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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

Financial knowledge and trust in financial institutions*

Carin van der Cruijssen^{a*}, Jakob de Haan^{a, b, c} and Ria Roerink^a

^a *De Nederlandsche Bank (DNB), The Netherlands*

^b *University of Groningen, The Netherlands*

^c *CESifo, Munich, Germany*

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Abstract

Using fourteen years of data on Dutch consumers' trust in financial institutions, we find that financially literate consumers are more likely to trust banks, insurance companies and pension funds, and the competence and integrity of the managers of these institutions. This holds both for broad-scope and narrow-scope trust. Although trust in respondents' own financial institutions is significantly higher than general trust in financial institutions, both forms of trust are positively related. Financially knowledgeable people are more likely to trust the prudential supervisor. Finally, our results indicate that trust in the supervisor is positively related to trust in the financial sector.

Keywords: trust, financial institutions, financial literacy, consumer survey.

JEL classifications: D12, D83, E58, G21, G22.

* Corresponding author. Email: c.a.b.van.der.cruijssen@dnb.nl. We are grateful to CentERdata for collecting the data. The views expressed in this paper do not necessarily reflect the views of DNB or those of the Eurosystem.

1. Introduction

Ten years after the financial crisis, Americans' trust in financial institutions is on the rise, increasing from 22 percent in 2008 to 28 percent in 2018 (Sapienza and Zingales, 2018).¹ Trust in the financial sector may be defined as consumers' expectation that financial institutions are generally dependable and can be relied on to deliver on their promises (Sirdeshmukh et al., 2002). With a high level of trust, customers feel confident that their interests are well served by the financial institution (van Esterik-Plasmeijer and van Raaij, 2017). This is important as financial products are generally imperfectly understood by consumers, particularly because financial products often contain promises about delivering returns far into the future (Jaffer et al., 2014).

Low trust in the financial sector has several potential consequences. First, it may undermine financial stability (Guiso, 2010). In the worst case, it may even lead to bank runs.² Low trust may also damage the financial services industry. If the industry is not trusted, then clients 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). Using survey data from ten Central, Eastern and Southeastern European countries, Stix (2013) reports, for instance, that distrusting people are less likely to have a savings account than trusting people and have stronger liquidity preferences. Finally, low trust may also hurt individual financial institutions as it will make customers less loyal. A loyal customer base contributes to the continuity of financial institutions and less money needs to be spend on attracting new customers (van Esterik-Plasmeijer and van Raaij, 2017). Ampudia and Palligkinis (2018) report, for instance, that Italian households which do not trust the banking sector are less likely to hold a bank account and households are more likely to switch to a new bank if they do not trust their own bank.

This paper analyzes trust in different types of financial institutions in the Netherlands, based on a longitudinal survey. Whereas most previous research (discussed in more detail in section 2), examines one type of financial institution (mostly banks), we analyze trust in multiple types of financial institutions: banks, insurance companies and pension funds. Here we are able to distinguish between trust in respondents' own bank (or insurance company or pension fund) and trust in banks (or insurance companies or pension funds) in general. This is important as previous literature suggests that many customers seem to believe that their own bank is an

¹ Several studies report a decline of trust in banks after the outbreak of the financial crisis (Guiso, 2010; Sapienza and Zingales, 2012; Knell and Stix, 2015). Stevenson and Wolfers (2011) find a significant negative link between the unemployment rate and trust in banks. Personal crisis experiences resulted in a drop of trust in banks in the Netherlands (van der Crujssen et al., 2016).

² It has been observed that even though people say they don't trust the banks, their behavior suggests otherwise as they neither run nor switch banks frequently. However, the absence of runs probably reflects that protections are in place (like deposit insurance schemes) that make that bank clients feel that their money is safe. Reasons provided for limited switching are that people find it too much of a hassle to change banks, find it a difficult decision to make and are afraid of making mistakes (van der Crujssen and Diepstraten, 2017), resulting in behavioral loyalty (Dick and Basu, 1994).

exception to the rule that banks cannot be trusted (van Esterik-Plasmeijer and van Raaij, 2017).³ We also examine trust in the integrity and competence of the managers of financial institutions. Several previous studies suggest that these two factors are related to trust in institutions (Pirson and Malhotra, 2008; van Esterik-Plasmeijer and van Raaij, 2017).⁴ Finally, we analyze trust in the financial sector supervisor. Trust in the supervisor has received limited attention in the literature. An exception is the study by van der Crujisen et al. (2016), who report that personal financial crisis experiences do not have a significant direct effect on trust in the banking supervisor. We hypothesize that trust in the financial sector supervisor enhances trust in the financial sector.

We focus on the role of financial literacy, asking whether more financially educated respondents have more trust in financial institutions in general, their own financial institutions and the supervisor. There is an extensive literature on financial literacy (see Lusardi and Mitchell (2014) for a survey). This literature shows that financially literate people make better financial decisions. For example, they get higher interest rates on their savings accounts (Deuflhard et al., 2019), are more likely to have stocks (van Rooij et al., 2011) and have better diversified portfolios (Von Gaudecker, 2015).⁵ However, little is known on the importance of financial knowledge for trust in financial institutions and the financial sector supervisor. The paper that comes closest to our work is Hansen (2012), who examines the relationship between financial literacy and trust in Danish pension funds and mortgage companies. He finds that consumer knowledge positively influences broad-scope trust (i.e. trust in financial institutions in general) and narrow-scope trust (i.e. trust in someone's own financial institution).⁶ We hypothesize that respondents with good financial knowledge have more trust in their own financial institutions, financial institutions in general and their supervisor. We test this for banks, pension funds and insurance companies.

Our main findings are that, compared to financially illiterate people, financially literate people are more likely to trust financial institutions, their managers, and their supervisor. This holds no matter how we measure financial literacy: based on people's self-assessed financial knowledge, being in charge of household finances or working in the financial sector. We also find that people with a higher degree of trust in the financial health of financial institutions in general (broad-scope trust) are also more likely to trust the financial institutions they are customer of (narrow-scope trust). For all types of financial institutions researched, we find that although the

³ As pointed out by van Esterik-Plasmeijer and van Raaij (2017), customers probably purposefully 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.

⁴ van Esterik-Plasmeijer and van Raaij (2017) argue that being competent is not enough to be trusted. They define integrity as honesty of employees, fairness in rules, procedures and conditions, and an equal and fair treatment of customers.

⁵ The literature is inconclusive with respect to the effect of financial literacy on bank switching behavior. Brown et al. (2017) and Diepstraten and van der Crujisen (2019) find that financially literate people are more likely to switch than other consumers, whereas Brunetti et al. (2016) find the opposite.

⁶ In line with these findings, van der Crujisen and Jonker (2019) report a positive relationship between self-assessed financial knowledge and pensioners' trust in their own pension funds.

latter type of trust is always higher, broad-scope and narrow scope trust are positively related. For all types of institutions, we also find a positive relationship between trust in other people and narrow-scope trust. Furthermore, people with high narrow-scope or broad-scope trust are more likely to trust the integrity and competence of managers of financial institutions than people with low trust in financial institutions. Our results also indicate that trust in the supervisor is positively related to trust in the financial sector. Finally, our findings show that various relationships with sociodemographic variables depend on the type of trust. For example, compared to young people, old people are relatively likely to trust their pension funds but unlikely to trust their banks and life insurance company.

The paper is structured as follows. Section 2 reviews previous studies and formulates our hypotheses. Section 3 describes our data on trust. Section 4 explains the regression method and section 5 presents the results. Section 6 provides conclusions and policy implications.

2. Previous studies and hypotheses

Most studies on trust in financial institutions are single-country studies and focus on banks.⁷ For example, Carbó-Valverde et al. (2013) analyze the drivers of trust in Spanish banks in 2009 and find that it is mainly affected by bank customers' perceived performance of banks, such as their sensitivity to bank customers' problems. Likewise, Jansen et al. (2015) examine which factors may trigger a decline in trust in banks among Dutch consumers by presenting survey respondents with eight hypothetical scenarios related to the financial crisis and asking to what extent these events would harm trust in their banks. A key factor is high executive compensations but other factors such as negative media reports, falling stock prices, and opaque product information can trigger trust loss too. In addition, van der Crujisen (2019) reports that the commercial usage of payments data can trigger a decline of consumers' trust in their bank.

A few studies employ cross-country data. For instance, Fungáčová et al. (2019) use data on trust in banks from the World Values Survey (WVS) 2010-2014 for 52 countries. They find large differences in trust and show that the level of trust depends on sociodemographic indicators. Females have more trust than males and trust is positively related to income, access to television, being religious, and the holding of pro-market economic views, but is negatively related to education, age and internet access.

Several types of trust have been examined in the literature. Following previous studies (Hansen, 2012; van Esterik-Plasmeijer and van Raaij, 2017), we distinguish between three types

⁷ A few studies focus on trust in Dutch pension funds. van der Crujisen and Jonker (2019) find that trust in the pension fund's ability to pay pension benefits at all times depends on consumers' perceived pension funds' performance and personal characteristics. van Dalen and Henkens (2018) analyze trust in three types of pension providers: pension funds, banks and insurance companies. Pension funds are trusted most. Trust is positively related to someone's level of education and depends inter alia on the perceived integrity and competence of the pension providers.

of trust: generalized trust, narrow-scope trust and broad-scope trust. Generalized trust (sometimes also called person trust) refers to trust in other people with whom there is no direct relationship. Most studies on generalized trust focus on cross-country comparisons and measure generalized trust as the share of a population answering yes to the following question from the WVS: 'In general, do you think that most people can be trusted, or can't you be too careful in dealing with people?' (see, for instance, Aghion et al. 2010). In our survey (described in more detail in the next section) we use a similar question.

Generalized trust matters for financial decision making at the individual level. For example, people who trust others are more likely to be enrolled in pension plans (Agnew et al., 2007), to become an entrepreneur (Guiso et al., 2006), to participate in the stock market (Balloch et al., 2015), and less likely to default on household debt (Jiang and Lim, 2018). However, there is also research indicating that trust in others can be too high. For instance, Butler et al. (2016) find that when trust very high, people get cheated often and incur large losses.

Following Sirdeshmukh et al. (2002), narrow-scope trust can be defined as consumers' expectation that a specific financial institution is dependable and can be relied on to deliver on its promises. Sometimes this concept is referred to as institution trust (van Esterik-Plasmeijer and van Raaij, 2017). In our research, this concept refers to trust in the health of the bank (or insurance company or pension fund) of the respondent. Broad-scope trust (sometimes also referred to as system trust) is defined as the expectation held by consumers that a group of financial institutions (banks or insurance companies or pension funds) is generally dependable and can be relied on to deliver on their promises (Hansen, 2012). In our research it is measured as trust in the financial health of banks (or pension funds or insurance companies) in general.

We start by formulating our hypotheses about the relationship between the three types of trust. First, we follow van Esterik-Plasmeijer and van Raaij (2017) who argue that the Netherlands has a high level of generalized trust. This is confirmed by data on generalized trust from wave six of the WVS (Inglehart et al., 2014). For example, 66% of the Dutch respondents believe that most others can be trusted, whereas this figure is 35% for US respondents. People usually get information about financial institutions from the mass media, which often report on incidents in the financial sector in a negative way. In contrast, information about a specific bank, insurance company or pension fund is usually obtained from personal experience with this financial institution. Personal experiences and satisfaction with customers' own financial institution are often positive (van Esterik-Plasmeijer and van Raaij, 2017). Due to the financial crisis and several scandals, trust in financial institutions (broad-scope trust) decreased, and is expected to be lower than narrow-scope trust. Thus, the first two hypotheses are:

H1. Generalized trust is higher than narrow-scope trust.

H2. Narrow-scope trust is higher than broad-scope trust.

van Esterik-Plasmeijer and van Raaij (2017) report support for these hypotheses using a representative sample of 1,079 respondents of 18 years and older from an online consumer panel in the Netherlands. In contrast to the study by van Esterik-Plasmeijer and van Raaij (2017), our study is based on longitudinal data, which therefore captures economic good times and bad times. Furthermore, we test these hypotheses not only for banks, but also for insurance companies and pension funds.

As generalized trust may be related to narrow-scope trust as discussed above, we hypothesize that:

H3. Generalized trust has a positive relationship with narrow-scope trust.

Broad-scope and narrow-scope trust are not independent of each other. Positive personal experiences, satisfaction, and trust with regard to a specific financial institution may be generalized to broad-scope trust, assuming that these institutions are not that different from each other after all. This reasoning suggests that there is a positive relationship between broad-scope and narrow-scope trust. However, van Esterik-Plasmeijer and van Raaij (2017) argue that there may be a negative relationship between broad-scope trust and narrow-scope trust. If broad-scope trust is low, financial institutions may compensate for this by developing narrow-scope trust. Based on this reasoning we formulate the following hypotheses:

H4a. Broad-scope trust has a positive relationship with narrow-scope trust.

H4b. Broad-scope trust has a negative relationship with narrow-scope trust.

van Esterik-Plasmeijer and van Raaij (2017) find that broad-scope trust is strongly and positively related to narrow-scope trust. Hansen (2012) also reports support for Hypothesis 3a, based on surveys among clients of Danish mortgage and pension companies.

In our survey we also asked respondents for their view on the competence and integrity of managers of financial institutions. Competence pertains to several areas of knowledge of managers of financial institutions and their experience as perceived by customers. Integrity can be described as the fairness, morality, and honesty of the managers of financial institutions as perceived by customers. Following van Esterik-Plasmeijer and van Raaij (2017), who find support for these hypotheses, we hypothesize that:

H5a. Trust in the competence and integrity of financial sector managers has a positive relationship with narrow-scope trust.

H5b. Trust in the competence and integrity of financial sector managers has a positive relationship with broad-scope trust.

The relationship between trust in the supervisor and trust in financial institutions has, to the best of our knowledge, never been investigated. This is rather surprising in view of the fact that strengthening trust in the financial sector is an important objective in the mission statements of many supervisory agencies. Supervisory authorities are aiming to make financial institutions

safer and the financial system more stable and resilient. If the public trust that the supervisory authorities can deliver on these objectives, their trust in the financial sector may also be higher. We therefore hypothesize:

H6. Trust in the financial sector supervisor is positively related to broad-scope trust.

Finally, we turn to the role of financial literacy. Past research suggests that knowledgeable consumers acquire and retain more information than less knowledgeable consumers (see Hansen (2012) for a discussion of this literature). Knowledgeable consumers may be more able to detect the limitations of a financial service provider, thus decreasing trust. However, financial knowledge is likely to make consumers more aware of what financial service providers do and this may lead to more trust. Indeed, van der Crujisen and Jonker (2019) report that trust in pensions is higher among pensioners who self-assess to be more or less knowledgeable with respect to financial matters than for pensioners who consider themselves not knowledgeable. Hansen (2012) also reports that consumer knowledge positively influences narrow- and broad-scope trust. We therefore expect that:

H7. Financial knowledge has a positive relationship with broad-scope trust.

H8. Financial knowledge has a positive relationship with narrow-scope trust.

For similar reasons, better financial knowledge may affect trust in financial sector managers and the financial sector supervisor. We therefore hypothesize:

H9. Financial knowledge has a positive relationship with trust in the competence and integrity of financial sector managers.

H10. Financial knowledge has a positive relationship with trust in the financial sector supervisor.

Finally, we test a hypothesis put forward by Hansen (2012) who argues that when broad-scope trust is low, consumers will rely more on their financial knowledge in determining the trustworthiness of their own financial service provider than when broad-scope trust is high. In other words:

H11. Financial knowledge has a greater positive effect on narrow-scope trust when broad-scope trust is low than when broad-scope trust is high.

Hansen (2012) finds some weak evidence that broad-scope trust negatively moderates the relationship between consumers' financial knowledge and narrow-scope trust. This implies that financial knowledge has a greater positive effect on narrow-scope trust when broad-scope trust is low rather than high.

2. Data on trust

2.1 DNB Trust Survey and DNB Household Survey

Each year, De Nederlandsche Bank (DNB) collects detailed data on consumers' trust in the financial sector via the DNB Trust Survey (DTS). The DTS is held among the CentERpanel, a representative sample of the Dutch-speaking population in the Netherlands.⁸ This internet-based panel consists of approximately 2,000 households. All family members aged 16 and above in the panel are invited to complete the DTS. The DTS includes a question to measure trust in DNB (DNB is responsible for supervising banks, pension funds and insurance companies), and also a question on trust in other people (generalized trust). Moreover, it includes questions that zoom in on trust in the financial health of various types of financial institutions, and the perceived competence and integrity of the managers of these institutions. Many of the questions have been part of the DTS since its start and have remained unchanged. We use data from 2006 until 2019.⁹ This enables us to track the evolvement of trust. An important advantage of our data is that it can easily be linked to data on personal characteristics and financial knowledge. This information is captured by the annual DNB Household Survey (DHS), which is also filled-in by members of the CentERpanel. The DHS exists already since 1993 and has been extensively used by researchers and policymakers because it covers a wide range of topics.¹⁰ Prior research has shown that usage of the DTS can result in valuable new insights (Mosch and Prast, 2008; Jansen et al., 2015; van der Cruijssen et al., 2016; Diepstraten and van der Cruijssen, 2019; van der Cruijssen et al., 2019; van der Cruijssen, 2019).

2.2 Generalized trust, trust in the banking supervisor, and trust in the financial sector

Generalized trust is elicited by asking 'Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?'. This question is very similar to the generalized trust question in the WVS and the US General Social Survey. Respondents choose between 'people can be trusted' and 'one cannot be careful enough'. In 2019, 63% of the respondents think that, in general, most people can be trusted (Figure 1). The share of respondents with trust in other people was the lowest in 2006 (60%) and the highest in 2011 (70%). Over the entire sample, the share of respondents with trust in other people was 65%. In regressions we include the dummy *generalized trust*, which is one if people answer that most people can be trusted and which is zero otherwise.

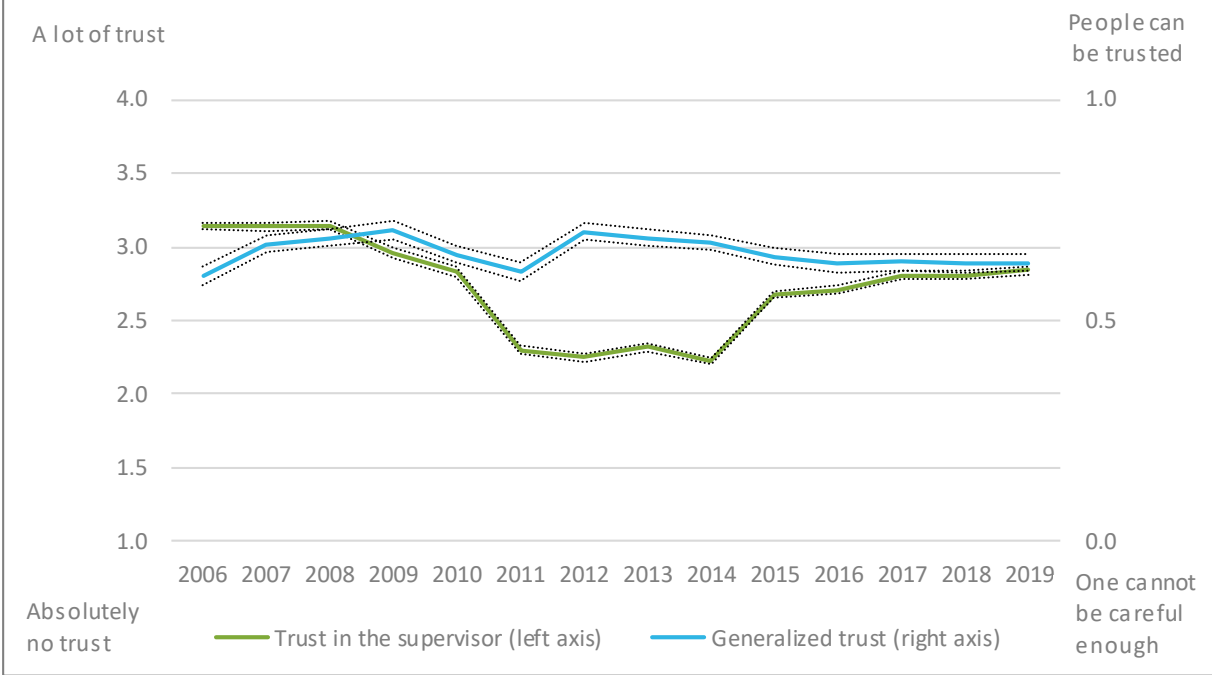
⁸ The CentERpanel is managed by CentERdata, a research institute affiliated with Tilburg University. For more information on this panel we refer to Teppa and Vis (2012).

⁹ Two more general measures of trust in the financial sector are part of our survey data but only since 2019. These measures are used in our robustness analysis.

¹⁰ A list with publications using data collected among the CentERpanel is available on <https://www.centerdata.nl/en/publications>. See <http://www.centerdata.nl/en/projects-by-centerdata/dnb-household-survey-dhs> for more information on the DHS. URLs have been last accessed on November 28, 2019.

Trust in the supervisor is an ordered variable capturing trust in DNB. It ranges from 1 (absolutely no trust) to 4 (a lot of trust). Figure 1 shows that trust in the supervisor declined sharply during the financial crisis and has not completely recovered yet. In 2019, trust in the supervisor was 2.8 on average.

Figure 1. Trust in the supervisor (DNB) and generalized trust



Source: DTS.
 Note: The figure reports average levels of trust with 95% confidence intervals.

The DTS includes questions to measure trust in the financial soundness of three types of financial institutions: banks, insurance companies and pension funds. People are asked whether they trust, at all times, banks to repay their deposits, insurance companies to pay insurance money and pension funds to pay pension benefits. The questions asked refer to financial institutions in general (broad-scope trust measures) and to the respondents’ own financial institutions (narrow-scope trust measures).

Narrow-scope trust in banks measures the trust in one’s own bank(s) capacity to repay one’s deposits at all times. *Broad-scope trust in banks* measures trust in the ability to repay of all banks in the Netherlands. *Narrow-scope trust in life insurance company* captures trust in one’s own life insurance company that it pays for insurance at all times. *Broad-scope trust in insurance companies* measures trust in the fulfilment of payment obligations to all persons by all type of insurance companies, also at all times. In a similar way *narrow-scope trust in pension funds* and *broad-scope trust in pension funds* measure trust in pension funds’ ability to pay pension benefits at all times, either one’s own pension benefit (the first variable) or all pension benefits (the second variable).

Narrow-scope trust: average is the average of the narrow-scope trust measures for the different types of institutions. For each respondent this average is based on the available narrow-scope trust measures, so at most three. For example, if we only have narrow-scope trust in banks and narrow-scope trust in pension funds for a respondent, narrow-scope trust: average is simply the average of these two measures. *Broad-scope trust: average* is the average of the broad-scope trust measures and constructed in a similar way as narrow-scope trust: average.

Nowadays, trust in the health of financial institutions is lower than fourteen years ago (Figure 2). It declined during the financial crisis and has not fully recovered yet. Trust in different types of financial institutions is on average between 3 (neutral) and 4 (yes, predominantly).

The 2006-2019 average trust in the financial health of one's own bank was 4.0. This is significantly higher than the average narrow-scope trust in pension funds, which was 3.7 (t-statistic: 46.9). Narrow-scope trust in life insurance companies was 3.9, so also higher than narrow-scope trust in pension funds (t-statistic: 26.8). We observe higher trust in life insurance companies for each year, except for 2019 (when there is no significant difference).

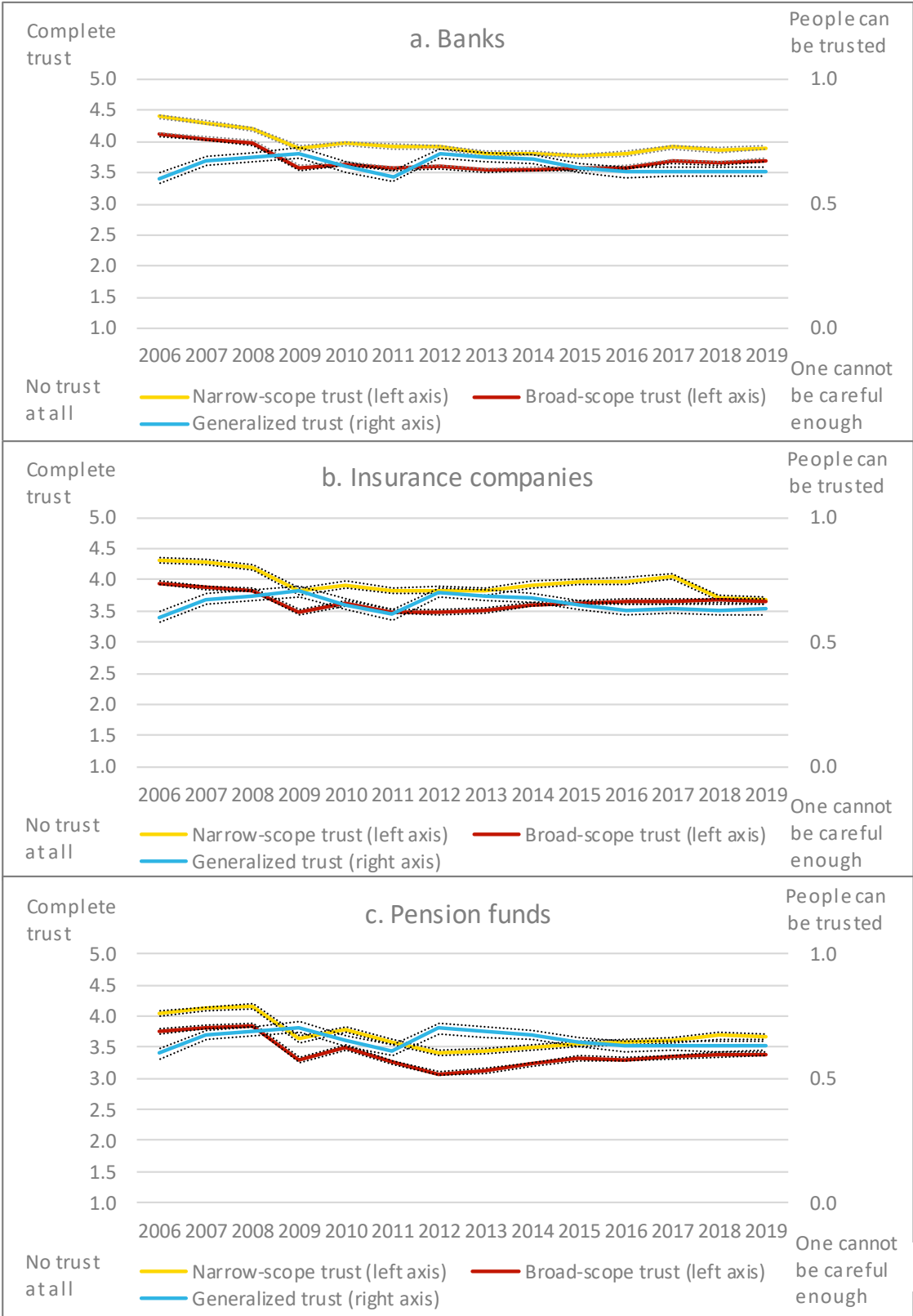
Average broad-scope trust in banks was also higher than average broad-scope trust in pension funds: 3.7 versus 3.4 (t-statistic: 56.5). Insurance companies could also count on more broad-scope trust than pension funds (t-statistic: 47.5). Only in 2008 there was no significant difference. On average, broad-scope trust in insurance companies was 3.6. Although on average broad-scope trust in banks is somewhat higher than trust in insurance companies, the difference is only 0.1 (t-statistic: 10.6).

The data underlying Figure 2 allow us to test H1. Table 1 shows the results of paired t-tests. The figures for average generalized trust differ in the columns due to differences in the number of respondents answering the questions on generalized trust and narrow-scope trust for different types of financial institutions. For banks and life insurance companies we reject H1: generalized trust is lower than narrow-scope trust.¹¹ In contrast, for pension funds we find support for H1.

We also test for differences between generalized trust and narrow-scope trust for each year in the sample. The findings support our prior findings for banks but these tests yield mixed outcomes in case of life insurances and pension funds (see Appendix B, Table B.1).

¹¹ Note that we had to construct a somewhat different measure for generalized trust to simplify the comparison with the narrow-scope trust measures (which run from 1 to 5). In Table 1, *generalized trust 2* is 1 if generalized trust is 0 and it is 5 if generalized trust is 1.

Figure 2. Trust in the financial health of financial institutions and generalized trust



Source: DTS.

Note: The figures report average levels of trust with 95% confidence intervals. From 2006-2016 all respondents answered the question about broad-scope trust in insurance companies, whereas in 2018 and 2019 the question was only answered by respondents with a life insurance.

Table 1. The difference between generalized trust and narrow-scope trust

	Banks	Life insurance company	Pension funds
(a) Generalized trust 2	3.64	3.67	3.74
(b) Narrow-scope trust	3.95	3.92	3.68
(a) - (b)	-0.32***	-0.25***	0.06***
T-statistic	-28.86	-15.05	4.92
Number of observations	30,660	13,219	22,382

Note: *** denotes statistical significance at the 0.01 level (one-sided paired t-test). Period: 2006-2019.

In general, trust in the financial health of the own institution is higher than trust in the health of financial institutions in general (Figure 2 and Table 2). This provides support for H2. The t-statistics for the difference between broad-scope and narrow scope trust over the entire sample period are 70.5 for banks, 32.6 for insurance companies and 53.5 for pension funds. We also find support for H2 when we test the difference for each year separately (Appendix B, Table B.2).

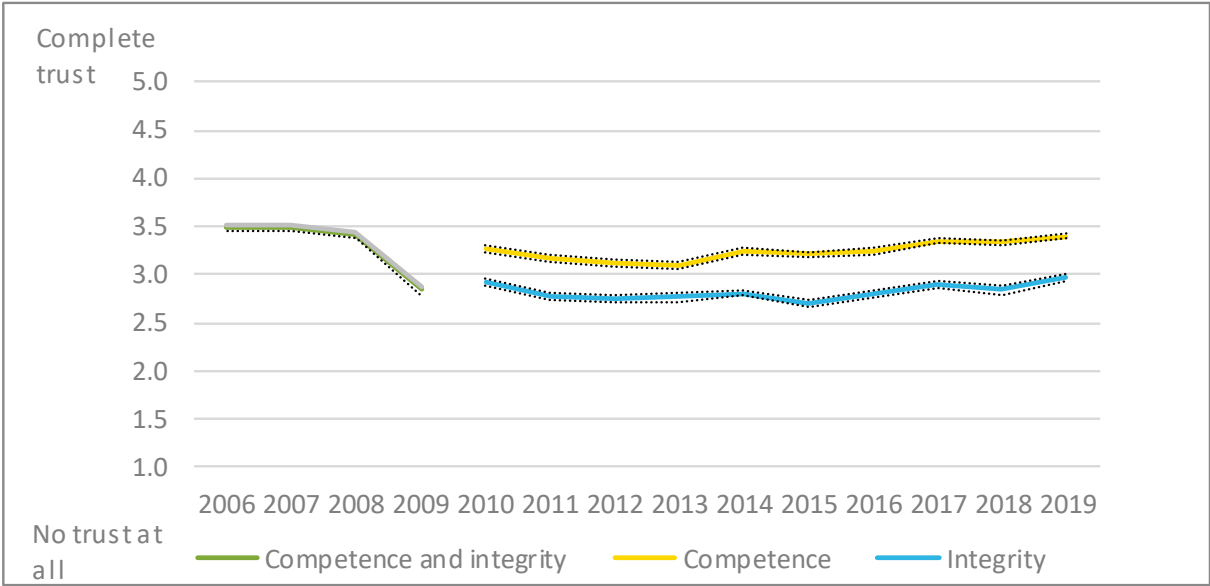
Table 2. The difference between narrow-scope trust and broad-scope trust

	Banks	(Life) insurance companies ^a	Pension funds
(a) Narrow-scope trust	3.96	3.93	3.68
(b) Broad-scope trust	3.70	3.76	3.46
(a) - (b)	0.26***	0.17***	0.22***
T-statistic	70.54	32.64	53.48
Number of observations	30,358	13,093	22,213

Note: *** denotes statistical significance at the 0.01 level (one-sided paired t-test). Period: 2006-2019. ^a Narrow-scope trust is trust in one's own life insurance company, whereas broad-scope trust captures general trust in all insurance companies.

Figure 3 shows trust in the competence and integrity of managers of financial institutions, which is measured separately as of 2010. *Trust in managers' competence and integrity* measures to what extent respondents agree with the statement: 'Managers of financial institutions are in general knowledgeable and sound'. This ordered variable ranges from 1 (completely disagree) to 5 (completely agree). *Trust in managers' competence* and *trust in managers' integrity* are built in a similar fashion but only focus on one of the two characteristics of managers. On average trust in the competence is 3.2 and trust in the integrity is 2.8, so 0.4 lower (t-statistic: 80.4). In 2019, 23% of the respondents disagreed or strongly disagreed with the statement that managers of financial institutions are integer, 25% (strongly) agreed, 44% took a neutral stance and 9% did not know what to answer. Regarding competence, 10% think managers are incompetent, 46% perceive them as competent, 34% have a neutral standpoint and 9% did not report an opinion.

Figure 3. Trust in the competence and integrity of managers of financial institutions



Source: DTS.
 Note: The figure reports average levels of trust with 95% confidence intervals.

3. Regression method

We run various regressions to test our other hypotheses. In this section we explain the construction of the variables included in these models (apart from the trust variables as discussed in section 2) and the models themselves.

3.1 Financial knowledge

Financial knowledge captures self-assessed knowledge of financial matters and can take four different values: 1 = not knowledgeable, 2 = more or less knowledgeable, 3 = knowledgeable, or 4 = very knowledgeable. Unfortunately, 2019 data on self-assessed knowledge of financial matters is not available. Therefore, we take the most recent available data, assuming that the self-assessment did not change. Van Rooij et al. (2011) show a very strong link between a self-reported financial knowledge measure and literacy measures based on knowledge questions.

3.2 Control variables

We include a wide range of control variables. *Male* is a binary dummy that is 1 for males and 0 for females. Four binary *age dummies* capture the age of the respondent: between 35 and 44, between 45 and 54, between 55 and 64, 65 and over. For example, between 35 and 44 is 1 for respondents between 35 and 44 and 0 for respondents younger than 35 or older than 44. Respondents of 34 years and below are in the reference category. *Education: bachelor or higher* is 1 for respondents who successfully completed higher vocational or university education and 0 for lower-educated respondents. Three binary *income dummies* are constructed to control for differences in the

household net monthly income: income: EUR 1151-1800, income: EUR 1801-2600, income: > EUR 2600. The dummies are 1 for respondents with the particular income and 0 for respondents with another level of income. Respondents in the reference category have an income of EUR 1150 or below. We also control for having a job: the binary dummy *job* is 1 for respondents who have a paid job, work in family business or are self-employed and 0 for other respondents. *Homeowner* is included as a proxy for wealth. This variable is 1 for homeowners and 0 else. If the household head lives together with a partner the variable *household head lives with partner* is 1 and otherwise it is 0. *Degree of urbanization* ranges from 1 (the address density of the respondent's residence is 500 per km² or less) to 5 (address density of more than 2500 per km²). We also control for the *region* people live in by including the binary region dummies north, east, and south. These variables are 1 for respondents who live in the mentioned region and 0 else. Respondents who live in the west of the Netherlands are in the reference group. Last, we include *risk aversion*. It is the average agreement measured on a 1 (totally disagree) to 7 (totally agree) scale with six statements on risk taking. For example, the statement 'I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns'.

In addition, we control for personal crisis experiences. In line with van der Crujisen et al. (2016) we use the 2010 and 2013 DTS information on personal crisis experiences. The March 2010 DTS included a couple of questions on personal crisis experiences. These questions measure whether respondents had savings at one of the banks that either received government support or went bankrupt in 2008/2009. The March 2013 DTS included questions on respondents' crisis experiences with respect to the nationalization of SNS Reaal in 2013. It was asked whether respondents had savings at one of the banks that were part of SNS Reaal (ASN Bank, SNS Bank, and/or RegioBank). We use this information to construct two binary dummy variables: year after bankruptcy and year after bailout. *Year after bankruptcy* is 1 in the year after a bankruptcy for customers who experienced that their bank went bankrupt in the prior year. So, it is 1 in 2009 for respondents who had savings at Icesave in 2008 and it is 1 in 2010 for respondents who had savings at DSB in 2009. *Year after bailout* is 1 in 2009 for respondents who were customer of a bank that was bailed out in 2008 and 1 in 2013 for respondents who were customer of ASN Bank, SNS Bank, and/or RegioBank. In all other cases it is 0. Table A.1 in Appendix A provides more detailed information on the variable construction and the descriptive statistics of all variables used.

3.3 Models

We estimate several panel models. As all dependent variables are ordered variables, we estimate random-effects ordered logistic regressions. First, we estimate a model with broad-scope trust_{i,t}

as dependent variable (model 1a). This model enables us to test whether there is a positive link between financial knowledge_{i,t} and broad-scope trust_{i,f,t} (H7). We run the model for each type of financial institution separately.

$$\text{broad-scope trust}_{i,f,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}) + u_i + e_{i,t} \quad (1a)$$

In this and all subsequent equations f denotes the type of financial institution (either banks, insurance companies or pension funds), i indicates the individual, and t refers to time. Financial knowledge_{i,t} is the self-assessed financial knowledge and the key explanatory variable (but, as explained in more detail below, we also experiment with other proxies for financial knowledge). The vector $X_{i,t}$ captures personal characteristics. It also includes personal crisis experiences in case f =banks. The error term is composed of an idiosyncratic error $e_{i,t}$ and a household fixed component u_i which controls for unobserved heterogeneity.

Equation 1b is the same as equation 1a but with trust in the supervisor_{i,t} as additional explanatory variable. This enables us to test whether there is a positive relationship between trust in the supervisor and broad-scope trust (H6).

$$\text{broad-scope trust}_{i,f,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}, \text{trust in the supervisor}_{i,t}) + u_i + e_{i,t} \quad (1b)$$

Next, we run a model with trust in the supervisor_{i,t} as dependent variable to test whether there is a positive relationship between financial knowledge and trust in DNB (H10). We run two regressions, one without and one with the personal crisis experiences included in $X_{i,t}$.

$$\text{trust in the supervisor}_{i,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}) + u_i + e_{i,t} \quad (2)$$

Thereafter, we estimate a set of models with narrow-scope trust_{i,f,t} as dependent variable. We run models 3a, 3b and 3c for each type of financial institution separately.

$$\text{narrow-scope trust}_{i,f,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}) + u_i + e_{i,t} \quad (3a)$$

$$\text{narrow-scope trust}_{i,f,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}, \text{broad-scope trust}_{i,f,t}) + u_i + e_{i,t} \quad (3b)$$

$$\text{narrow-scope trust}_{i,f,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}, \text{broad-scope trust}_{i,f,t}, \text{financial knowledge}_{i,t} * \text{broad-scope trust}_{i,f,t}) + u_i + e_{i,t} \quad (3c)$$

Equation 3a enables us to test whether financial knowledge has a positive relationship with narrow-scope trust (H8). In case f =banks the vector $X_{i,t}$ includes personal crises experiences. In one version of this equation, the vector $X_{i,t}$ includes generalized trust (as a dummy variable),

which allows us to test H3. Equation 3b is an extended version of equation 3a (with generalized trust); broad-scope trust_{i,t} is added to test H4a and H4b. Equation 3c also includes the interaction term financial knowledge_{i,t}*broad-scope trust_{i,t} to test whether financial knowledge has a greater positive effect on narrow-scope trust when broad-scope trust is low than when broad-scope trust is high (H11).

Finally, we estimate a couple of models with trust in managers' competence and integrity_{i,t} as dependent variable using data on 2006-2009. For the period 2010-2019 we are able to estimate two sets of regressions, one with trust in managers' competence_{i,t} as dependent variable and one with trust in managers' integrity_{i,t} as dependent variable. Equation 4a is estimated to test H9: the presence of a positive link between financial knowledge and trust in the competence and integrity of managers of financial institutions. Model 4b includes narrow-scope trust: average_{i,t} to test whether there is a positive relationship between narrow-scope trust and trust in the competence and integrity of managers of financial institutions (H5a). Model 4c includes broad-scope trust: average_{i,t} instead to test H5b. In all these equations the vector X_{i,t} includes personal crises experiences.

$$\text{trust in managers' competence and integrity}_{i,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}) + u_i + e_{i,t} \quad (4a)$$

$$\text{trust in managers' competence and integrity}_{i,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}, \text{narrow-scope trust: average}_{i,t}) + u_i + e_{i,t} \quad (4b)$$

$$\text{trust in managers' competence and integrity}_{i,t} = f(\text{financial knowledge}_{i,t}, X_{i,t}, \text{broad-scope trust: average}_{i,t}) + u_i + e_{i,t} \quad (4c)$$

4. Results

4.1 Financial knowledge is key for broad-scope trust

We find convincing support for H7: financial knowledge has a positive relationship with broad-scope trust. Table 3 reports the regression results of model 1a (see column 1a, 2a and 3a) and model 1b that includes trust in the supervisor (see column 1b, 2b, and 3b). The coefficient on financial knowledge is positive and significant for all three types of broad-scope trust. People who consider themselves to be very knowledgeable of financial matters are 3 percentage points more likely to predominantly trust banks and also 3 percentage points more likely to completely trust banks than people who think they are unknowledgeable. In case of insurance companies these effects are 3 and 2 percentage points, whereas they are 3 and 1 percentage points in case of pension funds.

Table 3. Financial knowledge and broad-scope trust

	<i>Broad-scope trust in banks</i>		<i>Broad-scope trust in insurance companies</i>		<i>Broad-scope trust in pension funds</i>	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
<i>Financial knowledge</i>	0.13*** (0.03)	0.13*** (0.03)	0.11*** (0.03)	0.11*** (0.03)	0.10*** (0.03)	0.09*** (0.03)
<i>Male</i>	0.36*** (0.06)	0.32*** (0.06)	0.36*** (0.06)	0.33*** (0.06)	0.38*** (0.06)	0.35*** (0.06)
<i>Between 35 and 44</i>	-0.08 (0.09)	-0.06 (0.09)	-0.02 (0.08)	0.00 (0.08)	0.19** (0.08)	0.23*** (0.08)
<i>Between 45 and 54</i>	0.01 (0.09)	0.01 (0.09)	-0.18** (0.09)	-0.19** (0.09)	0.36*** (0.08)	0.38*** (0.08)
<i>Between 55 and 64</i>	-0.05 (0.09)	-0.02 (0.09)	-0.35*** (0.09)	-0.33*** (0.09)	0.52*** (0.09)	0.56*** (0.09)
<i>65 and over</i>	-0.14 (0.10)	-0.10 (0.10)	-0.44*** (0.10)	-0.41*** (0.10)	0.55*** (0.10)	0.61*** (0.09)
<i>Education: bachelor or higher</i>	0.02 (0.07)	0.02 (0.07)	0.07 (0.07)	0.07 (0.07)	0.06 (0.07)	0.06 (0.07)
<i>Income: EUR 1151-1800</i>	0.23* (0.12)	0.21* (0.12)	0.08 (0.12)	0.06 (0.12)	0.47*** (0.12)	0.44*** (0.12)
<i>Income: EUR 1801-2600</i>	0.22* (0.12)	0.21* (0.12)	0.01 (0.12)	0.01 (0.12)	0.32** (0.13)	0.31** (0.12)
<i>Income: > EUR 2600</i>	0.09 (0.13)	0.11 (0.13)	0.00 (0.13)	0.02 (0.13)	0.27** (0.13)	0.28** (0.13)
<i>Job</i>	0.06 (0.07)	0.06 (0.07)	0.10 (0.07)	0.10 (0.07)	0.05 (0.07)	0.04 (0.07)
<i>Homeowner</i>	0.01 (0.08)	0.01 (0.08)	0.13* (0.08)	0.13* (0.08)	0.08 (0.08)	0.08 (0.08)
<i>Household head lives with partner</i>	0.08 (0.08)	0.07 (0.08)	0.10 (0.08)	0.07 (0.08)	0.16** (0.08)	0.14* (0.08)
<i>Degree of urbanization</i>	0.01 (0.03)	0.01 (0.03)	0.00 (0.03)	0.00 (0.03)	0.03 (0.03)	0.03 (0.03)
<i>Region: north</i>	0.09 (0.12)	0.12 (0.12)	-0.07 (0.12)	-0.05 (0.12)	0.04 (0.11)	0.07 (0.11)
<i>Region: east</i>	-0.15 (0.10)	-0.13 (0.09)	-0.11 (0.09)	-0.09 (0.09)	-0.13 (0.09)	-0.11 (0.09)
<i>Region: south</i>	-0.10 (0.09)	-0.08 (0.09)	-0.08 (0.09)	-0.06 (0.09)	-0.07 (0.09)	-0.05 (0.09)
<i>Risk aversion</i>	-0.01 (0.02)	0.00 (0.02)	0.01 (0.02)	0.01 (0.02)	-0.03 (0.02)	-0.02 (0.02)
<i>Year after bankruptcy</i>	-0.13 (0.19)	-0.19 (0.18)				
<i>Year after bailout</i>	-0.36*** (0.09)	-0.39*** (0.09)				
<i>Trust in the supervisor</i>		0.48*** (0.03)		0.40*** (0.03)		0.53*** (0.03)
Number of observations	23,047	23,044	21,949	21,946	22,761	22,758
Number of respondents	5,394	5,394	5,332	5,332	5,347	5,347
Wald χ^2	101.91***	402.98***	112.62***	349.09***	156.86***	604.95***

Note: The table reports parameter estimates of random effects ordered logit regressions. Period: 2006-2019. Standard errors are clustered by household and shown in parentheses. The dependent variables range from 1 (no trust at all) to 5 (complete trust). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

The results also confirm our expectation of a positive relationship between trust in the supervisor and broad-scope trust (H6). The effect of trust in the supervisor on broad-scope trust is strong. For example, in case of banks the effect implies that people who have a lot of trust in DNB are 10 percentage more likely to predominantly trust banks and also 10 percentage points more likely to completely trust banks than people who have absolutely no trust in DNB.

In addition, broad-scope trust is related to sociodemographic variables. We find that males trust all types of institutions more than females. For example, in case of banks the likelihood that males answer that they predominantly trust banks is 2 percentage points higher. The same holds for the likelihood of answering 'complete trust'. Negative age effects are present in case of broad-scope trust in insurance companies, whereas trust in pension funds positively depends on age. For example, people aged 65 and over are 10 percentage points more likely to predominantly or completely trust their pension funds than people in the reference group. Trust in pension funds is higher for people with an income above EUR 1150 than for people with less income. In case of banks, there are also some positive income effects, although they are weaker. We find no significant relationship between income and broad-scope trust in insurance companies. Homeowners have more trust in insurance companies than renters. People who are part of a household in which the household head has a partner are more likely to trust pension funds than people who live in another type of household. All types of trust are unrelated to the level of education, having a job, the degree of urbanization of people's place of residence, the region where people live and risk aversion. Confirming the findings of van der Crujisen et al. (2016), our results suggest that personal crisis experience matter. Broad-scope trust is lower for people who experienced in the prior year that their bank was bailed-out. For example, people are 5 percentage points less likely to predominantly or completely trust banks in the year after they experienced a bail-out of their bank than people without such a personal crisis experience.

4.2 Financial knowledge also matters for trust in the supervisor

We also find support for H10: financial knowledge is significantly positively related to trust in the prudential banking supervisor DNB. Table 4 shows the estimation results for model 2. People who say they are very knowledgeable of financial matters are 3 percentage points more likely to have a lot of trust in the supervisor than people who think they are not financially knowledgeable. Very financially knowledgeable people are also 3 percentage points more likely to have pretty much trust in the supervisor. Column 2 shows the results of a regression that includes controls for personal crisis experiences. Surprisingly, trust in DNB is significantly higher for people who experienced a bankruptcy or bailout of their bank.

Table 4. Financial knowledge and trust in the supervisor

	<i>Trust in the supervisor</i>	
	(1a)	(1b)
<i>Financial knowledge</i>	0.09*** (0.02)	0.09*** (0.02)
<i>Male</i>	0.21*** (0.03)	0.21*** (0.03)
<i>Between 35 and 44</i>	-0.08 (0.06)	-0.08 (0.06)
<i>Between 45 and 54</i>	0.08 (0.06)	0.08 (0.06)
<i>Between 55 and 64</i>	0.01 (0.06)	-0.00 (0.06)
<i>65 and over</i>	0.01 (0.07)	0.01 (0.07)
<i>Education: bachelor or higher</i>	0.07* (0.04)	0.06 (0.04)
<i>Income: EUR 1151-1800</i>	0.17** (0.08)	0.17** (0.08)
<i>Income: EUR 1801-2600</i>	0.09 (0.08)	0.09 (0.08)
<i>Income: > EUR 2600</i>	-0.00 (0.09)	0.00 (0.09)
<i>Job</i>	-0.02 (0.04)	-0.02 (0.04)
<i>Homeowner</i>	0.09* (0.05)	0.09* (0.05)
<i>Household head lives with partner</i>	0.05 (0.05)	0.04 (0.05)
<i>Degree of urbanization</i>	0.00 (0.02)	0.00 (0.01)
<i>Region: north</i>	-0.08 (0.06)	-0.08 (0.06)
<i>Region: east</i>	-0.13** (0.05)	-0.12** (0.05)
<i>Region: south</i>	-0.13*** (0.05)	-0.13*** (0.04)
<i>Risk aversion</i>	-0.02 (0.02)	-0.03 (0.02)
<i>Year after bankruptcy</i>		0.50*** (0.18)
<i>Year after bailout</i>		0.16** (0.08)
Number of observations	23,719	23,541
Number of respondents	5,479	5,452
Wald χ^2	125.45***	138.28***

Note: The table reports parameter estimates of random effects ordered logit regressions. Period: 2006-2019. Standard errors are clustered by household and shown in parentheses. The dependent variables range from 1 (absolutely no trust) to 4 (a lot of trust). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

4.3 Financial knowledge is also important for narrow-scope trust

Our findings on narrow-scope trust support H8: people with a higher degree of financial knowledge are more likely to trust their own financial institutions. Table 5 focusses on trust in the financial soundness of respondents' own banks, insurance companies and pension funds and shows that a higher degree of financial knowledge also goes along with more trust in the financial health of these institutions. Compared to financially unknowledgeable people, very financially knowledgeable people are more likely to trust banks to be able to repay their deposits at all times

Table 5. Financial knowledge and narrow-scope trust

	<i>Narrow-scope trust in banks</i>				<i>Narrow-scope trust in insurance company</i>				<i>Narrow-scope trust in pension funds</i>			
	(1a)	(1b)	(1c)	(1d)	(2a)	(2b)	(2c)	(2d)	(3a)	(3b)	(3c)	(3d)
<i>Financial knowledge</i>	0.09***	0.09***	0.06**	-0.09	0.10**	0.10**	0.07	-0.37*	0.10**	0.10**	0.07**	0.01
	(0.03)	(0.03)	(0.03)	(0.15)	(0.05)	(0.05)	(0.04)	(0.22)	(0.04)	(0.04)	(0.03)	(0.13)
<i>Male</i>	0.46***	0.47***	0.30***	0.30***	0.51***	0.52***	0.27***	0.27***	0.57***	0.59***	0.34***	0.34***
	(0.06)	(0.06)	(0.05)	(0.05)	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
<i>Between 35 and 44</i>	-0.22***	-0.22***	-0.23***	-0.23***	-0.30***	-0.32***	-0.29***	-0.29***	0.21**	0.21**	0.09	0.09
	(0.08)	(0.08)	(0.07)	(0.07)	(0.11)	(0.11)	(0.10)	(0.10)	(0.10)	(0.10)	(0.08)	(0.08)
<i>Between 45 and 54</i>	-0.18**	-0.19**	-0.22***	-0.22***	-0.52***	-0.54***	-0.43***	-0.43***	0.44***	0.43***	0.24***	0.24***
	(0.09)	(0.09)	(0.07)	(0.07)	(0.12)	(0.12)	(0.11)	(0.11)	(0.11)	(0.11)	(0.08)	(0.08)
<i>Between 55 and 64</i>	-0.26***	-0.24***	-0.20***	-0.20***	-0.56***	-0.59***	-0.32***	-0.32***	0.85***	0.85***	0.78***	0.78***
	(0.09)	(0.09)	(0.08)	(0.08)	(0.13)	(0.13)	(0.12)	(0.12)	(0.11)	(0.11)	(0.09)	(0.09)
<i>65 and over</i>	-0.33***	-0.29***	-0.13	-0.13	-0.77***	-0.78***	-0.50***	-0.50***	1.00***	1.02***	0.93***	0.93***
	(0.10)	(0.10)	(0.08)	(0.08)	(0.15)	(0.15)	(0.14)	(0.14)	(0.13)	(0.13)	(0.10)	(0.10)
<i>Education: bachelor or higher</i>	0.07	-0.04	0.02	0.02	-0.03	-0.13	-0.00	-0.00	-0.06	-0.13*	-0.08	-0.08
	(0.07)	(0.07)	(0.05)	(0.05)	(0.09)	(0.09)	(0.07)	(0.07)	(0.08)	(0.08)	(0.06)	(0.06)
<i>Income: EUR 1151-1800</i>	0.17	0.17	0.11	0.10	0.16	0.17	0.20	0.20	0.23	0.24	-0.04	-0.04
	(0.13)	(0.12)	(0.11)	(0.11)	(0.21)	(0.21)	(0.21)	(0.21)	(0.15)	(0.15)	(0.13)	(0.13)
<i>Income: EUR 1801-2600</i>	0.12	0.10	0.01	0.01	0.18	0.15	0.24	0.24	0.19	0.18	0.07	0.07
	(0.13)	(0.13)	(0.11)	(0.11)	(0.21)	(0.21)	(0.21)	(0.21)	(0.15)	(0.15)	(0.13)	(0.13)
<i>Income: > EUR 2600</i>	-0.05	-0.09	-0.07	-0.07	0.13	0.08	0.19	0.18	0.18	0.16	0.16	0.16
	(0.14)	(0.14)	(0.12)	(0.12)	(0.22)	(0.22)	(0.21)	(0.21)	(0.16)	(0.16)	(0.13)	(0.13)
<i>Job</i>	0.03	0.02	-0.03	-0.03	-0.15*	-0.17*	-0.22***	-0.22***	-0.08	-0.08	-0.17**	-0.17**
	(0.07)	(0.07)	(0.06)	(0.06)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.07)	(0.07)
<i>Homeowner</i>	0.01	-0.04	-0.00	-0.00	0.24*	0.18	0.09	0.09	-0.00	-0.03	-0.03	-0.03
	(0.08)	(0.08)	(0.07)	(0.07)	(0.13)	(0.12)	(0.11)	(0.11)	(0.09)	(0.09)	(0.07)	(0.07)
<i>Household head lives with partner</i>	0.11	0.13	0.06	0.06	0.28**	0.30**	0.25**	0.24**	0.08	0.10	0.01	0.01
	(0.08)	(0.08)	(0.07)	(0.07)	(0.12)	(0.12)	(0.10)	(0.10)	(0.09)	(0.09)	(0.07)	(0.07)
<i>Degree of urbanization</i>	0.01	0.01	0.01	0.01	-0.02	-0.02	-0.02	-0.02	0.03	0.03	0.02	0.02
	(0.03)	(0.03)	(0.02)	(0.02)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
<i>Region: north</i>	0.04	0.01	-0.02	-0.02	-0.01	-0.03	0.03	0.03	0.02	0.01	0.01	0.01
	(0.12)	(0.12)	(0.09)	(0.09)	(0.15)	(0.15)	(0.12)	(0.12)	(0.13)	(0.13)	(0.10)	(0.10)
<i>Region: east</i>	-0.15	-0.15	-0.06	-0.06	-0.14	-0.16	-0.08	-0.08	-0.06	-0.06	-0.02	-0.02
	(0.10)	(0.10)	(0.08)	(0.08)	(0.12)	(0.12)	(0.09)	(0.09)	(0.11)	(0.10)	(0.08)	(0.08)
<i>Region: south</i>	-0.14	-0.15	-0.11	-0.11	0.00	-0.01	0.01	0.02	-0.08	-0.08	-0.03	-0.03
	(0.09)	(0.09)	(0.07)	(0.07)	(0.12)	(0.11)	(0.10)	(0.10)	(0.10)	(0.10)	(0.07)	(0.07)
<i>Risk aversion</i>	0.06**	0.06**	0.11***	0.11***	0.05	0.05	0.09***	0.09***	-0.01	-0.01	0.04*	0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)

Table 5. Financial knowledge and narrow-scope trust (cont.)

	<i>Narrow-scope trust in banks</i>				<i>Narrow-scope trust in insurance company</i>				<i>Narrow-scope trust in pension funds</i>			
	(1a)	(1b)	(1c)	(1d)	(2a)	(2b)	(2c)	(2d)	(3a)	(3b)	(3c)	(3d)
<i>Year after bankruptcy</i>	-0.18	-0.13	-0.09	-0.09								
	(0.19)	(0.20)	(0.21)	(0.21)								
<i>Year after bailout</i>	-0.50***	-0.53***	-0.35***	-0.35***								
	(0.09)	(0.09)	(0.10)	(0.10)								
<i>Generalized trust</i>		0.77***	0.53***	0.53***	0.66***	0.27***	0.27***		0.51***	0.39***	0.39***	
		(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.07)		(0.06)	(0.05)	(0.05)	
<i>Broad-scope trust in banks</i>			2.64***	2.55***								
			(0.05)	(0.10)								
<i>Financial knowledge*broad-scope trust in banks</i>				0.04								
				(0.04)								
<i>Broad-scope trust in insurance companies</i>						3.08***	2.83***					
						(0.08)	(0.14)					
<i>Financial knowledge*broad-scope trust in insurance companies</i>							0.12**					
							(0.06)					
<i>Broad-scope trust in pension funds</i>										3.22***	3.18***	
										(0.06)	(0.10)	
<i>Financial knowledge*broad-scope trust in pension funds</i>											0.02	
											(0.04)	
Number of observations	23,181	23,181	22,961	22,961	9,818	9,818	9,735	9,735	17,630	17,630	17,513	17,513
Number of respondents	5,410	5,410	5,389	5,389	3,347	3,347	3,326	3,326	4,389	4,389	4,377	4,377
Wald χ^2	130.92***	370.37***	2995.83***	3002.29***	94.01***	171.69***	1706.28***	1708.59***	234.53***	323.27***	3555.14***	3557.26***

Note: The table reports parameter estimates of random effects ordered logit regressions. Period: 2006-2019. Standard errors are clustered by household and shown in parentheses. The dependent variables range from 1 (no trust at all) to 5 (complete trust). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

(column 1a), life insurance companies to pay insurance money at all times (column 2a), and pension funds to pay pension benefits at all times (column 3a). For example, someone who thinks (s)he is very knowledgeable of financial matters is 3 percentage points more likely to completely trust his/her banks to be able to repay deposits at all times than someone who is financially unknowledgeable.

The financial knowledge effect is robust to the inclusion of generalized trust (columns 1b, 2b and 3b). People who in general trust most other people have more trust in their banks, life insurance company and pension funds than people with low trust; this finding provides support for H3. For example, they are 9 percentage points more likely to have complete trust in the financial health of their banks.

Broad-scope trust is strongly positively related to narrow-scope trust (columns 1c, 2c and 3c). This result implies support for H4a and not for H4b. For example, the likelihood that someone completely trusts the financial soundness of one's own bank(s) is 72% if one also has complete trust in the financial soundness of banks in general, whereas it is 25% if one predominantly trusts banks in general. The regressions that include broad-scope trust also reveal that part of the financial literacy effect takes place indirectly via higher broad-scope trust. The effect of financial knowledge is smaller in these regressions (columns 1c, 2c, and 3c) than in the regressions without broad-scope trust (columns 1b, 2b, and 3b). In case of insurance companies (column 2c) the direct financial knowledge effect is even insignificant.

We do not find support for H11 (financial knowledge has a greater positive effect on narrow-scope trust when broad-scope trust is low than when broad-scope trust is high). For banks and pension funds the coefficient on the interaction term financial knowledge*broad-scope trust in banks is insignificant (columns 1c and 3c). For life insurance companies, it is positive and significant (column 2c). The latter implies that financial knowledge has a greater positive effect on narrow-scope trust when broad-scope trust is high than when broad-scope trust is low.

Narrow-scope trust varies between people. Males have more trust in their financial institutions than females. For example, a male is 3 percentage points more likely to completely trust his own bank(s) (based on column 1c). Compared to people younger than 35, older people are less likely to trust the financial health of their banks and insurance companies. In contrast, trust in one's own pension fund(s) increases with age. For example, someone who is 65 or over is 7 percentage points more likely to completely trust the financial soundness of one's own pension fund(s) than someone who is younger than 35 (based on column 3b). People with a job have less trust in their own life insurance and pension fund than people without a job. Trust in one's own life insurance company is relatively high for people who are living together with a partner or are part of a household where the household head has a partner. However, the presence of a partner is not significantly related to narrow-scope trust in banks and narrow-scope trust in pension

funds. Narrow-scope trust is also unrelated to household income. For all types of narrow-scope trust it does not matter where one lives: the coefficients on region dummies and the degree of urbanization variable are insignificant. When we include the broad-scope trust variables, we find that the stronger people's degree of risk aversion is, the stronger trust in the financial soundness of one's bank, life insurance company and pension fund.

4.4 Financial knowledge is also key for trust in the competence and integrity of managers

Finally, we show that financial knowledge is also positively related to trust in the competence and integrity of managers of financial institutions (Table 6), so H9 is confirmed. Compared to people who find themselves unknowledgeable of financial matters, people who think they are very knowledgeable are 6 percentage points more likely to agree or completely agree that managers are competent (column 2a) and 3 percentage points more likely to agree or completely agree that managers are integer (column 3a).

The effect of financial knowledge is smaller when the average narrow-scope trust measure is included (columns 1b, 2b and 3b). We find support for H5a: there is a positive relationship between narrow-scope trust and trust in the competence and integrity of managers of financial institutions. For example, a one-point higher narrow-scope trust goes along with a 15 percentage points higher likelihood of agreeing that managers are competent and a 2 percentage higher likelihood of completely agreeing.

We also find support for H5b: there is a positive relationship between broad-scope trust and trust in the competence and integrity of managers of financial institutions (columns 1c, 2c, 3c). To illustrate the effect, a one point higher broad-scope trust goes along with a 14 percentage points higher likelihood of agreeing or completely agreeing that managers of financial institutions are integer.

Trust in financial institutions' managers also relates to various sociodemographic factors. In this discussion, we focus on the 2010-2019 findings, when trust in the competence and integrity was measured separately. Males have less trust in financial institutions' managers than females. Men are 4 percentage points less likely to agree or completely agree that these managers are competent (based on column 2a) and 3 percentage points less likely to agree or fully agree that they are integer (based on column 3a) than women. Recall that, in contrast, men had more trust in the financial soundness of financial institutions. Age also matters. Compared to people below 35, people of 45 and above are less likely to find managers of financial institutions competent. Compared to young people, people aged 65 or above have more trust in the integrity of these managers. But this effect is insignificant when either narrow-scope trust or broad-scope trust is included. Compared to low-income people, people in the highest income class are more likely to

Table 6. Financial knowledge and trust in financial sector managers' competence and integrity

	Trust in managers' competence and integrity			Trust in managers' competence			Trust in managers' integrity		
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
<i>Financial knowledge</i>	0.33*** (0.06)	0.22*** (0.06)	0.20*** (0.06)	0.14*** (0.04)	0.11*** (0.04)	0.09** (0.04)	0.10** (0.04)	0.09** (0.04)	0.07* (0.04)
<i>Male</i>	-0.05 (0.09)	-0.19** (0.09)	-0.26*** (0.09)	-0.19*** (0.07)	-0.29*** (0.07)	-0.31*** (0.07)	-0.23*** (0.07)	-0.32*** (0.07)	-0.33*** (0.07)
<i>Between 35 and 44</i>	0.10 (0.16)	0.12 (0.15)	0.00 (0.15)	-0.03 (0.11)	-0.06 (0.10)	-0.12 (0.10)	0.12 (0.10)	0.09 (0.10)	0.05 (0.10)
<i>Between 45 and 54</i>	0.16 (0.15)	0.11 (0.14)	-0.03 (0.14)	-0.32*** (0.11)	-0.38*** (0.11)	-0.44*** (0.10)	-0.04 (0.11)	-0.12 (0.10)	-0.17 (0.10)
<i>Between 55 and 64</i>	-0.09 (0.16)	-0.21 (0.15)	-0.31** (0.15)	-0.39*** (0.11)	-0.59*** (0.10)	-0.63*** (0.10)	0.03 (0.11)	-0.18* (0.10)	-0.20* (0.10)
<i>65 and over</i>	-0.17 (0.18)	-0.34** (0.17)	-0.28* (0.17)	-0.03 (0.12)	-0.29** (0.11)	-0.38*** (0.11)	0.39*** (0.12)	0.16 (0.11)	0.10 (0.11)
<i>Education: bachelor or higher</i>	0.20* (0.11)	0.20** (0.10)	0.18* (0.10)	0.11 (0.08)	0.06 (0.08)	0.04 (0.08)	-0.03 (0.08)	-0.09 (0.08)	-0.09 (0.08)
<i>Income: EUR 1151-1800</i>	-0.01 (0.24)	-0.04 (0.22)	-0.25 (0.20)	0.12 (0.16)	0.08 (0.15)	-0.01 (0.14)	0.11 (0.13)	0.13 (0.13)	0.03 (0.13)
<i>Income: EUR 1801-2600</i>	-0.25 (0.24)	-0.34 (0.22)	-0.52*** (0.20)	0.18 (0.16)	0.07 (0.15)	-0.04 (0.14)	0.19 (0.14)	0.12 (0.13)	0.01 (0.13)
<i>Income: > EUR 2600</i>	-0.10 (0.26)	-0.19 (0.24)	-0.40* (0.22)	0.44*** (0.16)	0.34** (0.16)	0.22 (0.15)	0.32** (0.14)	0.26* (0.14)	0.14 (0.13)
<i>Job</i>	-0.15 (0.12)	-0.09 (0.12)	-0.23** (0.12)	0.13* (0.08)	0.19*** (0.07)	0.11 (0.07)	-0.04 (0.08)	-0.01 (0.07)	-0.08 (0.07)
<i>Homeowner</i>	0.05 (0.14)	0.04 (0.13)	0.01 (0.13)	0.13 (0.09)	0.10 (0.08)	0.09 (0.08)	0.11 (0.09)	0.11 (0.09)	0.09 (0.09)
<i>Household head lives with partner</i>	0.24* (0.14)	0.21 (0.13)	0.24* (0.13)	-0.27*** (0.10)	-0.25*** (0.09)	-0.22** (0.09)	-0.12 (0.09)	-0.11 (0.08)	-0.09 (0.08)
<i>Degree of urbanization</i>	-0.02 (0.04)	-0.03 (0.04)	-0.06 (0.04)	-0.03 (0.03)	-0.02 (0.03)	-0.02 (0.03)	-0.05 (0.03)	-0.05 (0.03)	-0.05 (0.03)
<i>Region: north</i>	0.03 (0.18)	-0.11 (0.16)	-0.09 (0.16)	-0.04 (0.14)	-0.06 (0.13)	-0.09 (0.12)	0.06 (0.15)	0.04 (0.14)	0.02 (0.14)
<i>Region: east</i>	-0.02 (0.16)	-0.01 (0.14)	0.01 (0.13)	0.03 (0.11)	0.06 (0.10)	0.08 (0.10)	0.04 (0.11)	0.09 (0.10)	0.09 (0.10)
<i>Region: south</i>	0.24* (0.14)	0.20 (0.13)	0.24* (0.13)	0.16 (0.12)	0.20* (0.10)	0.21** (0.10)	0.03 (0.11)	0.07 (0.11)	0.07 (0.10)
<i>Risk aversion</i>	-0.09** (0.04)	-0.11*** (0.04)	-0.09** (0.04)	-0.08*** (0.03)	-0.10*** (0.03)	-0.08*** (0.03)	-0.07** (0.03)	-0.08*** (0.03)	-0.07** (0.03)
<i>Year after bankruptcy</i>	-0.56 (0.55)	-0.16 (0.48)	-0.30 (0.46)	0.38 (0.26)	0.18 (0.27)	0.13 (0.25)	0.57** (0.27)	0.42 (0.26)	0.34 (0.27)
<i>Year after bailout</i>	-2.21*** (0.12)	-1.62*** (0.13)	-1.56*** (0.13)	-0.80*** (0.16)	-0.70*** (0.16)	-0.73*** (0.17)	-0.28* (0.14)	-0.18 (0.15)	-0.21 (0.15)
<i>Narrow-scope trust: average</i>		1.60*** (0.07)			1.16*** (0.04)			1.13*** (0.04)	
<i>Broad-scope trust: average</i>			2.06*** (0.08)			1.52*** (0.05)			1.40*** (0.05)
Number of observations	5,289	5,276	5,276	17,187	17,123	17,155	17,154	17,092	17,119
Number of respondents	2,173	2,170	2,170	4,599	4,593	4,596	4,577	4,570	4,572
Wald χ^2	409.63***	836.11***	998.31***	116.47***	895.02***	1152.42***	73.64***	877.51***	1002.63***
Period	2006-2009	2006-2009	2006-2009	2010-2019	2010-2019	2010-2019	2010-2019	2010-2019	2010-2019

Note: The table reports parameter estimates of random effects ordered logit regressions. Standard errors are clustered by household and shown in parentheses. The dependent variables range from 1 (completely disagree that managers of financial institutions are in general knowledgeable and/or sound) to 5 (completely agree). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

find managers of financial institutions competent and integer. Trust in the competence is also relatively high for people with a paid job and people who live in the south of the Netherlands. The effect of education is insignificant and the effect of having a partner is negative. We also find that

stronger risk aversion goes along with lower trust in managers' competence and integrity. Trust in managers is rather low for people who experienced a bailout of their bank in the prior year but high for people who experienced a bankruptcy of their bank. However, the latter effect is not robust to the inclusion of either narrow-scope trust or broad-scope trust.

4.5 Robustness

As a robustness test we rerun the regressions with alternative financial knowledge variables. First, we use *manager household finances* instead of the self-assessed financial knowledge variable. Manager household finances is a binary dummy that is 1 for household members who are most involved in household finances and 0 for other household members. Second, we use *financial sector job* instead of financial knowledge. Financial sector job is 1 for people working in the financial sector and 0 for people without such a job. The results of these analyses are available upon request.

Regarding the first robustness test, when we include manager household finances instead of financial knowledge we also find support for H7, H8, H9 and H10. Compared to household members who are not in charge of household finances, people who are most involved in household finances have a higher degree of broad-scope trust, narrow-scope trust, trust in the competence and integrity of financial sector managers and trust in the supervisor. Our other findings are also the same as before. So, we find support for H3, H4a, H5a, H5b and H6 and no support for H11.

Our baseline results are also confirmed when we use financial sector job instead. Compared to other people, people with a financial sector job have a higher degree of broad-scope trust, narrow-scope trust, trust in the competence and integrity of managers of financial institutions and in DNB.

As another robustness test, we use more general broad-scope measures of trust in the financial sector in general, which do not focus on the financial health of financial institutions. These measures are only available for 2019. *Trust in the financial sector* is an ordered variable capturing trust in the health of financial institutions such as banks, insurance companies and pension funds. It ranges from 1 (absolutely no trust) to 4 (a lot of trust) and is on average 2.4 for the observations included in the regressions. The other trust measure *trust in the financial sector 2* is a binary dummy. It is 1 for respondent who think that in general most financial institutions such as banks, insurance companies and pension funds can be trusted and 0 for respondents who believe that one cannot be careful enough in dealing with financial institutions. On average it is 0.44 for the respondents included in the regressions, so 44% of the people think that in general financial institutions can be trusted.

Our findings are robust to the use of these alternative measures. Again, we find that better financial knowledge and more trust in the supervisor go along with a significantly higher degree

of broad-scope trust (Appendix B, Table B.3). And, also in line with our previous findings, narrow-scope trust in the various types of financial institutions and trust in financial sector managers both positively depend on broad-scope trust. The latter results are available upon request.

5. Conclusions and policy implications

To sum up, using longitudinal trust data this research shows that financial literacy is key for trust in financial institutions. Compared to financially illiterate consumers, consumers with a high degree of financial knowledge are more likely to trust banks, insurance companies and pension funds, and the competence and integrity of the managers of these institutions. This holds both for general trust (broad-scope trust) and trust in one's own financial institutions (narrow-scope trust), which is significantly higher. Financially knowledgeable people are also more likely to trust the prudential supervisor. This finding is robust to the usage of three different financial literacy measures: self-assessed financial knowledge, being in charge of household finances and working in the financial sector.

We also find that people with a higher degree of trust in the financial health of financial institutions in general are also more likely to trust the financial health of their own banks, life insurance company and pension funds. In other words, there is a positive link between broad-scope and narrow-scope trust. For all types of institutions, we also find a positive relationship between generalized trust (trust in other people) and narrow-scope trust.

In addition, people with high narrow-scope or broad-scope trust are more likely to trust the integrity and competence of managers of financial institutions than people with low trust in financial institutions. Furthermore, we find that higher levels of trust in the banking supervisor go along with higher levels of broad-scope trust.

Last, our findings provide valuable insights into the role of consumers' background characteristics. Several of these relationships depend on the type of trust that is researched. For example, compared to females, males are relatively likely to trust the financial health of financial institutions but unlikely to trust the competence and integrity of these institutions.

For central banks and other banking supervisors, this research highlights two ways to strengthen trust in the financial sector. The first way is to support or even develop policies that contribute to financial literacy. The second approach is to act in a way that not only supports trust in financial institutions directly but also indirectly via higher trust in the supervisor itself.

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Appendix A. Description of variables

Table A.1 Description of variables included in the baseline regression analyses (1/2)

Variable	Description	Mean	Sd	Min	Max	N
Key variables						
<i>Broad-scope trust in banks</i>	Answer to 'In general, do you trust that banks in the Netherlands are able to repay deposits at all times?' (1 = no, not at all, 2 = no, predominantly not, 3 = neutral, 4 = yes, predominantly, 5 = yes, completely).	3.72	0.82	1	5	23,047
<i>Broad-scope trust in insurance companies</i>	Answer to 'In general, do you trust that insurance companies in the Netherlands are able to fulfil their payment obligations to all persons insured at all times?' (1 = no, not at all, 2 = no, predominantly not, 3 = neutral, 4 = yes, predominantly, 5 = yes, completely).	3.66	0.78	1	5	21,949
<i>Broad-scope trust in pension funds</i>	Answer to the question 'In general, do you trust pension funds in the Netherlands to fulfil their payment obligations towards retirees at all times?' (1 = no, not at all, 2 = no, predominantly not, 3 = neutral, 4 = yes, predominantly, 5 = yes, completely.)	3.42	0.91	1	5	22,761
<i>Trust in the supervisor</i>	Ordered variable capturing trust in DNB (1 = absolutely no trust, 2 = not so much trust, 3 = pretty much trust, 4 = a lot of trust).	2.71	0.75	1	4	23,719
<i>Narrow-scope trust in banks</i>	Answer to 'At the moment, do you trust that the bank(s) at which you have deposits is (are) able to repay these deposits at all times?' (1 = no, not at all, 2 = no, predominantly not, 3 = neutral, 4 = yes, predominantly, 5 = yes, completely).	3.98	0.83	1	5	23,181
<i>Narrow-scope trust in own life insurance company</i>	Answer to 'At the moment, do you trust that the life insurance company at which you have contracts is able to pay your insurance money at all times?' (1 = no, not at all, 2 = no, predominantly not, 3 = neutral, 4 = yes, predominantly, 5 = yes, completely).	3.94	0.79	1	5	9,813
<i>Narrow-scope trust in own pension funds</i>	Answer to the question 'Do you trust your pension fund(s) to be able to pay your pension benefit at all times?' (1 = no, not at all, 2 = no, predominantly not, 3 = neutral, 4 = yes, predominantly, 5 = yes, completely.)	3.70	0.94	1	5	17,630
<i>Trust in managers' competence and integrity</i>	Agreement with 'Managers of financial institutions are in general knowledgeable and sound.' (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree).	3.34	0.80	1	5	5,289
<i>Trust in managers' competence</i>	Agreement with 'Managers of financial institutions are in general knowledgeable.' (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree).	3.26	0.83	1	5	17,187
<i>Trust in managers' integrity</i>	Agreement with 'Managers of financial institutions are in general sound.' (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = completely agree).	2.83	0.87	1	5	17,154
<i>Broad-scope trust: average</i>	The average of the different broad-scope trust measures. For each respondent this average is based on the available broad-scope trust measures, so at most three.	3.60	0.68	1	5	22,678
<i>Narrow-scope trust: average</i>	The average of the different narrow-scope trust measures. For each respondent this average is based on the available narrow-scope trust measures, so at most three.	3.88	0.75	1	5	22,645
<i>Financial knowledge</i>	Self-assessed knowledge of financial matters (1 = not knowledgeable, 2 = more or less knowledgeable, 3 = knowledgeable, 4 = very knowledgeable). 2019 data on self-assessed knowledge of financial matters is not available yet. Therefore, we take the most recent available data, assuming that the self-assessment did not change.	2.14	0.73	1	4	23,722

Note: This table describes the variables used in the regressions of which the results are reported in Tables 3, 4, 5 and 6. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions.

Table A.1 Description of variables included in the baseline regression analyses (2/2)

Variable	Description	Mean	Sd	Min	Max	N
Control variables						
<i>Male</i>	Binary dummy (1 = male, 0 = female).	0.55	0.50	0	1	23,722
<i>34 and below</i>	Binary dummy (1 = 34 and below, 0 = else). Reference category.	0.13	0.34	0	1	23,722
<i>Between 35 and 44</i>	Binary dummy (1 = between 35 and 44, 0 = else).	0.16	0.37	0	1	23,722
<i>Between 45 and 54</i>	Binary dummy (1 = between 45 and 54, 0 = else).	0.18	0.38	0	1	23,722
<i>Between 55 and 64</i>	Binary dummy (1 = between 55 and 64, 0 = else).	0.22	0.41	0	1	23,722
<i>65 and over</i>	Binary dummy (1 = 65 and over, 0 = else).	0.31	0.46	0	1	23,722
<i>Education: bachelor or higher</i>	Binary dummy (1 = higher vocational education or university education, 0 = else).	0.38	0.49	0	1	23,722
<i>Income: ≤ EUR 1150</i>	Binary dummy (1 = household net monthly income ≤ EUR 1150, 0 = else). Reference category.	0.05	0.22	0	1	23,722
<i>Income: EUR 1151-1800</i>	Binary dummy (1 = household net monthly income ≥ EUR 1151 and ≤ EUR 1800, 0 = else).	0.17	0.37	0	1	23,722
<i>Income: EUR 1801-2600</i>	Binary dummy (1 = household net monthly income ≥ EUR 1801 and ≤ EUR 2600, 0 = else).	0.29	0.45	0	1	23,722
<i>Income: > EUR 2600</i>	Binary dummy (1 = household net monthly income > EUR 2600, 0 = else).	0.49	0.50	0	1	23,722
<i>Job</i>	Binary dummy (1 = paid job, work in family business or self-employed, 0 = else)	0.51	0.50	0	1	23,722
<i>Homeowner</i>	Binary dummy (1 = homeowner, 0 = else).	0.75	0.43	0	1	23,722
<i>Household head lives with partner</i>	Binary dummy (1 = head of household is living together or married, 0 = else).	0.76	0.43	0	1	23,722
<i>Degree of urbanization</i>	Degree of urbanization of respondent's residence based on the address density per km ² (1 = 500 or less, 2 = 500-1000, 3 = 1000-1500, 4 = 1500-2500, 5 = more than 2500).	2.98	1.32	1	5	23,722
<i>Region: west</i>	Binary dummy (1 = living in the west of the Netherlands, 0 = else). Reference category.	0.43	0.49	0	1	23,722
<i>Region: north</i>	Binary dummy (1 = living in the north of the Netherlands, 0 = else).	0.13	0.33	0	1	23,722
<i>Region: east</i>	Binary dummy (1 = living in the east of the Netherlands, 0 = else).	0.21	0.40	0	1	23,722
<i>Region: south</i>	Binary dummy (1 = living in the south of the Netherlands, 0 = else).	0.24	0.43	0	1	23,722
<i>Risk aversion</i>	Average agreement measured on a 1 (totally disagree) to 7 (totally agree) scale with six statements on risk taking: 1) 'I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns.', 2) 'I do not invest in shares, because I find this too risky.', 3) 'If I think an investment will be profitable, I am prepared to borrow money to make this investment.' (reversed scale), 4) 'I want to be certain that my investments are safe.', 5) 'If I want to improve my financial position, I should take financial risks.' (reversed scale), and 6) 'I am prepared to take the risk to lose money, when there is also a chance to gain money.' (reversed scale).	5.27	1.02	1	7	23,722
<i>Year after bankruptcy</i>	Binary dummy that is 1 in the year after a bankruptcy for customers who experienced that their bank went bankrupt in the prior year and 0 else.	0.01	0.08	0	1	23,544
<i>Year after bailout</i>	Binary dummy that is 1 in the year after a bailout for customers who experienced that their bank was bailed out in the prior year and 0 else.	0.03	0.18	0	1	23,544
<i>Generalized trust</i>	Binary dummy (1 = in general most other people can be trusted, 0 = one cannot be careful enough in dealing with people).	0.67	0.47	0	1	23,467

Note: This table describes the variables used in the regressions of which the results are reported in Tables 3, 4, 5 and 6. The mean, standard deviation (sd), minimum (min), maximum (max), and number of observations (N) are reported for the sample included in these regressions.

Table A.2 Description of variables included in the robustness analyses

Variable	Description	Mean	Sd	Min	Max	N
<i>Manager household finances</i>	Binary dummy (1 = household member who is most involved in finances, 0 = else).	0.68	0.46	0	1	23,901
<i>Financial sector job</i>	Binary dummy (1 = working in the financial sector, 0 = no job or a job in another sector).	0.03	0.18	0	1	23,914
<i>Trust in the financial sector</i>	Ordered variable capturing trust in financial institutions such as banks, insurance companies and pension funds (1 = absolutely no trust, 2 = not so much trust, 3 = pretty much trust, 4 = a lot of trust).	2.38	0.69	1	4	1,777
<i>Trust in the financial sector 2</i>	Binary dummy (1 = in general most financial institutions such as banks, insurance companies and pension funds can be trusted, 0 = one cannot be careful enough in dealing with financial institutions).	0.44	0.50	0	1	1,779

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

Appendix B: Additional results

Table B.1. Difference between generalized trust and narrow-scope trust: annual data

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total sample
Banks															
(a) Generalized trust 2	3.41	3.71	3.78	3.84	3.61	3.46	3.83	3.77	3.73	3.60	3.54	3.57	3.54	3.55	3.64
(b) Narrow-scope trust	4.41	4.31	4.20	3.89	3.97	3.92	3.91	3.82	3.82	3.77	3.80	3.91	3.87	3.91	3.95
(a) - (b)	-1.00***	-0.60***	-0.42***	-0.06*	-0.36***	-0.46***	-0.08**	-0.04	-0.09***	-0.16***	-0.26***	-0.33***	-0.33***	-0.36***	-0.32***
Number of observations	1,931	2,046	1,918	1,882	2,067	2,096	2,231	2,025	2,630	2,549	2,073	2,509	2,136	2,567	30,660
Life insurance companies															
(c) Generalized trust 2	3.44	3.75	3.76	3.89	3.68	3.55	4.00	3.88	3.82	3.65	3.58	3.65	3.56	3.49	3.67
(d) Narrow-scope trust	4.31	4.28	4.20	3.82	3.92	3.83	3.83	3.81	3.92	3.97	3.98	4.05	3.71	3.67	3.92
(c) - (d)	-0.88***	-0.53***	-0.45***	0.07	-0.24***	-0.27***	0.12**	0.06	-0.10**	-0.32***	-0.40***	-0.40***	-0.15***	-0.18***	-0.25***
Number of observations	841	869	845	751	818	823	845	730	1,081	898	672	802	1,441	1,803	13,219
Pension funds															
(e) Generalized trust 2	3.50	3.79	3.87	3.93	3.74	3.58	3.93	3.86	3.84	3.70	3.64	3.67	3.64	3.68	3.74
(f) Narrow-scope trust	4.03	4.12	4.17	3.63	3.79	3.59	3.42	3.44	3.49	3.55	3.59	3.60	3.68	3.67	3.68
(e) - (f)	-0.53***	-0.32***	-0.30***	-0.30***	-0.04	-0.02	0.51***	0.42***	0.36***	0.15***	0.04	0.07*	-0.04	0.01	0.06***
Number of observations	1,303	1,380	1,345	1,325	1,517	1,547	1,702	1,529	2,017	1,842	1,587	1,876	1,559	1,853	22,382

Note: ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively (one-sided paired t-test).

Table B.2. Narrow-scope and broad-scope trust: annual data

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total sample
Banks															
(a) Narrow-scope trust	4.41	4.31	4.20	3.90	3.98	3.93	3.91	3.82	3.82	3.77	3.81	3.91	3.87	3.91	3.96
(b) Broad-scope trust	4.12	4.04	3.98	3.58	3.65	3.58	3.60	3.54	3.56	3.57	3.59	3.68	3.66	3.70	3.70
(a) - (b)	0.29***	0.27***	0.22***	0.32***	0.32***	0.35***	0.31***	0.27***	0.26***	0.20***	0.22***	0.23***	0.22***	0.21***	0.26***
Number of observations	1,911	2,032	1,908	1,863	2,047	2,071	2,205	2,002	2,610	2,531	2,045	2,479	2,111	2,543	30,358
(Life) insurance companies															
(c) Narrow-scope trust	4.32	4.28	4.21	3.83	3.93	3.82	3.84	3.82	3.92	3.98	3.98	4.06	3.71	3.68	3.93
(d) Broad-scope trust	4.06	4	3.98	3.63	3.74	3.64	3.60	3.64	3.74	3.76	3.76	3.85	3.68	3.66	3.76
(c) - (d)	0.26***	0.28***	0.23***	0.20***	0.18***	0.18***	0.24***	0.18***	0.19***	0.21***	0.22***	0.21***	0.03**	0.02*	0.17***
Number of observations	835	866	839	739	814	817	837	721	1,072	884	671	789	1,429	1,780	13,093
Pension funds															
(e) Narrow-scope trust	4.04	4.12	4.17	3.63	3.79	3.59	3.42	3.43	3.49	3.55	3.60	3.60	3.68	3.67	3.68
(f) Broad-scope trust	3.85	3.91	3.95	3.37	3.57	3.34	3.13	3.20	3.28	3.38	3.38	3.43	3.47	3.46	3.46
(e) - (f)	0.18***	0.21***	0.22***	0.25***	0.22***	0.26***	0.29***	0.24***	0.20***	0.17***	0.22***	0.17***	0.21***	0.22***	0.22***
Number of observations	1,286	1,367	1,343	1,315	1,502	1,537	1,694	1,518	2,001	1,827	1,575	1,863	1,546	1,839	22,213

Note: ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively (one-sided paired t-test).

Table B.3 Alternative measures of broad-scope trust (2019 only)

	<i>Trust in the financial sector</i>		<i>Trust in the financial sector 2</i>	
	(1a)	(1b)	(2a)	(2b)
<i>Financial knowledge</i>	0.26*** (0.07)	0.13* (0.07)	0.27*** (0.07)	0.19** (0.08)
<i>Male</i>	-0.25*** (0.09)	-0.52*** (0.10)	0.03 (0.10)	-0.17 (0.11)
<i>Between 35 and 44</i>	-0.01 (0.18)	-0.06 (0.19)	0.25 (0.20)	0.27 (0.21)
<i>Between 45 and 54</i>	-0.29* (0.17)	-0.34* (0.18)	-0.12 (0.18)	-0.16 (0.20)
<i>Between 55 and 64</i>	-0.35** (0.18)	-0.40** (0.19)	-0.02 (0.19)	0.01 (0.20)
<i>65 and over</i>	-0.03 (0.19)	-0.25 (0.20)	0.14 (0.20)	0.03 (0.21)
<i>Education: bachelor or higher</i>	0.05 (0.10)	-0.22* (0.11)	0.27** (0.11)	0.10 (0.12)
<i>Income: EUR 1151-1800</i>	-0.22 (0.24)	-0.34 (0.25)	0.07 (0.24)	0.11 (0.26)
<i>Income: EUR 1801-2600</i>	-0.09 (0.23)	-0.21 (0.24)	0.29 (0.23)	0.33 (0.25)
<i>Income: > EUR 2600</i>	0.06 (0.25)	-0.17 (0.25)	0.49** (0.24)	0.44* (0.26)
<i>Job</i>	0.17 (0.14)	0.13 (0.14)	0.14 (0.14)	0.12 (0.16)
<i>Homeowner</i>	0.31** (0.13)	0.18 (0.13)	0.26** (0.13)	0.15 (0.14)
<i>Household head lives with partner</i>	-0.06 (0.13)	0.07 (0.13)	-0.28** (0.13)	-0.23 (0.14)
<i>Degree of urbanization</i>	-0.00 (0.04)	-0.02 (0.04)	-0.01 (0.04)	-0.03 (0.05)
<i>Region: north</i>	-0.10 (0.15)	-0.10 (0.16)	0.06 (0.18)	0.11 (0.19)
<i>Region: east</i>	-0.03 (0.14)	0.02 (0.14)	0.09 (0.14)	0.16 (0.15)
<i>Region: south</i>	0.03 (0.13)	0.16 (0.13)	0.07 (0.13)	0.19 (0.14)
<i>Risk aversion</i>	-0.04 (0.05)	-0.03 (0.05)	-0.01 (0.05)	-0.01 (0.06)
<i>Trust in the supervisor</i>		2.11*** (0.11)		1.71*** (0.12)
Constant			-1.36*** (0.44)	-5.89*** (0.58)
Number of observations	1,777	1,777	1,779	1,777
Wald χ^2	42.90***	423.28***	57.39***	237.28***
Period	2019	2019	2019	2019
Model	Ordered logit	Ordered logit	Logit	Logit

Note: The table reports parameter estimates. Standard errors are clustered by household and shown in parentheses. The dependent variables of models (1) and (2) range from 1 (absolutely no trust) to 4 (a lot of trust). The dependent variable of models (3) and (4) are binary dummies (1 = trust, 0 = no trust). ***, ** and * denote statistical significance at the 0.01, 0.05 and 0.10 level respectively.

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