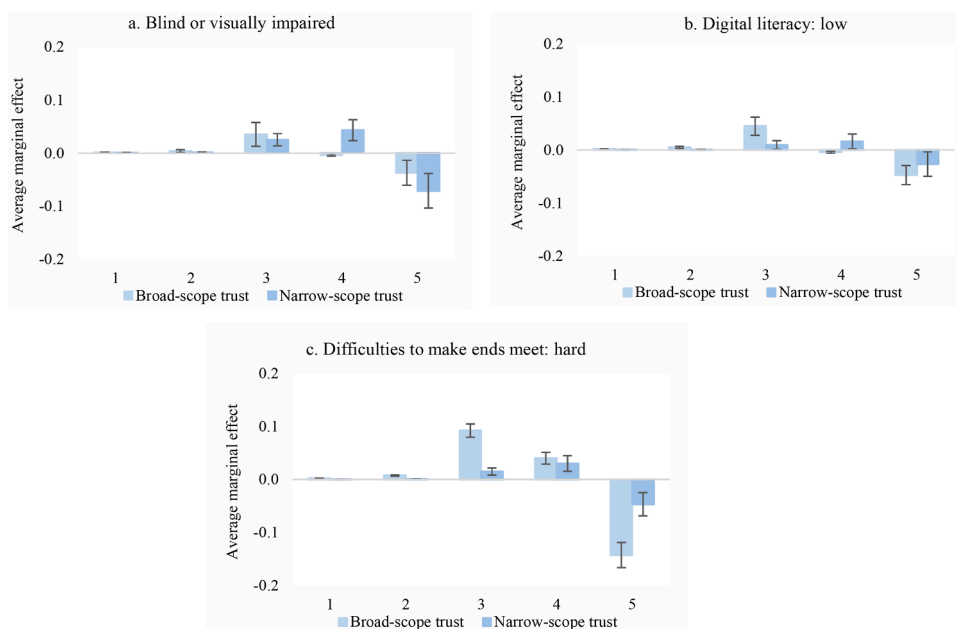


Fig. 3. Average marginal effects for three groups at risk.

Note: The figures include 95% confidence intervals. The x-axis in the figures represents the five categories for broad- and narrow-scope trust. For broad-scope trust these categories are 1 ‘very little trust’, 2 ‘little trust’, 3 ‘neutral’, 4 ‘much trust’ and 5 ‘very much trust’. For narrow-scope trust these categories are 1 ‘no trust at all’, 2 ‘mostly no trust’, 3 ‘neutral’, 4 ‘mostly trust’ and 5 ‘complete trust’.

We identified six themes based on the 254 responses: banks, interruption & issues, digitalisation, safety, government and other. Each theme was then divided into categories to further describe the perspectives of respondents. In Fig. 4, the summarised and categorised data is presented. Some responses were counted in multiple themes and categories as they referred to more than one reason why trust in the payment system is low. For almost each theme there is a category *general*, which corresponds to responses that only mentioned the theme (such as banks) without further specification.

Issues with banks were mentioned most often, in 38% of the responses that were included in the qualitative analysis. Upon examining in more detail why banks are the cause of low trust in the payment system, we find that people feel that banks have too much control and insights into people’s transactions. One respondent answered: “*Because banks have to keep an eye on my finances and I don’t think this belongs to a commercial company*”. The second most mentioned reason not to trust banks is the high costs for bank and payment services, followed by a general distrust in banks. Respondents who state that low trust is due to the policy of the bank, often associate this with the low interest rates on savings and high risk taking with investments.

The second theme, interruption and issues, was mentioned in 15% of the responses, which is mostly related to interruption of payment services such as an ATM, online banking or paying with a debit card at the POS. Furthermore, respondents in this category often stated that there are generally a lot of issues, which could be interpreted as a general distrust in the payment system.

The digitalisation and safety themes were mentioned in around 14% of the responses and are especially relevant for groups at risks. For example, people are afraid that cash will disappear in the near future due to the declining use of cash or they are afraid of becoming victims of cybercrime, scams or fraud. With regard to digitalisation a respondent states: “*I find that they automate things too much and there is only limited possibility for personal contact. Bank locations are closed and to get help in person you have to drive a couple kilometres to get to a location.*”

The government was included in 8% of the answers, mostly by people who find that the government has too much control and insights into transactions. This category was also often mentioned under the bank theme; people frequently stated that they distrusted both the government and banks. Compared to other institutions such as DNB, the ECB or financial institutions, trust in the government is relatively low in the Netherlands. In 2023, 22% of the respondents participating in the annual DNB Trust Survey reported having trust in politics [DNB, 2023b](#).

Responses gathered under the other theme (10% of all responses) mostly included personal stories or general comments that did not fit within any of the previously mentioned themes. Examples include problems with payments in public transport or to energy companies, distrust of people, distrust in general and distrust in insurance companies.

5. Sensitivity analysis

We have run several additional regressions to verify the robustness of our findings. The baseline models are those in columns (4) and (8) in Table 2. In the first and second sensitivity analysis we focus on how we defined the groups at risk and in the final two

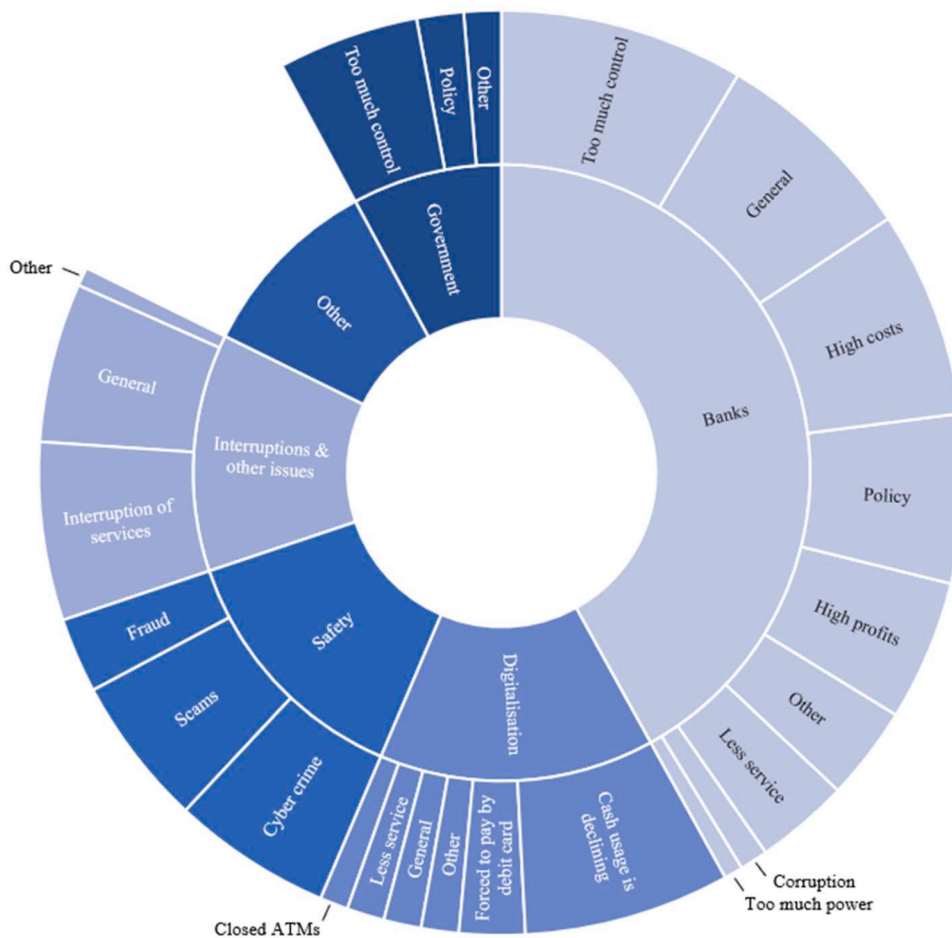


Fig. 4. Qualitative analysis.

Note: The inner ring denotes the six pre-identified themes. The sub-categories are shown in the outer ring of each theme. The figure is based on the relative shares of responses in each theme and category.

analyses we explore controls for time effects and the effect of changes in the sample. The results of these sensitivity analyses for the groups at risk variables are listed in Appendix C. The full regression tables are available upon request.

Our findings are largely robust to alternative variables to capture digital literacy. With this sensitivity analysis we explore both our definition of digital literacy and examine whether an objective measure such as participating by telephone because of a lack of internet access yields the same results as a more subjective self-reported measure. Columns (2) and (5) in Table C.1 show the results when the definition of *digital literacy: low* is redefined. Instead of categorising everyone who reports a grade 5 or lower for digital literacy in the low digital literacy group, we assign low digital literacy to everyone who reports a grade of 6 or lower. 11.1% of the sample belongs to the group with low digital skills when we define the variable like this. As in the baseline case, we find significant negative associations between self-reported digital literacy and broad-scope and narrow-scope trust. In columns (3) and (6) of Table C.1, the variable *digital literacy: low* is replaced by the variable *participated by phone*. This binary variable is 1 if the person participated in the SCP by phone, which is true for 1.7% of the sample. Individuals who participated by phone exhibit significantly lower levels of broad-scope trust compared to those who participated online. However, there is no difference in terms of narrow-scope trust.

Table C.2 in Appendix C shows the results of regressions that include an alternative variable capturing respondents facing financial difficulties. The *difficulties making ends meet* variables are replaced by *debt restructuring*, which takes a value of 1 if the respondent is enrolled in a debt restructuring programme. Data on debt restructuring is only available for the 2022 sample. The coefficients of *debt restructuring* are negative but insignificant (see columns (2) and (4)). A possible explanation for the insignificance is the small group enrolled in a personal debt restructuring programme. Less than 1% of the 2022 sample self-reported to be enrolled in such a programme.

Finally, findings are very similar to our baseline regression when we alter the time control variables (Table C.3) and change the sample (Table C.4). As a substitute for month of the year and day of the week effects, we include week number/year or day of the month effects. The results are nearly identical to those of our baseline model. Our baseline regression can include up to six observations per individual as they can participate at most once every quarter. Most respondents have filled out the questionnaire one to three times

in the baseline sample. When we only include the first observation of each respondent, the number of observations drops to 72% of that in the baseline sample. Our results are resilient to these changes.

6. Conclusion and policy implications

The Dutch payment system enjoys a commendable level of trust among its residents. 73% of survey respondents express trust in the Dutch payment system overall. Furthermore, an impressive 92% of respondents trust their respective banks' proficiency in handling their payments adequately.

However, when examining trust within more vulnerable segments of the population, a nuanced perspective emerges. Our study uncovers lower trust in the payment system among several groups at risk compared to people who are not in these groups. Respondents with lower levels of digital literacy, those facing financial challenges, or dealing with visual impairments exhibit below-average levels of broad-scope and narrow-scope trust. Respondents with little broad-scope trust report various reasons, such as dissatisfaction with banks' policies and costs associated with bank services, interruptions in the payment system and the ongoing digitalisation of payment services.

The results of this study underscore the critical importance of cultivating an accessible and inclusive payment system from a trust-centred standpoint. Trust in the payment system is relatively low among particular groups at risk. Banks should consider devoting more attention and resources to satisfy their customers and help them navigate the world of payments. There are several ways to improve satisfaction and thereby trust in the payment system (Broekhoff et al., 2023). First, it is crucial to preserve and improve the non-digital payment world, such as by maintaining sufficient physical contact points of the bank and its employees and improving telephone customer service. Second, banks can raise awareness of existing initiatives to improve the accessibility of the payment system and the assistance offered to bank customers while also launching new initiatives. Our findings emphasise the significance of effective communication. By tailoring communication strategies to target groups struggling with the digital payment landscape, banks can enhance their awareness of non-digital alternatives and available assistance, thereby fostering trust. Initiatives aimed at enhancing digital skills and mitigating concerns related to the digitalisation of payments may also positively impact trust in the payment system. Third, banks can better utilise technology to increase accessibility, such as by making use of biometrics for people who have difficulty remembering and entering codes. Fourth, banks could tailor the digital environment more effectively to the user. For example, while instructional videos are helpful for groups that have difficulty reading, they are not useful for blind people. Our finding of lower trust among groups at risk further underscores the need for these actions. Banks and policymakers need to prevent trust decreases because low trust can result in hesitance to use payment services, even though they are essential for participating in society. This may also harm the financial services industry and, thereby, the economy. Trust decreases can also lead to financial instability. Consequently, the policy implication entails that both commercial and central banks must persist in their endeavours to enhance the system's accessibility and ensure the ongoing availability of cash.

Discussing the financial inclusion literature, Ozili (2021, p. 469) points to the identity problem in financial inclusion research that occurs when the excluded members of the population cannot be accurately identified. "Because researchers are not privy to full information about which members of the population are excluded from the formal financial sector, it can be difficult to accurately identify the excluded population, and even more difficult to rely on the findings of studies whose identification methods and assumptions are unknown. Therefore, financial inclusion research may be complicated by the process, assumptions, methods and other unobservable criteria used to identify the 'excluded members of the population' in the sample size in many studies." Our study has identified several groups of people who may have difficulties participating in the payment system. A suggestion for future research is to do similar analyses for other countries, so that it becomes clear to what extent our results also hold for other countries. Finally, future research should provide new ideas, strategies and interventions that increase financial inclusion notably for groups at risk of being excluded due to digitalisation.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to improve the writing style and to get inspiration for the title. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Appendix A. Questions on trust in the SCP

Table A.1

An overview of the three questions on trust in the SCP.

| Type of trust | Dutch question | Dutch answer options | English question | English answer options |
|--------------------|--|---|--|--|
| Narrow-scope trust | Hebt u er vertrouwen in dat <naam bank> in staat is om uw betaling goed te laten verlopen? | 1. Ja, volledig 2. Ja, overwegend wel 3. Neutraal | Do you trust <bank name>'s ability to process your payment adequately? | 1. Yes, completely 2. Yes, mostly 3. Neutral |

(continued on next page)

Table A.1 (continued)

| Type of trust | Dutch question | Dutch answer options | English question | English answer options |
|-------------------|--|---|--|--|
| | | 4. Nee, overwegend niet 5. Nee, in het geheel niet | | 4. No, mostly not 5. No, not at all |
| Broad-scope trust | In welke mate hebt u vertrouwen in het Nederlandse betalingsverkeer in het algemeen? | 1. Zeer veel vertrouwen 2. Veel vertrouwen 3. Neutraal 4. Weinig vertrouwen 5. Zeer weinig vertrouwen | To what degree do you have trust in the Dutch payment system in general? | 1. Very much trust 2. Much trust 3. Neutral 4. Little trust 5. Very little trust |
| Broad-scope trust | Waarom heeft u weinig of zeer weinig vertrouwen in het Nederlandse betalingsverkeer? | Open question | Why do you have little or very little trust in the Dutch payment system? | Open question |

Note: In the analysis we reverse the answer categories for easier interpretation. In the question on narrow-scope trust the name of the bank is determined by a previous question in the SCP that asks respondents to list a maximum of three banks where they have a payment account with a debit card. If more than one bank is listed in that question a random bank is chosen to be shown in the narrow-scope question. When the respondent is a customer of a smaller bank, the narrow-scope trust question pertains either to the specific bank in question or, if the respondent holds accounts with multiple smaller banks, to one of these smaller banks selected through a random process.

Appendix B. Description of variables and summary statistics

Table B.1

Descriptive statistics of the dependent variables.

| Variable | Type | Description | Mean | St. dev. | Min | Max | N |
|--------------------|----------|---|-------|----------|-----|-----|--------|
| Broad-scope trust | Category | To what degree the respondent has trust in the Dutch payment system (scale 1 to 5) | 3.931 | 0.749 | 1 | 5 | 33,169 |
| Narrow-scope trust | Category | To what degree the respondent has trust in their own bank to process payments adequately (scale 1 to 5) | 4.549 | 0.668 | 1 | 5 | 33,169 |

Note: This table describes the dependent variables used in the regressions of which the results are reported in [Tables 1](#) and [2](#). The mean, standard deviation (st. dev.), minimum (min), maximum (max) and number of observations (N) are reported for the sample included in these regressions.

Table B.2

Descriptive statistics of the groups at risk variables.

| Variable | Type | Description | Mean | St. dev. | Min | Max | N |
|--|--------|--|-------|----------|-----|-----|--------|
| Physical or mental disability | | | | | | | |
| Difficulty walking or wheelchair-bound | Binary | 1 = respondents has difficulty walking or is wheelchair-bound, 0 = else | 0.055 | 0.227 | 0 | 1 | 33,169 |
| Deaf or hearing impaired | Binary | 1 = respondent is deaf or hearing impaired, 0 = else | 0.053 | 0.223 | 0 | 1 | 33,169 |
| Blind or visually impaired | Binary | 1 = respondent is blind or visually impaired, 0 = else | 0.019 | 0.135 | 0 | 1 | 33,169 |
| Limited or no hand function | Binary | 1 = respondent has limited or no hand function, 0 = else | 0.021 | 0.143 | 0 | 1 | 33,169 |
| Mild intellectual disability | Binary | 1 = respondent has a mild intellectual disability, 0 = else | 0.005 | 0.072 | 0 | 1 | 33,169 |
| Digital literacy | | | | | | | |
| Low | Binary | 1 = respondents' self-assessed digital literacy is grade 5 or lower on a scale of 1 to 10, 0 = else | 0.043 | 0.203 | 0 | 1 | 33,169 |
| High ¹ | Binary | 1 = respondents' self-assessed digital literacy is grade 6 or higher on a scale of 1 to 10, 0 = else | 0.957 | 0.203 | 0 | 1 | 33,169 |
| Difficulties making ends meet | | | | | | | |
| Very easy ¹ | Binary | 1 = respondent finds it very easy to make ends meet with their income, 0 = else | 0.135 | 0.342 | 0 | 1 | 33,169 |
| Easy | Binary | 1 = respondent finds it easy to make ends meet with their income, 0 = else | 0.398 | 0.49 | 0 | 1 | 33,169 |
| Neither hard, nor easy | Binary | 1 = respondent finds it neither hard, nor easy to make ends meet with their income, 0 = else | 0.377 | 0.485 | 0 | 1 | 33,169 |
| Hard | Binary | 1 = respondent finds it hard to make ends meet with their income, 0 = else | 0.073 | 0.26 | 0 | 1 | 33,169 |
| Very hard | Binary | 1 = respondent finds it very hard to make ends meet with their income, 0 = else | 0.016 | 0.126 | 0 | 1 | 33,169 |

Note: This table describes the groups at risk variables used in the regressions of which the results are reported in Tables 1 and 2. The mean, standard deviation (st. dev.), minimum (min), maximum (max) and number of observations (N) are reported for the sample included in these regressions. ^[1] Reference category.

Table B.3

Descriptive statistics of the control variables.

| Variable | Type | Description | Mean | St. dev. | Min | Max | N |
|---|----------|---|-------|----------|-----|-----|--------|
| Male | Binary | 1 = respondent is male, 0 = female | 0.484 | 0.500 | 0 | 1 | 33,169 |
| Partner | Binary | 1 = respondent is married or lives together, 0 = else | 0.623 | 0.485 | 0 | 1 | 33,169 |
| <i>Age</i> | | | | | | | |
| 12 to 24 years ¹ | Binary | 1 = respondent is between 12 and 24 years old, 0 = else | 0.120 | 0.325 | 0 | 1 | 33,169 |
| 25 to 34 years | Binary | 1 = respondent is between 25 and 34 years old, 0 = else | 0.079 | 0.270 | 0 | 1 | 33,169 |
| 35 to 44 years | Binary | 1 = respondent is between 35 and 44 years old, 0 = else | 0.129 | 0.335 | 0 | 1 | 33,169 |
| 45 to 54 years | Binary | 1 = respondent is between 45 and 54 years old, 0 = else | 0.198 | 0.399 | 0 | 1 | 33,169 |
| 55 to 64 years | Binary | 1 = respondent is between 55 and 64 years old, 0 = else | 0.221 | 0.415 | 0 | 1 | 33,169 |
| 65 to 74 years | Binary | 1 = respondent is between 65 and 74 years old, 0 = else | 0.155 | 0.362 | 0 | 1 | 33,169 |
| 75 years or older | Binary | 1 = respondent is 75 years or older, 0 = else | 0.099 | 0.299 | 0 | 1 | 33,169 |
| <i>Education</i> | | | | | | | |
| Low | Binary | 1 = respondent has finished no education/primary school/courses/LBO/VBO/VMBO/MBO 1/ MAVO/HAVO/VWO (first 3 years)/ULO/MULO/VSO or MBO 2, 3, 4/MBO, 0 = else | 0.505 | 0.500 | 0 | 1 | 33,169 |
| High ¹ | Binary | 1 = respondent has finished HAVO/VWO (more than three years)/HBS/MMS/HBO first year, WO first year, HBO/WO bachelor, WO/HBO or PhD, 0 = else | 0.495 | 0.500 | 0 | 1 | 33,169 |
| <i>Income</i> | | | | | | | |
| Low | Binary | 1 = gross annual household income is less than €3,400, 0 = else or unknown | 0.141 | 0.348 | 0 | 1 | 33,169 |
| Middle | Binary | 1 = gross annual household income ≥ €23,400 and < €65,000, 0 = else or unknown | 0.406 | 0.491 | 0 | 1 | 33,169 |
| High ¹ | Binary | 1 = gross annual household income ≥ €65,000, 0 = else or unknown | 0.211 | 0.408 | 0 | 1 | 33,169 |
| Unknown | Binary | 1 = gross annual household income is unknown, 0 = income is known | 0.242 | 0.428 | 0 | 1 | 33,169 |
| <i>Urbanism</i> | | | | | | | |
| Very urban ¹ | Binary | 1 = respondent lives in very urban area, 0 = else | 0.216 | 0.411 | 0 | 1 | 33,169 |
| Urban | Binary | 1 = respondent lives in urban area, 0 = else | 0.346 | 0.476 | 0 | 1 | 33,169 |
| Moderately urban | Binary | 1 = respondent lives in moderately urban area, 0 = else | 0.165 | 0.371 | 0 | 1 | 33,169 |
| Rural | Binary | 1 = respondent lives in rural area, 0 = else | 0.198 | 0.399 | 0 | 1 | 33,169 |
| Very rural | Binary | 1 = respondent lives in very rural area, 0 = else | 0.076 | 0.264 | 0 | 1 | 33,169 |
| <i>Migration background</i> | | | | | | | |
| Western first-generation | Binary | 1 = Western first-generation migration background, 0 = else | 0.028 | 0.165 | 0 | 1 | 33,169 |
| Western second-generation | Binary | 1 = Western second-generation migration background, 0 = else | 0.083 | 0.276 | 0 | 1 | 33,169 |
| Non-Western first-generation | Binary | 1 = non-Western first-generation migration background, 0 = else | 0.027 | 0.162 | 0 | 1 | 33,169 |
| Non-Western second-generation | Binary | 1 = non-Western second-generation migration background, 0 = else | 0.032 | 0.175 | 0 | 1 | 33,169 |
| Large bank | Binary | 1 = respondent answered the narrow-scope trust question for a large bank (ABN AMRO, ING or Rabobank), 0 = else | 0.825 | 0.380 | 0 | 1 | 33,169 |
| Satisfaction | Category | To what degree the respondent is satisfied how payments are conducted in general | 4.066 | 0.781 | 1 | 5 | 33,169 |
| <i>Preferred payment method</i> | | | | | | | |
| Cash ¹ | Binary | 1 = preferred payment method of respondent is cash, 0 = else | 0.191 | 0.393 | 0 | 1 | 33,169 |
| Debit card traditional | Binary | 1 = preferred payment method of respondent is debit card traditional, 0 = else | 0.128 | 0.334 | 0 | 1 | 33,169 |
| Debit card contactless | Binary | 1 = preferred payment method of respondent is debit card contactless, 0 = else | 0.483 | 0.5 | 0 | 1 | 33,169 |
| Contactless with mobile phone or wearable | Binary | 1 = preferred payment method of respondent is contactless with mobile phone or wearable, 0 = else | 0.163 | 0.369 | 0 | 1 | 33,169 |
| PIN, no preference | Binary | 1 = preferred payment method of respondent is PIN in general, 0 = else | 0.035 | 0.183 | 0 | 1 | 33,169 |
| <i>Use of financial products</i> | | | | | | | |
| Mortgage | Binary | 1 = respondent has a mortgage, 0 = else | 0.518 | 0.500 | 0 | 1 | 33,169 |
| Personal loan | Binary | 1 = respondent has a personal loan, 0 = else | 0.055 | 0.227 | 0 | 1 | 33,169 |
| Savings | Binary | 1 = respondent has savings, 0 = else | 0.844 | 0.363 | 0 | 1 | 33,169 |
| Online banking | Binary | 1 = respondent uses online banking, 0 = else | 0.838 | 0.369 | 0 | 1 | 33,169 |
| Pension | Binary | 1 = respondent saves for a pension, 0 = else | 0.533 | 0.499 | 0 | 1 | 33,169 |
| Investment | Binary | 1 = respondent has an investment, 0 = else | 0.213 | 0.410 | 0 | 1 | 33,169 |

Note: This table describes the control variables used in the regressions of which the results are reported in Tables 1 and 2. The mean, standard deviation (st. dev.), minimum (min), maximum (max) and number of observations (N) are reported for the sample included in these regressions. ^[1] Reference category.

Appendix C. Sensitivity analysis

Table C.1

Sensitivity analysis: digital literacy.

| | Broad-scope trust | | | Narrow-scope trust | | |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Physical or mental disability | | | | | | |
| Difficulty walking or wheelchair-bound | 0.16*** (0.059) | 0.17*** (0.059) | 0.15** (0.059) | 0.09 (0.071) | 0.10 (0.071) | 0.09 (0.071) |
| Deaf or hearing impaired | -0.10* (0.053) | -0.09* (0.053) | -0.09* (0.053) | -0.05 (0.067) | -0.05 (0.067) | -0.05 (0.067) |
| Blind or visually impaired | -0.26*** (0.085) | -0.25*** (0.085) | -0.24*** (0.084) | -0.43*** (0.102) | -0.42*** (0.102) | -0.44*** (0.102) |
| Limited or no hand function | -0.21*** (0.083) | -0.21** (0.083) | -0.20** (0.083) | -0.03 (0.105) | -0.02 (0.105) | -0.03 (0.105) |
| Mild intellectual disability | -0.04 (0.209) | 0.02 (0.211) | -0.07 (0.208) | 0.25 (0.212) | 0.26 (0.212) | 0.23 (0.214) |
| Digital literacy | | | | | | |
| Low (grade ≤ 5) | -0.33*** (0.065) | | | -0.16** (0.072) | | |
| Low (grade ≤ 6) | | -0.36*** (0.040) | | | -0.22*** (0.045) | |
| Participated by phone | | | -0.44*** (0.082) | | | 0.00 (0.115) |
| Difficulties making ends meet¹ | | | | | | |
| Easy | -0.47*** (0.039) | -0.46*** (0.039) | -0.47*** (0.039) | -0.19*** (0.050) | -0.18*** (0.050) | -0.19*** (0.050) |
| Neither hard, nor easy | -0.82*** (0.044) | -0.81*** (0.044) | -0.83*** (0.044) | -0.34*** (0.053) | -0.33*** (0.053) | -0.34*** (0.053) |
| Hard | -0.82*** (0.063) | -0.80*** (0.063) | -0.83*** (0.063) | -0.29*** (0.073) | -0.28*** (0.073) | -0.30*** (0.073) |
| Very hard | -1.03*** (0.138) | -1.02*** (0.138) | -1.05*** (0.138) | -0.17 (0.131) | -0.16 (0.131) | -0.17 (0.131) |
| Month effects | yes | yes | yes | yes | yes | yes |
| Weekday effects | yes | yes | yes | yes | yes | yes |
| Observations | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 |
| Individuals | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 |
| Wald χ^2 | 5472.8*** | 5574.7*** | 5473.5*** | 6990.5*** | 6989.2*** | 6986.4*** |
| Pseudo R ² | 0.134 | 0.135 | 0.134 | 0.204 | 0.204 | 0.204 |

Note: The table reports parameter estimates of ordered logit models for the groups at risk. Columns 1 and 4 represent the baseline regression as reported in Table 2. Standard errors are clustered by individual and shown in parentheses. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. ^[1] The reference category is difficulties making ends meet: very easy.

Table C.2

Sensitivity analysis: difficulties making ends meet.

| | Broad-scope trust | | Narrow-scope trust | |
|--|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) |
| Physical or mental disability | | | | |
| Difficulty walking or wheelchair-bound | 0.16*** (0.059) | 0.15** (0.069) | 0.09 (0.071) | 0.09 (0.087) |
| Deaf or hearing impaired | -0.10* (0.053) | -0.11* (0.063) | -0.05 (0.067) | -0.11 (0.081) |
| Blind or visually impaired | -0.26*** (0.085) | -0.31*** (0.096) | -0.43*** (0.102) | -0.49*** (0.119) |
| Limited or no hand function | -0.21*** (0.083) | -0.25** (0.101) | -0.03 (0.105) | 0.08 (0.130) |
| Mild intellectual disability | -0.04 (0.209) | 0.12 (0.253) | 0.25 (0.212) | 0.44 (0.278) |
| Digital literacy | | | | |
| Low | -0.33*** (0.065) | -0.38*** (0.075) | -0.16** (0.072) | -0.13 (0.083) |
| Difficulties making ends meet¹ | | | | |
| Easy | -0.47*** (0.039) | | -0.19*** (0.050) | |
| Neither hard, nor easy | -0.82*** | | -0.34*** | |

(continued on next page)

Table C.2 (continued)

| | Broad-scope trust | | Narrow-scope trust | |
|-----------------------|-------------------|-----------|--------------------|-----------|
| | (1) | (2) | (3) | (4) |
| | (0.044) | | (0.053) | |
| Hard | -0.82*** | | -0.29*** | |
| | (0.063) | | (0.073) | |
| Very hard | -1.03*** | | -0.17 | |
| | (0.138) | | (0.131) | |
| Debt restructuring | | -0.15 | | -0.07 |
| | | (0.172) | | (0.185) |
| Month effects | yes | yes | yes | yes |
| Weekday effects | yes | yes | yes | yes |
| Observations | 33,169 | 21,787 | 33,169 | 21,787 |
| Individuals | 23,967 | 17,704 | 23,967 | 17,704 |
| Wald χ^2 | 5472.8*** | 3496.2*** | 6990.5*** | 4646.7*** |
| Pseudo R ² | 0.134 | 0.128 | 0.204 | 0.203 |

Note: The table reports parameter estimates of ordered logit models for the groups at risk variables. Columns 1 and 3 represent the baseline regression as reported in Table 2. Standard errors are clustered by individual and shown in parentheses. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. ^[1] The reference category is difficulties making ends meet: very easy.

Table C.3

Sensitivity analysis: time effects.

| | Broad-scope trust | | | Narrow-scope trust | | |
|--|-------------------|-----------|-----------|--------------------|-----------|-----------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Physical or mental disability | | | | | | |
| Difficulty walking or wheelchair-bound | 0.16*** | 0.17*** | 0.16*** | 0.09 | 0.10 | 0.09 |
| | (0.059) | (0.059) | (0.059) | (0.071) | (0.071) | (0.071) |
| Deaf or hearing impaired | -0.10* | -0.10* | -0.10* | -0.05 | -0.05 | -0.05 |
| | (0.053) | (0.053) | (0.053) | (0.067) | (0.068) | (0.067) |
| Blind or visually impaired | -0.26*** | -0.27*** | -0.26*** | -0.43*** | -0.45*** | -0.44*** |
| | (0.085) | (0.085) | (0.084) | (0.102) | (0.102) | (0.102) |
| Limited or no hand function | -0.21*** | -0.22** | -0.21** | -0.03 | -0.02 | -0.02 |
| | (0.083) | (0.084) | (0.084) | (0.105) | (0.105) | (0.105) |
| Mild intellectual disability | -0.04 | -0.04 | -0.04 | 0.25 | 0.27 | 0.25 |
| | (0.209) | (0.209) | (0.209) | (0.212) | (0.214) | (0.213) |
| Digital literacy | | | | | | |
| Low | -0.33*** | -0.34*** | -0.33*** | -0.16** | -0.17** | -0.16** |
| | (0.065) | (0.065) | (0.065) | (0.072) | (0.072) | (0.072) |
| Difficulties making ends meet¹ | | | | | | |
| Easy | -0.47*** | -0.47*** | -0.47*** | -0.19*** | -0.19*** | -0.19*** |
| | (0.039) | (0.039) | (0.039) | (0.050) | (0.050) | (0.050) |
| Neither hard, nor easy | -0.82*** | -0.82*** | -0.82*** | -0.34*** | -0.34*** | -0.34*** |
| | (0.044) | (0.044) | (0.044) | (0.053) | (0.053) | (0.053) |
| Hard | -0.82*** | -0.82*** | -0.81*** | -0.29*** | -0.30*** | -0.29*** |
| | (0.063) | (0.063) | (0.063) | (0.073) | (0.073) | (0.073) |
| Very hard | -1.03*** | -1.03*** | -1.03*** | -0.17 | -0.17 | -0.16 |
| | (0.138) | (0.138) | (0.138) | (0.131) | (0.131) | (0.131) |
| Month effects | yes | no | no | yes | no | no |
| Weekday effect | yes | no | no | yes | no | no |
| Week/Year effect | no | yes | no | no | yes | no |
| Day effect | no | no | yes | no | no | yes |
| Observations | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 | 33,169 |
| Individuals | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 | 23,967 |
| χ^2 | 5472.8*** | 5572.1*** | 5444.3*** | 6990.5*** | 7090.1*** | 7005.9*** |
| Pseudo R ² | 0.134 | 0.135 | 0.134 | 0.204 | 0.206 | 0.204 |

Note: The table reports parameter estimates of ordered logit models for the groups at risk variables. Columns 1 and 4 represent the baseline regression as reported in Table 2. Standard errors are clustered by individual and shown in parentheses. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. ^[1] The reference category is difficulties making ends meet: very easy.

Table C.4

Sensitivity analysis: only the first observation per individual.

| | Broad-scope trust | | Narrow-scope trust | |
|--|-------------------|--------------------|--------------------|--------------------|
| | (1) | (2) | (3) | (4) |
| | All observations | First observations | All observations | First observations |
| Physical or mental disability | | | | |
| Difficulty walking or wheelchair-bound | 0.16*** | 0.10* | 0.09 | 0.08 |
| | (0.059) | (0.061) | (0.071) | (0.076) |

(continued on next page)

Table C.4 (continued)

| | Broad-scope trust | | Narrow-scope trust | |
|--|-------------------------|---------------------------|-------------------------|---------------------------|
| | (1) All observations | (2) First observations | (3) All observations | (4) First observations |
| Deaf or hearing impaired | -0.10* (0.053) | -0.11** (0.055) | -0.05 (0.067) | 0.03 (0.073) |
| Blind or visually impaired | -0.26*** (0.085) | -0.30*** (0.093) | -0.43*** (0.102) | -0.49*** (0.114) |
| Limited or no hand function | -0.21*** (0.083) | -0.19* (0.096) | -0.03 (0.105) | -0.003 (0.119) |
| Mild intellectual disability | -0.04 (0.209) | -0.10 (0.247) | 0.25 (0.212) | 0.21 (0.253) |
| Digital literacy | | | | |
| Low | -0.33*** (0.065) | -0.38*** (0.070) | -0.16** (0.072) | -0.19** (0.080) |
| Difficulties making ends meet¹ | | | | |
| Easy | -0.47*** (0.039) | -0.50*** (0.043) | -0.19*** (0.050) | -0.21*** (0.055) |
| Neither hard, nor easy | -0.82*** (0.044) | -0.84*** (0.047) | -0.34*** (0.053) | -0.36*** (0.059) |
| Hard | -0.82*** (0.063) | -0.85*** (0.069) | -0.29*** (0.073) | -0.37*** (0.080) |
| Very hard | -1.03*** (0.138) | -1.13*** (0.142) | -0.17 (0.131) | -0.03 (0.149) |
| Month effects | yes | yes | yes | yes |
| Weekday effects | yes | yes | yes | yes |
| Observations | 33,169 | 23,967 | 33,169 | 23,967 |
| Individuals | 23,967 | 23,967 | 23,967 | 23,967 |
| Wald χ^2 | 5472.8*** | 4728.21*** | 6990.5*** | 5517.9*** |
| Pseudo R ² | 0.134 | 0.133 | 0.204 | 0.199 |

Note: The table reports parameter estimates of ordered logit models for the groups at risk variables. Columns 1 and 3 display outcomes derived from regressions involving all observations within our sample, while columns 2 and 4 present outcomes based on a subset comprising only the first observation of each respondent that was included in the regression in columns 1 and 3. Standard errors are clustered by individual and shown in parentheses. ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. ^[1] The reference category is difficulties making ends meet: very easy.

References

- Access to Cash Review, 2019. Access to cash review: final report. <https://www.accesstocash.org.uk/media/1071/call-for-evidence.pdf>.
- Afandi, E., Habibov, N., 2017. Pre-and post-crisis trust in banks: lessons from transitional countries. *J. Econ. Dev.* 42 (1), 73–94.
- Ampudia, M., Palligkinis, S., 2018. Trust and the household-bank relationship. ECB Working Paper 2184.
- Arango-Arango, C., Bouhdaoui, Y., Bounie, D., Eschelbach, M., Hernandez, L., 2018. Cash remains top-of-wallet! International evidence from payment diaries. *Econ. Model.* 69, 38–48.
- Avom, D., Bangaké, C., Ndoya, H., 2023. Do financial innovations improve financial inclusion? Evidence from mobile money adoption in Africa. *Technol. Forecast. Soc. Change* 190, 122451.
- Bagnall, J., Bounie, D., Huynh, K.P., Kosse, A., Schmidt, T., Schuh, S., Stix, H., 2016. Consumer cash usage: a cross-country comparison with payment diary survey data. *Int. J. Cent. Bank.* 12 (4), 1–61.
- Bijlsma, M., van der Crujisen, C., Koldijk, J., 2022. Determinants of trust in banks' payment services during COVID: an exploration using daily data. *Economist* 170, 231–256 (Leiden).
- Bravo, R., Martínez, E., Pina, J.M., 2019. Effects of customer perceptions in multichannel retail banking. *Int. J. Bank Mark.* 37 (5), 1253–1274.
- Broekhoff, M.C., van der Crujisen, C., 2022. Paying in a blink of an eye: it hurts less, but you spend more. DNB Working Paper 760.
- Broekhoff, M.C., van der Crujisen, C., Jonker, N., Reijerink, J. Umuhire, G., & Vinken, W. (2023). Digitalisation of the payment system: a solution for some, a challenge for others. DNB report, January. https://www.dnb.nl/media/v5lgqudn/impact-digitalisering_en_web.pdf.
- Carbó-Valverde, S., Maqui-López, E., Rodríguez-Fernandez, F., 2013. Trust in banks: evidence from the Spanish financial crisis. In: *Proceedings of the 26th Australasian Finance and Banking Conference* 2013.
- Chandra, S., Srivastava, S.C., Theng, Y., 2010. Evaluating the role of trust in consumer adoption of mobile payment systems: an empirical analysis. *Commun. Assoc. Inform. Syst.* 27 <https://doi.org/10.17705/1CAIS.02729>.
- Chang, C.C., Hung, J.S., 2018. The effects of service recovery and relational selling behavior on trust, satisfaction, and loyalty. *Int. J. Bank Mark.* 36 (7), 1437–1454.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., 2022. The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. World Bank Publications.
- Devlin, J.F., Ennew, C.T., Sekhon, H.S., Roy, S.K., 2015. Trust in financial services: retrospect and prospect. *J. Financ. Serv. Mark.* 20, 234–245.
- Diacon, S., Ennew, C., 1996. Ethical issues in insurance marketing in the UK. *Eur. J. Mark.* 30 (5), 67–80.
- DNB (2023). Key data for individual banks. <https://www.dnb.nl/en/statistics/dashboards/key-data-for-individual-banks/>.
- DNB (2023). Public trust in financial institutions remains stable despite turmoil in financial markets. *DNB Bulletin*. <https://www.dnb.nl/en/general-news/dnbulletin-2023/public-trust-in-financial-institutions-remains-stable-despite-turmoil-in-financial-markets/>.
- DNB & DPA, 2023. Point of sale payments 2022. <https://www.dnb.nl/media/m00mskgh/points-of-sale.pdf>.
- Duane, A., O'Reilly, P., Andreev, P., 2014. Realising M-Payments: modelling consumers' willingness to M-pay using Smart Phones. *Behav. Inform. Technol.* 33 (4), 318–334.
- Ennew, C., Sekhon, H., 2007. Measuring trust in financial services: the trust index. *Consum. Policy Rev.* 17 (2), 62–68.
- Ennew, C., Kharouf, H., Sekhon, H., 2011. Trust in UK financial services: a longitudinal analysis. *J. Financ. Serv. Mark.* 16, 65–75.

- Filipiak, U., 2016. Trusting financial institutions: out of reach, out of trust? *Q. Rev. Econ. Finance* 59, 200–214.
- Fungáčová, Z., Weill, L., 2018. Trusting banks in China. *Pac. Econ. Rev.* 23 (2), 131–149.
- Fungáčová, Z., Hasan, I., Weill, L., 2019. Trust in banks. *J. Econ. Behav. Organ.* 157, 452–476.
- Grable, J., Kwak, E.J., Archuleta, K., 2023. Distrust of banks among the unbanked and banked. *J. Bank Mark.* 41 (6), 1496–1520.
- Guiso L., 2010. A trust-driven financial crisis. Implications for the future of financial markets. *Einaudi Institute for Economic and Finance Working Paper* 1006.
- Hansen, T., 2012. Understanding trust in financial services: the influence of financial healthiness, knowledge, and satisfaction. *J. Serv. Res.* 15 (3), 280–295.
- Haufl, J.C., 2019. Reasons to switch: empowered vs less powerful bank customers. *Int. J. Bank Mark.* 37 (6), 1441–1461.
- Hernandez, L., Jonker, N., Kosse, A., 2017. Cash versus debit card: the role of budget control. *J. Consum. Aff.* 51 (1), 91–112.
- Jaffer, S., Morris, N., Vines, D., 2014. Why trustworthiness is important. *Capital Failure: Rebuilding Trust in Financial Services*. Oxford University Press, Oxford.
- Morris, N. and Vines, D. (eds.).
- Jonker, N., Plooi, M., Verburg, J., 2017. Did a public campaign influence debit card usage? Evidence from the Netherlands. *J. Financ. Serv. Res.* 52 (1–2), 89–121.
- Jonker, N., van der Cruisjes, C., Bijlsma, M., Bolt, W., 2022. Pandemic payment patterns. *J. Bank. Finance* 143, 106593.
- Kim, D., Yu, J., Hassan, M.K., 2018. Financial inclusion and economic growth in OIC countries. *Res. Int. Bus. Finance* 43, 1–14.
- Lee, C.C., Lou, R., Wang, F., 2023. Digital financial inclusion and poverty alleviation: evidence from the sustainable development of China. *Econ. Anal. Policy* 77, 418–434.
- Leyshon, A., Thrift, N., 1995. Geographies of financial exclusion: financial abandonment in Britain and the United States. *Trans. Inst. Br. Geogr.* 20, 312–341.
- Moden, N., Haines, C., Neufeld, P., 2021. How traditional banks can make the most of consumer trust. https://www.ey.com/en_lu/financial-services-emeia/how-traditional-banks-can-make-the-most-of-consumer-trust.
- Ozili, P.K., 2021. Financial inclusion research around the world: a review. *Forum Soc. Econ.* 50 (4), 457–479. <https://doi.org/10.1080/07360932.2020.1715238>.
- Phan, K.N., Ghantous, N., 2013. Managing brand associations to drive customers' trust and loyalty in Vietnamese banking. *Int. J. Bank Mark.* 31 (6), 456–480.
- Png, I.P.L., Tan, C.H.Y., 2020. Privacy, trust in banks and use of cash. *MAS Macroeconomic Review* 19 (1), 109–116.
- Riksbank, 2022. Payments report 2022. Retrieved from <https://www.riksbank.se/en-gb/payments-cash/payments-in-sweden/payments-report-2022/>.
- Rowe, B., Holland, J., Hann, A., Brown, T., 2017. Vulnerability exposed: the consumer experience of vulnerability in financial services. *ESRO for the Financial Conduct Authority*. <https://www.fca.org.uk/publication/research/vulnerability-exposedresearch.pdf>.
- Sarma, M., Pais, J., 2011. Financial inclusion and development. *J. Int. Dev.* 23 (5), 613–628.
- Sirdeshmukh, D., Singh, J., Sabol, B., 2002. Consumer trust, value, and loyalty in relational exchanges. *J. Mark.* 66 (1), 15–37.
- Spaanderman, J., 2020. The role and future of cash. *DNB Occasional Study* 18-2.
- Statistics Netherlands, 2023. Internettoegang en internetactiviteiten; persoonskenmerken. <https://opendata.cbs.nl/#/CBS/nl/dataset/84888NED/table?ts=1709536466615>.
- van der Cruisjes, C., Knoben, J., 2021. Ctrl+C Ctrl+pay: do people mirror electronic payment behavior of their peers? *J. Financ. Serv. Res.* 59 (1), 69–96.
- van der Cruisjes, C., Plooi, M., 2018. Drivers of payment patterns at the point of sale: stable or not? *Contemp. Econ. Policy* 36 (2), 363–380.
- van der Cruisjes, C., Reijerink, J., 2023. Uncovering the digital payment divide: understanding the importance of cash for groups at risk. *DNB Working Paper* 781.
- van der Cruisjes, C., Hernandez, L., Jonker, N., 2017. In love with the debit card but still married to cash. *Appl. Econ.* 49 (30), 2989–3004.
- van der Cruisjes, C., de Haan, J., Roerink, R., 2021. Financial knowledge and trust in financial institutions. *J. Consum. Aff.* 55 (2), 680–714.
- van der Cruisjes, C., de Haan, J., Roerink, R., 2023. Trust in financial institutions: a survey. *J. Econ. Surv.* 37 (4), 1214–1254.
- van Esterik-Plasmeijer, P.W.J., van Raaij, W.F., 2017. Banking system trust, bank trust, and bank loyalty. *Int. J. Bank Mark.* 35 (1), 97–111.
- Von Kalckreuth, U., Schmidt, T., Stix, H., 2014. Using cash to monitor liquidity: implications for payments, currency demand, and withdrawal behavior. *J. Money Credit Bank.* 46 (8), 1753–1785.
- Wang, Z., Wolman, A.L., 2016. Payment choice and currency use: insights from two billion retail transactions. *J. Monet. Econ.* 84, 94–115.
- World Bank, 2023. Financial inclusion. <https://www.worldbank.org/en/topic/financialinclusion>.
- Xin, H., Techatassanasontorn, A.A., Tan, F.B., 2015. Antecedents of consumer trust in mobile payment adoption. *J. Comput. Inf. Syst.* 55 (4), 1–10.
- Zajonc, R.B., 1968. Attitudinal effects of mere exposure. *J. Pers. Soc. Psychol.* 9 (2), 1–27. Pt.2.