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Marie-Claire Broekhoff, Carin van der Crujzen and Jakob de Haan

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

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De Nederlandsche Bank NV  
P.O. Box 98  
1000 AB AMSTERDAM  
The Netherlands

# Towards financial inclusion: trust in banks' payment services among groups at risk\*

Marie-Claire Broekhoff<sup>a,b</sup>, Carin van der Cruijssen<sup>a</sup>, and Jakob de Haan<sup>b, c</sup>

<sup>a</sup> De Nederlandsche Bank, Amsterdam, the Netherlands

<sup>b</sup> University of Groningen, Faculty of Economics and Business, Groningen, the Netherlands

<sup>c</sup> CESifo, Munich, Germany

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## 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 focus on people with low digital skills, disabilities or financial difficulties. Our results suggest that respondents with low digital skills or those who experience difficulties to make ends meet 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 in general, 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. The findings underscore the importance of cultivating an accessible and inclusive payment system to increase financial inclusion from a trust-centred perspective.

*Key words:* trust in payment services; customer groups at risk; broad-scope trust; narrow-scope trust; digital literacy

*JEL codes:* D12; G21; O33

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\* The corresponding author is Marie-Claire Broekhoff ([m.c.h.broekhoff@dnb.nl](mailto:m.c.h.broekhoff@dnb.nl)). We are grateful for the feedback given by Ron Berndsen, Maurice Bun, Sophie Cohen Tervaert and Jelmer Reijerink 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.

## 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, the use of contactless payment methods has surged as consumers opt for more convenient and secure payment options, which have arisen through advances in technology and the increasing use of smartphones. There is also evidence suggesting that digital payment solutions promote financial inclusion, particularly in developing countries, by providing access to financial services to individuals who are excluded from traditional financial services (Demirgüç-Kunt et al., 2022; Avom et al., 2023). This, in turn, may help alleviating poverty (Lee et al., 2023) and stimulate growth (Kim et al., 2018). However, digitalisation may also create problems for certain groups in society as they can no longer participate (fully) autonomously in payment transactions (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, 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). 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.

Trust in banks and their services is important because of financial stability concerns, financial inclusion, and the viability of financial institutions' business models (van der Crujssen 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. 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).

This paper analyses whether trust in payment services of Dutch banks is lower among groups at risk compared to people who do not belong in one of these groups. Our research focuses on people with disabilities, low digital skills or financial difficulties. The primary dataset is the Survey on Consumers' Payments (SCP), which consists of payment diaries in which consumers register their daily payments and an additional questionnaire. 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.

By using this unique dataset of daily data for Dutch consumers, we examine whether groups at risk have lower trust in the Dutch payment system (broad-scope trust) and in the payment services of their own bank (narrow-scope trust). The only paper that we are aware of that touches upon trust in banks' payment services among groups at risk is Bijlsma et al. (2022) who examine whether the COVID-19 pandemic affected trust. These authors find that both broad- and narrow-scope trust increase with digital literacy. Van der Crujisen and Reijerink (2023) analyse the importance of cash for groups at risk (people with a disability, low digital skills or financial difficulties) and conclude that cash is especially important for these groups.

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**

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).

Digitalisation of payment transactions has enabled banks to save costs directly related to the provision of payment services and payment processing. Furthermore, digitalisation leads to fewer cash payments, which also reduces costs not only for banks, but also for retailers. It also provides many benefits to bank customers. However, customers who cannot use these new digital services, for example, because they have physical or mental limitations, do not have the necessary devices or lack the skills needed, may experience a decline in banks' payment services.<sup>1</sup>

Our first hypothesis posits that individuals who encounter challenges to independently engaging in the digitalised payment system, exhibit lower levels of trust in these services compared to people who do not encounter these difficulties. The tangible character of cash helps people that have a disability or those who have limited access to the electronic payment system, to make payments autonomously (Spaanderman, 2020). Furthermore, individuals who have difficulties making ends meet are more likely to rely on cash to exercise greater control over their expenditures and manage their budgets (Hernandez et al., 2017; Broekhoff and van der Crujisen, 2022; van der Crujisen and Reijerink, 2023). With cash, they can more easily keep track of their expenses and manage their finances accordingly. Von Kalckreuth et al. (2014) stress the importance of cash (specifically in Germany) for low-income people in avoiding impulse purchases, making it easier to make ends meet and reduce debt. 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.

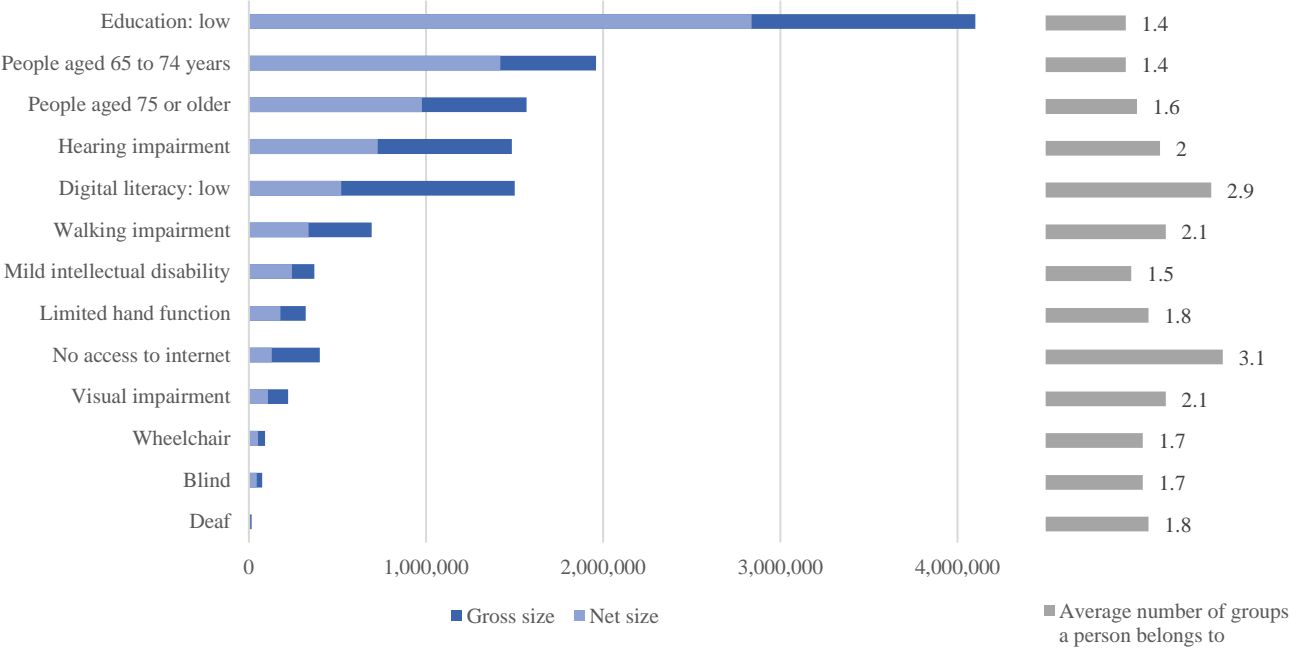
Figure 1, reproduced from Broekhoff et al. (2023), shows the gross and net size of various groups facing difficulties participating in the digitalised payment system in the Netherlands. The gross size includes the total number of adults belonging to a particular group, while the net size is the size of the group after adjustment for double counting. By far the largest group comprises low-skilled people: 4.1 million people in the Netherlands over the age of 18 fall into this group, which accounts for 29% of all Dutch

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<sup>1</sup> For instance, internet access is a prerequisite for internet or mobile banking. In 2022, 97% of the Dutch population aged 12 and over had internet access at home and 90% used it daily. Access and internet use among people aged 75 and over is relatively low: 80% had internet access and 61% used it daily (Statistics Netherlands, 2023). Having access to the internet does not mean that someone has sufficient digital skills, defined as the extent to which people are able to use digital tools and the extent to which they can properly assess the associated risks (Broekhoff et al., 2023). In 2021, 21% of the Dutch population aged between 16 and 74 had no basic digital skills, while 27% had basic skills and 52% had more than basic skills (Statistics Netherlands, 2022).

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 that older and less-educated consumers tend to use cash more frequently (Arango-Arango et al. 2018; Bagnall et al., 2016; van der Crujisen & Plooij, 2018; van der Crujisen & Reijerink, 2023).

**Figure 1. Size of various groups facing difficulties participating in the digitalised payment system**



Source: Broekhoff et al. (2023).

Another group at risk, which is not included in Figure 1, includes 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 find it easy to get by and are more likely to indicate they cannot do without cash (van der Crujisen & Reijerink, 2023).

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 & van Raaij, 2017). As pointed

out by van Esterik-Plasmeijer & 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 & 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's primary dataset is the Survey on Consumers' Payments (SCP). The data collection by Ipsos was commissioned by De Nederlandsche Bank (DNB) and the Dutch Payment Association (DPA). 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 & Knoben, 2021; Jonker et al., 2022). The SCP consists of a payment diary and an additional questionnaire. 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, supplementary



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.

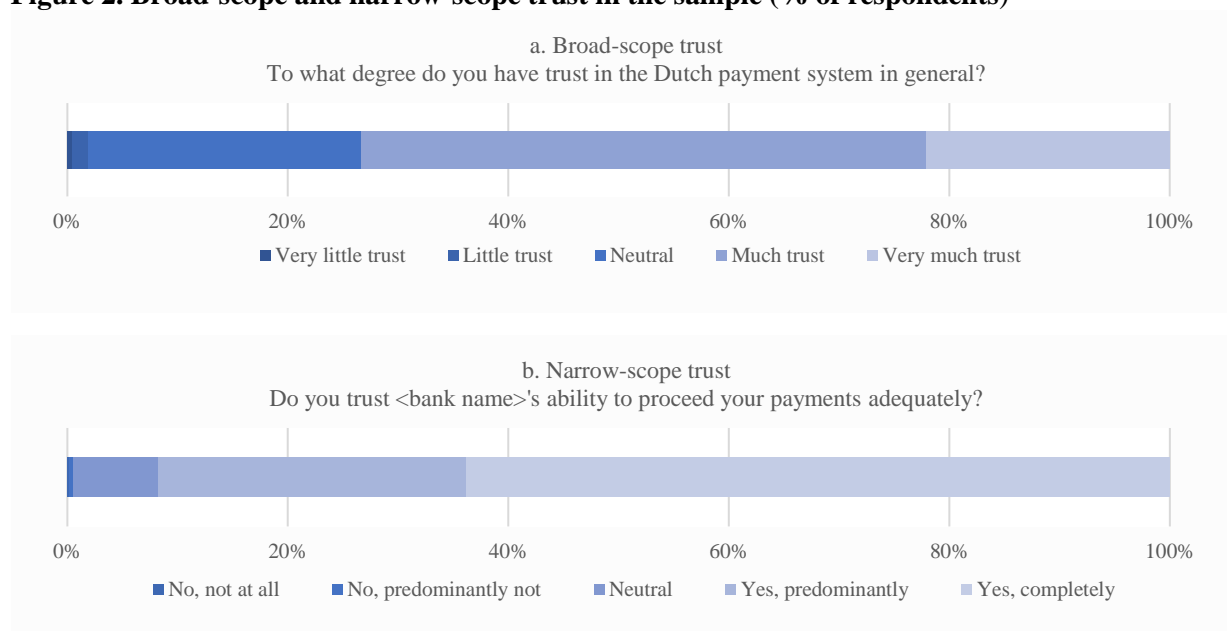
In total, the data set contains 33,169 observations (out of which 2% participated by phone and 98% online) consisting of 23,967 unique respondents. Ipsos has a group of panel members without internet access who can be contacted in writing and/or by phone for research purposes. A sample is drawn from 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. 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 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 respondents, 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.

Figure 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 Crujssen et al., 2023; van Esterik-Plasmeijer & van Raaij, 2017).

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



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

### 3.3 Explanatory variables

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

#### 3.3.1 Groups at risk

As mentioned previously, we define three groups at risk: people with a functional or mental disability, people with low digital skills, 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 0 otherwise. A respondent can belong to more than one group. In the sample, 5.5% experience difficulty walking or are wheelchair-bound, 5.3% are deaf or hearing impaired, 1.9% are blind or visually impaired, 2.1% have no or limited hand function and only 0.05% of the sample exhibit a mild intellectual disability. While these groups may seem relatively small, it is important to research them as highlighted by Broekhoff et al. (2023) and van der Crujisen and Reijerink (2023).

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’. To guide respondents, digital skills is defined in the survey as ‘*Digital skills are all skills you need to hold your own in the digital society. For example, being skilled at using a computer or mobile phone*’.

and finding your way on the internet'. On average, respondents rate themselves a 7.9 out of 10. Based on these answers, we construct a binary variable *digital literacy: low*, which takes value 1 for respondents who rate their skills a 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 reference 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).

**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\*\*\*.

### 3.3.2 Control variables

In addition to the explanatory variables capturing the groups at risk, we add a wide range of control variables. These variables can be 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 subsection 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 large bank<sup>2</sup>. 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 together 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 constructed in a similar way. *Education: low* is 1 if the respondent has a low education level and 0 otherwise. To control for 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. This holds for 82.5% of the observations.

The second set of variables capture satisfaction and payment preferences. Respondents are asked to rate their the 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. In the Netherlands, credit cards only account for about 0.5% of all POS payments (DNB & 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*

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<sup>2</sup> 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).

*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*). Among these, 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.<sup>3</sup> 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 effects (base category: *January*) and day of the week effects (base category: *Monday*). In our robustness analysis we use different variations 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. 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.

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<sup>3</sup> Life insurance was only included in the 2022 version of the SCP.

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 banks’ 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 Cruijssen 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 and weekday variables 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 point of sale (POS) (van der Cruijssen 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 for the lower trust levels of people in these groups at risk is that they 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<sup>4</sup>. 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. Van der Cruijssen and Reijerink (2023) find that cash is especially important for 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. The fact that banks have made cash payments more difficult is a plausible explanation for our finding that these groups report lower levels of trust. This is in line with findings by Png and Tan (2020) who find that 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 payment 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.

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<sup>4</sup> 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.

**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)
<i>Age (reference category: 12 to 24 years)</i>								
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)
<i>Income (reference category: high)</i>								
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)
<i>Urbanism (reference category: very urban)</i>								
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)
<i>Migration background</i>								
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)
<i>Physical or mental disability</i>								
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)

(continued on next page)



**Table 2. Broad-scope and narrow-scope trust: regression results (continued)**

	Broad-scope trust				Narrow-scope trust			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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 ( <i>reference category: very easy</i> )								
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*** (0.063)	-0.83*** (0.063)	-0.82*** (0.063)			-0.42*** (0.071)	-0.25*** (0.072)	-0.29*** (0.073)
Very hard	-1.76*** (0.139)	-1.05*** (0.138)	-1.04*** (0.138)			-0.34*** (0.130)	-0.12 (0.130)	-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 $\chi^2$	1808.9***	2974.2***	5433.4***	5472.8***	6513.9***	6645.0***	6923.4***	6990.5***
Pseudo R <sup>2</sup>	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.

#### 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. Prior studies also show a positive relationship between broad-scope and narrow-scope trust (Bijlsma et al., 2022; van der Crujisen et al., 2021). 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 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.

**Table 3. Average marginal effects for groups at risk on the probability of very much broad-scope trust or complete narrow-scope trust**

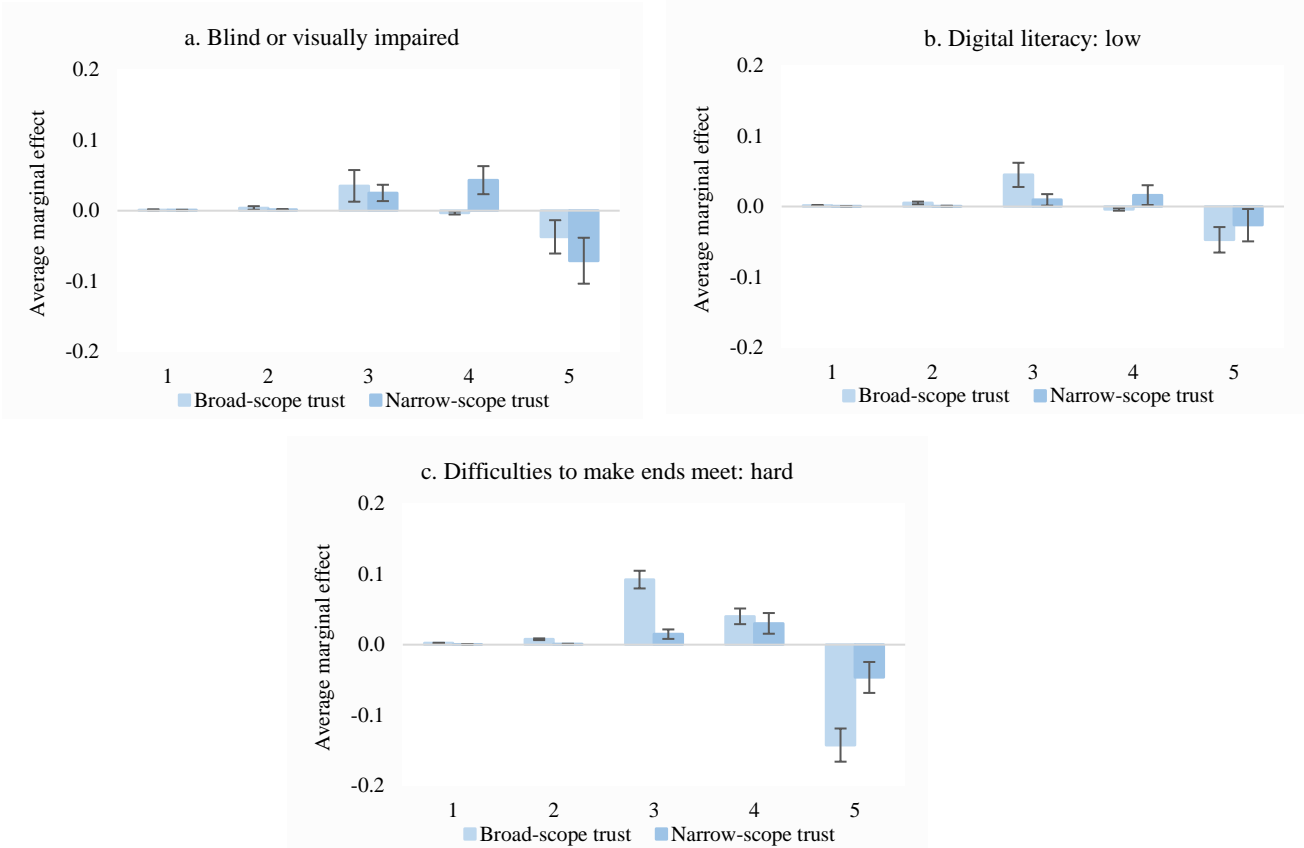
	Broad-scope trust			Narrow-scope trust		
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Physical or mental disability</b>						
Difficulty walking or wheelchair-bound	0.02*	0.02***	0.02***	0.01	0.02	0.01
	(0.009)	(0.008)	(0.008)	(0.012)	(0.012)	(0.012)
Deaf or hearing impaired	0.00	-0.01*	-0.01*	0.00	-0.01	-0.01
	(0.008)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

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 (Figure 3a), people with a low self-assessed digital literacy (Figure 3b), and people who find it hard to make ends meet (Figure 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.

**Figure 3. Average marginal effects for three groups at risk**



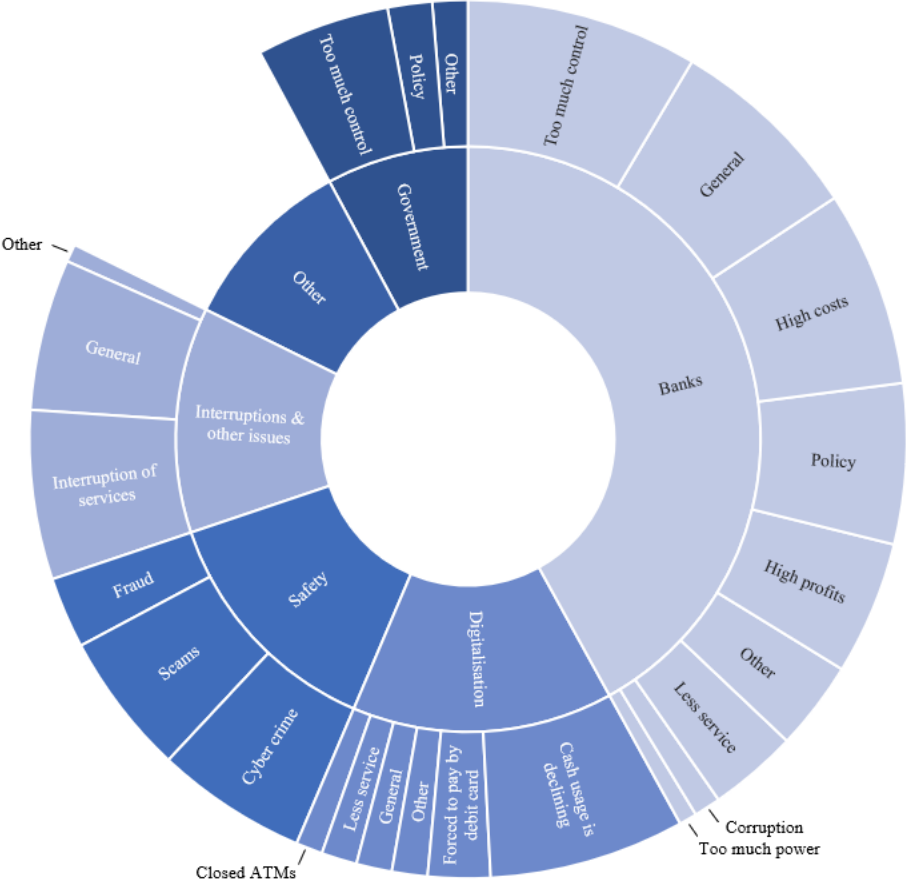
*Note:* The figures include 95% confidence intervals. The x-axis in the figures represents the five categories for broad- and narrow-scope trust. For broad-scope trust these categories are 1 ‘very little trust’, 2 ‘little trust’, 3 ‘neutral’, 4 ‘much trust’ and 5 ‘very much trust’. For narrow-scope trust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

**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.

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 Figure 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.

**Figure 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.

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 and in several instances people 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 last two 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 measures for 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 getting by* variables are replaced by *debt*

*restructuring*, which takes a value of 1 if the respondent is enrolled in a personal 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 the month and weekday effect, 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. While prior research has highlighted that individuals grappling with the complexities of digital payments are more inclined to emphasize their reliance on cash transactions (van der Crujssen and Reijerink, 2023), 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 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. 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. Moreover, 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.

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## 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 4. Nee, overwegend niet 5. Nee, in het geheel niet	Do you trust <bank name>'s ability to process your payment adequately?	1. Yes, completely 2. Yes, mostly 3. Neutral 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 Table 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
<b>Physical or mental disability</b>							
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
<b>Digital literacy</b>							
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 <sup>1</sup>	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
<b>Difficulties making ends meet</b>							
Very easy <sup>1</sup>	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 Table 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. <sup>[1]</sup> 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 <sup>1</sup>	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

(continued on next page)

**Table B.3. Descriptive statistics of the control variables (continued)**

Variable	Type	Description	Mean	St. dev.	Min	Max	N
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 <sup>1</sup>	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 <sup>1</sup>	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 <sup>1</sup>	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	Continuous	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 <sup>1</sup>	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 Table 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. <sup>[1]</sup> 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)
<b>Physical or mental disability</b>						
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)
<b>Digital literacy</b>						
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)
<b>Difficulties making ends meet<sup>1</sup></b>						
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 $\chi^2$	5472.8***	5574.7***	5473.5***	6990.5***	6989.2***	6986.4***
Pseudo R <sup>2</sup>	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. <sup>[1]</sup> 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)
<b>Physical or mental disability</b>				
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)
<b>Digital literacy</b>				
Low	-0.33*** (0.065)	-0.38*** (0.075)	-0.16** (0.072)	-0.13 (0.083)
<b>Difficulties making ends meet<sup>1</sup></b>				
Easy	-0.47*** (0.039)		-0.19*** (0.050)	
Neither hard, nor easy	-0.82*** (0.044)		-0.34*** (0.053)	
Hard	-0.82*** (0.063)		-0.29*** (0.073)	
Very hard	-1.03*** (0.138)		-0.17 (0.131)	
Debt restructuring		-0.15 (0.172)		-0.07 (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 $\chi^2$	5472.8***	3496.2***	6990.5***	4646.7***
Pseudo R <sup>2</sup>	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. <sup>[1]</sup> 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)
<b>Physical or mental disability</b>						
Difficulty walking or wheelchair-bound	0.16*** (0.059)	0.17*** (0.059)	0.16*** (0.059)	0.09 (0.071)	0.10 (0.071)	0.09 (0.071)
Deaf or hearing impaired	-0.10* (0.053)	-0.10* (0.053)	-0.10* (0.053)	-0.05 (0.067)	-0.05 (0.068)	-0.05 (0.067)
Blind or visually impaired	-0.26*** (0.085)	-0.27*** (0.085)	-0.26*** (0.084)	-0.43*** (0.102)	-0.45*** (0.102)	-0.44*** (0.102)
Limited or no hand function	-0.21*** (0.083)	-0.22** (0.084)	-0.21** (0.084)	-0.03 (0.105)	-0.02 (0.105)	-0.02 (0.105)
Mild intellectual disability	-0.04 (0.209)	-0.04 (0.209)	-0.04 (0.209)	0.25 (0.212)	0.27 (0.214)	0.25 (0.213)
<b>Digital literacy</b>						
Low	-0.33*** (0.065)	-0.34*** (0.065)	-0.33*** (0.065)	-0.16** (0.072)	-0.17** (0.072)	-0.16** (0.072)
<b>Difficulties making ends meet<sup>1</sup></b>						
Easy	-0.47*** (0.039)	-0.47*** (0.039)	-0.47*** (0.039)	-0.19*** (0.050)	-0.19*** (0.050)	-0.19*** (0.050)
Neither hard, nor easy	-0.82*** (0.044)	-0.82*** (0.044)	-0.82*** (0.044)	-0.34*** (0.053)	-0.34*** (0.053)	-0.34*** (0.053)
Hard	-0.82*** (0.063)	-0.82*** (0.063)	-0.81*** (0.063)	-0.29*** (0.073)	-0.30*** (0.073)	-0.29*** (0.073)
Very hard	-1.03*** (0.138)	-1.03*** (0.138)	-1.03*** (0.138)	-0.17 (0.131)	-0.17 (0.131)	-0.16 (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
$\chi^2$	5472.8***	5572.1***	5444.3***	6990.5***	7090.1***	7005.9***
Pseudo R <sup>2</sup>	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. <sup>[1]</sup> 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	First	All	First
	observations	observations	observations	observations
<b>Physical or mental disability</b>				
Difficulty walking or wheelchair-bound	0.16*** (0.059)	0.10* (0.061)	0.09 (0.071)	0.08 (0.076)
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)
<b>Digital literacy</b>				
Low	-0.33*** (0.065)	-0.38*** (0.070)	-0.16** (0.072)	-0.19** (0.080)
<b>Difficulties making ends meet<sup>1</sup></b>				
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 $\chi^2$	5472.8***	4728.21***	6990.5***	5517.9***
Pseudo R <sup>2</sup>	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. <sup>[1]</sup> The reference category is *difficulties making ends meet: very easy*.

DeNederlandscheBank

EUROSYSTEEM

De Nederlandsche Bank N.V.  
Postbus 98, 1000 AB Amsterdam  
020 524 91 11  
dnb.nl