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Trust and Financial Crisis Experiences

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Abstract Using eight annual household surveys for the Netherlands between 2006 and 2013, we find that respondents' personal adverse financial crisis experiences do not only reduce their trust in banks, but also have an immediate negative effect on generalized trust. Respondents who were customers of a bank that ran into problems have less trust in banks than respondents without this experience. Respondents who were customer of a bank that failed have a significantly stronger decline of generalized trust than other respondents. Our results also suggest that personal financial crisis experiences do not have a significant direct effect on trust in the banking supervisor.

Keywords Trust in financial firms · Generalized trust · Bank bailout · Bank failure · Financial crisis · Households · Survey data

JEL Classification D10 · D84 · E58

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1 Introduction

In the wake of the global financial crisis, the general public's trust in financial institutions declined sharply.¹ Sapienza and Zingales (2015) find that only 27 % of Americans trust the financial system.² According to a 2012 poll by Gallup, trust in financial institutions was also low in Europe. Less than 30 % of Europeans trusted banks or financial institutions, far below the median of 55 % in a sample of 135 countries. Trust was lowest among Greeks of whom only 13 % trusted financial institutions. But also in Germany trust was low: only 38 % of Germans trust their financial institutions (Crabtree 2013).³

For policymakers, it is important to understand which factors are related to trust in financial institutions. A sudden decline of trust in the financial sector may, for instance, threaten financial stability due to the increased likelihood of bank runs (Guiso 2010). Likewise, it may hamper financial intermediation (Knell and Stix 2009). Using survey data from ten Central, Eastern and Southeastern European countries, Stix (2013) reports that trust in banks affect peoples' decisions how to save.

Despite its importance, there is only limited research on the drivers of trust in financial institutions.⁴ Using eight annual household surveys for the Netherlands between 2006 and 2013, we examine whether respondents' personal adverse financial crisis experiences are related to their trust in banks and the banking supervisor and to generalized trust. The paper that comes closest to our research is Knell and Stix (2009) who identify subjective variables, such as individuals' assessment of their current and future financial positions, as important drivers of trust in banks in Austria. However, these authors do not consider crisis experience of respondents, nor do they link their subjective variables to generalized trust. Using several surveys, Guiso (2010) points to fraud, such as the Madoff case, as a reason for the collapse of trust in US banks. Stevenson and Wolfers (2011) document how trust in a number of institutions, including banks, has fallen sharply during the Great Recession, and point to rising unemployment as a possible explanation for this development. Carbó-Valverde et al. (2013) find that trust in Spanish banks is strongly affected by perceptions of several performance characteristics and attributes of banks.

In a recent analysis, Jansen et al. (2015) examine what could drive a sudden loss of trust in financial institutions. They present members of the Dutch general public with eight hypothetical scenarios related to the financial crisis and ask to what extent these events would harm trust in their banks. Jansen et al. report that large bonuses are an important reason why people would lose trust in financial institutions, while negative media reports, a drop in share prices, and opaque product information are also relevant factors. A finding closely related to the present paper is that negative experiences with the financial sector during the crisis years affect how respondents assess the various scenarios. For instance, having the experience of being a client of a bank that failed during the crisis results in greater concerns regarding bonuses. A major difference with the study of Jansen et al.

¹ Also trust in central banks has declined. See Ehrmann et al. (2013) for an analysis of trust in the European Central Bank.

² Source: <http://www.financialtrustindex.org/resultswave22.htm>. URL last accessed 6 March 2015.

³ Source: <http://www.gallup.com/poll/162602/european-countries-lead-world-distrust-banks.aspx>. URL last accessed 4 July 2013.

⁴ In contrast, there is more research on trust in public institutions. For instance, Marozzi (2014) uses the European Social Survey to construct an index of trust in public institutions in Europe. Likewise, several studies examine trust in government (e.g. Poznyak et al. 2014). Kong (2013) provides a further discussion of this strand of literature.

(2015) is that in the present paper respondents are directly asked about their trust in banks and the banking supervisor instead of being presented with hypothetical scenarios.

In addition, we analyze whether the respondents' experiences during the crisis affect generalized trust. Generalized trust refers to trust in other people with whom there is no direct relationship. This form of trust can be contrasted with particularized trust, which arises when people are in direct contact with each other. Generalized trust is crucial for the functioning of market economies (Arrow 1972; Putnam 1993; Fukuyama 1995; and Alesina and La Ferrara 2002). 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 World Values Survey: 'In general, do you think that most people can be trusted, or can't you be too careful in dealing with people?'⁵

Several studies find evidence of a positive relationship between generalized trust and economic performance. Using data from the World Values Survey for 29 market economies, Knack and Keefer (1997) find that trust positively correlates with economic performance. Similar results are reported by Neira et al. (2009) for a sample of fourteen OECD countries. The analysis of Zak and Knack (2001) suggests that low trust-environments lead to lower rates of investment. For U.S. states, Dincer and Uslaner (2010) find that a ten percentage points increase in trust increases GDP growth by half a percentage point.⁶ Generalized trust is also related to other important variables, such as general wellbeing (cf. Helliwell et al. 2014), the quality of the government and corruption (see Horváth 2013 and Bjørnskov and Méon 2013 for further evidence and discussions of the literature). Liang and Lim (2013) find that generalized trust is also an important determinant of a range of financial choices made by households, such as how much debt to take on, and whether or not to file for bankruptcy.

Although several studies have examined the determinants of generalized trust, the concept of generalized trust has, to the best of our knowledge, not been related to personal financial crisis experiences. There are two recent related papers. Uslaner (2014) reports that in the United States the economic crisis had a greater impact on trust in the government than on generalized trust. Ananyev and Guriev (2015) find that economic crises in Russia have an immediate, substantial, and lasting effect on generalized trust. However, both papers do not take personal financial crisis experiences into account. Therefore, their results are not directly comparable to ours.⁷

Our findings are as follows. First, we find evidence that personal adverse experiences during the financial crisis directly affect trust in banks. Second, crisis experiences also have

⁵ For further details we refer to Banfield (1958), La Porta et al. (1997), Bjørnskov (2007) and Uslaner (2002, 2013) and references therein. Bjørnskov and Sønderskov (2013) offer a critical discussion of the concept.

⁶ Some studies reach more qualified conclusions on the relationship between trust and performance. Roth (2009) argues that increasing trust may be detrimental for economic performance when trust starts from a high level. Dearmon and Grier (2011) find that promoting investment through institutional reform is less effective when trust is high.

⁷ Some other papers focus on cross-country differences in generalized trust. For instance, Bjørnskov (2007) considers several potential determinants of cross-country differences in trust. In line with Uslaner (2002), he concludes that income inequality is the most important determinant of generalized trust. Likewise, using individual panel data for Swedish counties, Gustavsson and Jordahl (2008) find that income inequality is an important driver of generalized trust. They also report that the proportion of foreign-born inhabitants in a geographical region is negatively related to trust. Based on data for U.S. localities, Alesina and La Ferrara (2002) reach a similar conclusion. These authors also find that low generalized trust is related to recent traumatic experiences, such as illness or divorce. From the perspective of the present study, it is interesting that their evidence also suggests that financial misfortune is closely associated with low trust.

a negative effect on generalized trust. Third, our evidence also suggests that the decline of trust in the banking supervisor is not significantly related to personal crisis experiences.

The rest of this paper is structured as follows. Section 2 presents the methodology and data. Section 3 shows the development of our trust measures over time, while Sect. 4 examines their relationship with respondents' crisis experiences. Section 5 concludes.

2 Methodology and Data

Using eight annual surveys on trust among Dutch households, we analyze the development of four different measures of trust: (1) trust in other people (generalized trust), (2) how often one considers the possibility of a bank failing, (3) the liquidity of one's own bank compared to banks in general, and (4) trust in the banking supervisor. We study the effect of personal crisis experiences by relating our trust measures to respondents' involvement in five recent events in the Dutch financial sector that concern either government support or bankruptcies of financial institutions.

2.1 Five Events During the Financial Crisis in the Netherlands

In the course of 2008 the global financial crisis deepened and ultimately reached a critical point in September of that year with the collapse of Lehman Brothers. Also the Dutch financial sector was affected. In October, Icesave—a branch of the Icelandic bank Landsbanki—was declared bankrupt. The Dutch deposit guarantee scheme was subsequently activated for account holders up to a maximum of €100,000. Eventually, the savings of only 529 out of 140,000 account holders were not fully covered by the deposit guarantee scheme (DNB 2009, p. 86). The bankruptcy of Icesave, the first bank failure in the Netherlands that affected a large part of the public since a long time, is our first crisis experience.

The second crisis experience is the nationalization of the Dutch part of Fortis/ABN AMRO on 3 October 2008. The problems of Fortis group were related to the financial crisis and the aftermath of the takeover of ABN AMRO. Although the nationalization had no direct negative consequences for account holders, it did have a large impact on the public debate on the financial sector. Third, also in late 2008, the Dutch government took various other measures in support of financial stability. These measures included a large capital facility for financial firms that were fundamentally sound but that encountered problems as a result of the crisis. The facility was used, among others, by ING Group and SNS Reaal, which were among the four big banks in the Netherlands (DNB 2009, p. 84).

After 2008, two more financial institutions got into trouble. DSB Bank, a relatively small Dutch bank, was declared bankrupt on 19 October 2009. DSB Bank had already been placed under special surveillance in mid-2007 (DNB 2010). The failure of DSB Bank has since been reviewed by a committee, which concluded that the bankruptcy was primarily related to insufficient governance mechanisms and an unsustainable business model.

The final crisis experience is the nationalization of SNS Reaal on 1 February 2013. The Dutch government nationalized SNS Reaal, a bank and insurer conglomerate that includes brands like ASN Bank, SNS Bank and RegioBank, after various alternatives to rescue the institution had been examined. The nationalization was a measure of last resort (DNB

2014). It will be interesting to see whether this nationalization that took place after a relatively calm period had different effects on trust than the earlier four crisis experiences.

2.2 Surveys

The analysis mainly builds on eight waves of surveys, which were submitted to members of the CentERpanel of 16 years or older. This Internet panel is composed of more than 2000 households and was established in 1991. There is no intervention of an interviewer, so respondents can answer questions at their own convenience. CentERdata—a research institute affiliated to Tilburg University—manages the panel and makes sure that it is an appropriate representation of the Dutch-speaking population in the Netherlands. A simple computer with Internet access is given to households that do not have a computer and/or internet access. CentERdata also takes care that respondents are motivated to complete questionnaires seriously and to remain a panel member for several years such that the collected data can be used for longitudinal research.⁸

The questions on trust were submitted between early 2006 and early 2013 to members of the panel. In the March 2010 questionnaire we added a number of questions on personal crisis experiences. We identify respondents who had savings at one of the banks that either received government support or went bankrupt in 2008/2009 to examine whether they have different views on trust than other respondents. In the March 2013 trust questionnaire we included a set of additional questions on respondents' crisis experiences with respect to the nationalization of SNS Reaal to examine the impact of this particular crisis experience.

Appendix 1 lists the relevant questions used in this research. The 2006 trust questionnaire was returned in February, whereas all other trust questionnaires were held in March. Appendix 2 includes a table with detailed information on the timing of the survey, the selected number of households, the number of respondents and the response rate. The response rate ranges between 72 % in 2013 and 85 % in 2010 and is on average 78 %. On average 2060 respondents filled in the trust questionnaires. The response rate is high compared to other types of surveys but in line with other studies using this panel and not exceptional for Internet surveys.

We combine the results of these surveys with background variables available from the annual Dutch Household Survey (DHS), which also uses the CentERpanel. The DHS is a panel study initiated in 1993 by CentERdata. It consists of six questionnaires. These questionnaires include questions on work and pensions, housing and mortgages, income and health, assets and debt, and economic and psychological concepts. The DHS also includes information on personal characteristics. The DHS is frequently used to analyze psychological and economic aspects of financial behavior.⁹ For more information on

⁸ Information on the CentERpanel is available at <http://www.centerdata.nl/en/about-centerdata/what-we-do/data-collection/centerpanel>. URL last accessed on 18 February 2015.

⁹ The CentERpanel and DHS have been used in several recent articles such as Van Rooij et al. (2011, 2012) and Van der Cruysen et al. (2012, 2013a). Van der Cruysen et al. (2012) examine how crises experiences affected respondents' saving decisions. They report that respondents who were customers of troubled banking institutions were subsequently more likely to spread their savings across accounts at several banks. Likewise, these respondents were also more likely to move funds across banks. Finally, Van der Cruysen et al. find that the size of the shock is important as the strongest effects are found for respondents who experienced both a bank bailout and a bankruptcy. Van der Cruysen et al. (2013a) use the DHS to examine what the general public knows about banking supervision. They conclude that the public's knowledge about banking supervision is far from perfect and that respondents often expect more from supervisors than they can realistically achieve. In addition, their findings suggest that better-informed people have more realistic views on banking supervision.

methodological issues concerning the CentERpanel and DHS we refer to Teppa and Vis (2012). De Bruine et al. (2014) document the data management and preservation policy of the DHS.

Due to non-response, characteristics of respondents can differ from those of the entire population. We compare personal characteristics of the respondents to those of the Dutch population (Appendix 2). On average respondents turn out to be slightly older and higher educated. Their household size is somewhat higher. Of our respondents 53 % is male, whereas 49 % of the Dutch population of 16 years and older is male. The median net household income in our survey is slightly lower than the median disposable household income of the population.

As pointed out by Van der Cruijssen et al. (2012), a potential concern regarding our data source is that participants may be aware that the survey is affiliated to De Nederlandsche Bank (DNB), i.e., the supervisor of financial institutions. However, as CentERdata handles all contacts with the survey participants, and it is not mentioned in our questionnaire that DNB has commissioned the survey, it seems more likely that, if anything, participants associate the survey with CentERdata rather than DNB.

2.3 Dependent Variables

We employ four different measures of trust. First, we use the outcomes to the survey question “Generally speaking would you say that most people can be trusted or that you cannot be too careful in dealing with people?” to construct our generalized trust variable (*trust in other people*). This question is very similar to the World Values Survey (WVS) question that is generally used to construct a measure of generalized trust (see Torpe and Lolle 2011 for a further discussion).¹⁰ It is equal to 1 for respondents who find that most people are to be trusted, and 0 for respondents who believe that one cannot be careful enough.

The next two variables *thought about bank failure* and *view on bank liquidity* measure trust in banks.¹¹ *Thought about bank failure* is based on the answers to the question: “During the past year have you ever thought about the possibility that banks in the Netherlands might go bankrupt?” The scale ranges from 1 (never) to 4 (very often). To construct the variable *view on bank liquidity*, we use the outcomes of two questions: (1) “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?” and (2) “In general, do you trust that banks in the Netherlands are able to repay deposits at all times?” Then we subtract the score on question 2 from the score on question 1.

Our final trust measure is *trust in banking supervisor*. It uses the answers to the survey question “How much trust do you have in De Nederlandsche Bank?” The scale for *trust in banking supervisor* ranges from 1 for respondents who answer “absolutely no trust” to 4 for those who answer “a lot of trust”.

2.4 Variables for Crisis Experience

Using the 2010 and 2013 survey outcomes, we construct three crisis variables: *year after bailout*, *year after bankruptcy*, and *bailout in 2013*. We also include the interaction of the

¹⁰ Van Beuningen and Schmeets (2013) construct an index for social capital for the Netherlands, which includes generalized trust using a similar question.

¹¹ Respondents who answer “I don’t know” are not included in the analyses.

first two variables to examine whether respondents who experience both a bail-out and a bankruptcy of their bank are even stronger affected in terms of trust. This is motivated by the finding of Van der Crujisen et al. (2012) that respondents who had both crisis experiences changed their saving behavior most. In 2010 we asked the respondents whether they were a customer of a bank which went bankrupt or received government support in 2008/2009. In 2013 we asked respondents whether they had savings at ASN Bank, SNS Bank, and/or RegioBank, which were all part of SNS Reaal that was nationalized in 2013. Appendix 1 lists the relevant questions.

Year after bailout is a dummy that is 1 for respondents who were customer of a bank that was bailed out in 2008, and 0 else (apart from the bailout of SNS Reaal in 2013, all bailouts occurred in 2008). In 2009 *year after bailout* is 1 for 44 % of the respondents. In the other years *year after bailout* is 0 for all respondents. Similarly, *year after bankruptcy* is a dummy that is 1 for respondents who were customer of a bank that went bankrupt in the previous year, and 0 else (respondents reported whether their bank went bankrupt). In 2009 *year after bankruptcy* was 1 for 4 % of the respondents and in 2010 it was 1 for 7 % of the respondents. *Bailout in 2013* is a dummy that is 1 in 2013 for respondents who were customer of ASN Bank, SNS Bank, and/or RegioBank (all part of SNS Reaal), and 0 else. *Bailout in 2013* is 1 for 14 % of the respondents in 2013 and 0 for all respondents in other years.

2.5 Control Variables

We analyze the effects of adverse crisis experiences while controlling for a wide range of other factors. Appendix 3 provides details of the data used. We have a rich set of background characteristics from the DHS, which we use to construct control variables. We include: *age* (measured using 3 categories), *male*, *income*, *education*, *house owner*, and *handles finance*. For *age*, we use three dummy variables: (1) *younger than 35*, (2) *between 45 and 64*, (3) *older than 65*. The baseline category consists of respondents between 35 and 44. *Male* is a dummy that is one if the respondent is male. *Income* is the gross monthly personal income category, which ranges from 1 (500 euro or less) to 12 (7500 euro or more). Appendix 3 provides information on the range of each category. *Education* is a dummy that is 1 for respondents who successfully completed higher vocational education and/or university education, and 0 otherwise. *Handles finance* is a dummy variable that is 1 for respondents responsible for the household's financial affairs and 0 otherwise, while *home-owner* is a rough proxy for the level of wealth; it is 1 for respondents owning a house, and 0 otherwise. *Paid job* is a dummy reflecting whether the respondent has a paid job. *Household size* measures the number of members of the household. We include region variables as well. *City* measures the degree of urbanization of the respondent's residence. *Region west*, *region north*, *region east* and *region south* are four dummies that indicate where respondents live. For example, *region west* is 1 for respondents who live in the west of the Netherlands and 0 for other respondents. Respondents who live in Amsterdam, Rotterdam or The Hague (the three largest cities of the Netherlands) or their metropolitan areas are in the reference group.¹²

¹² One could expand the set of control variables, for instance, by including information on the amount of financial assets and the number of accounts. When we include these variables in the regressions, our general conclusions hardly change. However, the number of observations is reduced substantially. We thank the referee for this suggestion.

2.6 Regression Specification, Timing Issues and Selection of Sample Period

We analyze the effects of crisis experiences by estimating random effects (ordered) probit regressions using the four trust measures as dependent variables. We run two sets of regressions by distinguishing two time periods. The first period covers 2006–2012 to analyze the effect of the first four crisis experiences as discussed in Sect. 2.1 which were measured by the 2010 questionnaire. Here we can use both information on trust developments over time and differences between individuals and test whether effects are stronger if respondents experienced both a bailout and bankruptcy. The 2006–2012 regressions include year dummies to control for year-specific changes in trust that are unrelated to individual-specific characteristics and respondents' crisis experiences. The second period covers 2013. The regressions are used to analyze the effects of the fifth crisis event (the nationalization of SNS Reaal), which was measured by the 2013 questionnaire.

We also ran panel regressions for the period 2006–2013, with qualitatively similar findings (see Appendix 4). However, we prefer the outcomes for the two sets of regressions separately. There is a substantial degree of panel attrition between the surveys on crisis experiences in 2010 and 2013, leading to a loss of about 800 out of 2000 observations. This raises a concern about the representativeness of the sample. We especially lose a large portion of the individuals who report having experienced a bankruptcy. Thus, we would have to draw conclusions on a relatively small set of individuals with this type of crisis experience.

It is important to note that we study the direct effect of personal crisis experiences on trust. Timing is an important issue. Three dependent variables measure the level of trust at the moment of the survey (*trust in other people*, *view on bank liquidity*, *trust in banking supervisor*), whereas one measure refers to trust in the year up to the survey moment (*thought about bank failure*). We test whether (1) crisis experiences in the last quarter of 2008 affected trust in March 2009, (2) crisis experiences in October 2009 affected trust in March 2010,¹³ and (3) whether the nationalization of SNS Reaal on February 1st 2013 affected trust in March 2013. In the third test, the period between the measurement of *trust in other people*, *view on bank liquidity*, *trust in banking supervisor* and the crisis experience is smaller than in the first two tests. As a consequence, the effects that we find in the first and second test may be biased downwards because we don't have information on trust immediately after the event. Due to the availability heuristic (Tversky and Kahneman 1973) it may therefore be easier to find an effect in the third test than in the first two tests. According to this heuristic, people tend to weigh recent information more heavily because it can be recalled easily. However, all crisis events got a lot of media attention so that it is likely that respondents recall them. Although the *thought about bank failure* variable refers to a period in which the crisis events happened the availability heuristic may play a role here too and may make it more likely that we find an effect in the third test than in the first two tests.

3 Description of Trust in Others, Banks, and the Banking Supervisor

3.1 Trust in Other People

The top-left panel in Fig. 1 shows the share of people who find that most other people are to be trusted. It is based on the outcomes of the survey question: "Generally speaking

¹³ If there is no direct effect on trust from these two major events, it is not likely that crisis experiences will have an impact in later years.

Fig. 1 Trust before and during the financial crisis. *Note* This figure shows average levels of trust for the years between 2006 and 2013. The *top left panel* summarizes whether respondents have trust in other people (measured on a 0,1 scale). The *top right panel* shows how often respondents consider the possibility of a bank failing, measured on a scale between 1 (never) and 4 (quite often). The *bottom left panel* summarizes trust in the liquidity of one's own bank compared to banks in general, where positive values indicate more trust in one's own bank. The *bottom right panel* summarizes trust in the banking supervisor, measured on a scale between 1 (low trust) and 4 (high trust). The data is based on annual surveys among the Dutch public in the spring of each year. Data for 2007 on the possibility of a bank failure is not available

would you say that most people can be trusted or that you cannot be too careful in dealing with people?" Since the outbreak of the crisis in 2008, trust in others clearly decreased; the share of respondents trusting other people declined from 70 % in 2009 to 65 % in 2010. In 2013, generalized trust did, however, return to a level of 69 %. This level of generalized trust was last seen in 2007.

3.2 Trust in Banks

Due to the financial crisis public trust in financial institutions declined too. The top right panel in Fig. 1 shows the mean response to the question: "During the past year have you ever thought about the possibility that banks in the Netherlands might go bankrupt?" which is measured on a scale between 1 (never) and 4 (quite often). People have started to think more frequently about the possibility of bankruptcy of banks. The increase was especially strong after 2008/2009, when several banks in the Netherlands either failed or were bailed out.

The bottom left panel summarizes trust in the liquidity of one's own bank compared to banks in general. For the whole period respondents, on average, trust their own bank more than banks in general. However, there is significant variation over time. After the start of the crisis, relative trust in one's own bank increased. This is because trust in the liquidity of banks in general declined more than trust in the liquidity of one's own bank. However,

more recently trust in the liquidity of one's own bank declined more than trust in the liquidity of banks in general.

3.3 Trust in the Banking Supervisor

The bottom right panel in Fig. 1 shows the average response to the question: “How much trust do you have in De Nederlandsche Bank?” which is measured on a scale between 1 (low trust) and 4 (high trust). It used to be the case that the Dutch banking supervisor was highly trusted by the public. Between 2006 and 2008 trust in DNB was high and stable. However, after the bankruptcy of Icesave (October 2008) and DSB (October 2009) trust in the banking supervisor declined sharply. In 2012 trust in DNB increased somewhat, but this trend was reversed after the nationalization of SNS Reaal in 2013.

4 Explaining Trust: Regression Results

4.1 2008 and 2009 Crisis Experiences

First, we analyze to what extent the experiences of respondents during 2008/2009 (the first four events discussed in Sect. 2.1) had an impact on our trust measures. Table 1 shows the estimated coefficients of random effects (ordered) probit regressions using four different trust measures as dependent variable: *trust in other people* (column 1), *thought about bank failure* (column 2), *view on bank liquidity* (column 3), and *trust in banking supervisor* (column 4). Based on the estimations, Fig. 2 shows the estimated probabilities of falling in particular categories given different degrees of crisis experiences, from having experienced no crisis experience to both bankruptcy and bailout. Thus, marginal effects can be evaluated by viewing the differences in the heights of the bars across the horizontal axis.

As to our main variables of interest, we find that crisis experiences matter for trust in other people and trust in banks. Respondents who were customer of a bank that was bailed out in 2008 are less positive about the relative liquidity position of their own bank than respondents without this experience. Likewise, respondents who were customer of a bank that failed are less likely to trust other people and are more likely to have considered the possibility of a bank failure and are less positive about the liquidity position of their own bank.

Even though trust in DNB declined sharply after the 2008 and 2009 crisis events, we do not find a significant relationship between direct crisis experiences and trust in the banking supervisor. This implies that the decline in trust did not differ significantly between people with personal crisis experiences (bailout or bankruptcy of their bank) and people without such experiences.

Turning to the control variables, we see that age is not significant in the model for generalized trust. The findings of previous studies on the relationship between age and trust are mixed. For example, Hooghe et al. (2009) show that older people are more likely to trust people, while Kaasa and Parts (2008) find no significant effect of age on generalized trust. We find that older people are more likely to consider the possibility of a bank failure. In addition, they are more positive about the relative liquidity position of their bank.

Females have a higher level of generalized trust than males. Previous evidence on the relationship between gender and generalized trust is mixed. While some cross-country studies find that females have a lower level of trust in others than males (Van Oorschot

Table 1 Crisis experiences and trust (2006–2012)

	(1) Trust in other people	(2) Thought about bank failure	(3) View on bank liquidity	(4) Trust in banking supervisor
<i>Crisis experiences</i>				
Year after bailout	−0.05 (0.11)	0.02 (0.07)	−0.33*** (0.08)	0.10 (0.08)
Year after bankruptcy	−0.44*** (0.15)	0.33*** (0.11)	−0.22* (0.11)	0.06 (0.10)
Year after bailout × year after bankruptcy	0.55 (0.37)	0.08 (0.33)	0.05 (0.27)	−0.14 (0.35)
<i>Covariates</i>				
<i>Age</i>				
Younger than 35	−0.11 (0.11)	−0.06 (0.07)	0.02 (0.06)	−0.05 (0.06)
Between 45 and 64	−0.06 (0.10)	0.07 (0.06)	−0.06 (0.05)	0.03 (0.05)
Older than 65	−0.15 (0.13)	0.19** (0.08)	0.11* (0.07)	0.05 (0.08)
Male	−0.37*** (0.11)	−0.01 (0.05)	−0.02 (0.04)	0.19*** (0.05)
Income	0.09*** (0.02)	0.00 (0.01)	0.00 (0.01)	0.05*** (0.01)
Education	0.69*** (0.11)	0.14*** (0.05)	0.03 (0.04)	0.20*** (0.05)
Home-owner	0.32*** (0.11)	0.12** (0.06)	−0.04 (0.04)	0.12** (0.06)
Handles finances	0.20** (0.10)	−0.06 (0.05)	0.09** (0.04)	0.19*** (0.05)
Household size	0.01 (0.04)	−0.02 (0.02)	−0.02 (0.02)	−0.02 (0.02)
Paid job	0.09 (0.09)	0.01 (0.05)	0.01 (0.04)	−0.13** (0.05)
Observations	9968	8589	9727	9964
Number of individuals	2066	2053	2055	2066
Average observations per individual	4.8	4.2	4.7	4.8
Chi squared	286.9	1109.4	108.8	814.1
p-value	0.00	0.00	0.00	0.00
McKelvey and Zavoina's Pseudo R^2	0.06	0.05	0.01	0.07

The table reports parameter estimates for a random effects probit regression in column 1 and random effects ordered probit regressions in columns 2, 3 and 4 with robust standard errors in parentheses. Dependent variables are variables indicating whether the respondent trusts other people (column 1), how often he/she considered the possibility of a bank failure (column 2), the degree to which he/she thinks his/her own bank has better liquidity than banks in general (column 3), and the degree of trust in the banking supervisor (column 4). Estimations include all covariates as described in Sect. 2, as well as dummies for the years 2007 to 2012. Coefficients of year dummies, city, and region dummies are not included in the table. The reference individual is a female, aged between 35 and 44, who lives in one of the three largest cities of the Netherlands or their metropolitan areas, who has not successfully completed higher vocational or university education, who does not own a home, who does not handle the household's finance, and who does not have a paid job

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Fig. 2 Effect of crisis experience on trust in 2006–2012. *Note* This figure shows the probability that a respondent falls within a particular answer category given the crisis experience. Estimated probabilities are based on the (ordered) probit models in Table 1

et al. 2006; Alesina and La Ferrara 2002), others find the opposite relationship (Hooghe et al. 2009) or no gender effect (Kaasa and Parts 2008). Gender is not significantly related to trust in banks but is significantly related to trust in the banking supervisor. Compared to poorer people, richer people are more likely to trust the banking supervisor and other people. The latter finding is in line with the outcomes of previous research (Van Oorschot et al. 2006; Alesina and La Ferrara 2002). Trust in the banking supervisor and other people is also relatively high for (1) home-owners in comparison to people who do not own a house, (2) more educated respondents in comparison to less educated respondents (which is a well-established finding in the literature, see Hooghe et al. 2012), and (3) respondents who take care of household finances in comparison to other respondents. More educated people are more likely to consider the possibility of bank failure than less educated people. Also home-owners are more likely to consider the possibility of bank failure than people who do not own a house. Respondents who are in charge of household finances are more positive about the relative liquidity position of their bank than respondents who are not in charge of household finances. The size of the household is never significant, while whether or not respondents have a paid job is only significantly related to trust in the banking

supervisor. Respondents with a paid job are less likely to trust the banking supervisor than respondents without a paid job.

4.2 2013 Crisis Experience

We also examine whether the recent crisis experience, i.e., the nationalization of ASN Bank, SNS Bank and RegioBank in 2013, had an effect on trust. Table 2 shows the estimated coefficients of (ordered) probit regressions with the four different trust measures as dependent variable: *trust in other people* (column 1), *thought about bank failure* (column 2), *view on bank liquidity* (column 3), and *trust in banking supervisor* (column 4). Figure 3 shows how the crisis experiences of respondents affect the estimated probabilities.

This more recent crisis experience also significantly affected trust. The results are in line with those presented in Table 1. Respondents who were customers of a bank that was bailed out are less positive about the relative liquidity position of their own bank than respondents without this experience and are more likely to have considered the possibility of a bank failure. Again, there is no significant relationship between the crisis experience and trust in the banking supervisor. In line with the findings reported in Table 1, generalized trust is not significantly affected by the experience of a bailout.¹⁴ The outcomes on the covariates generally confirm the findings reported in Table 1. Young respondents were less likely to consider the possibility of bank failure than respondents in the reference group, whereas respondents between 45 and 64 were less likely to trust the banking supervisor than respondents in the reference group. Again we find that males are less likely to trust other people than females. More educated respondents are significantly more positive about the relative liquidity position of their own bank than less educated people. Furthermore, our results suggest that respondents in charge of household finances are less likely to have considered the possibility of bank failure than respondents who were not in charge of household finances. We also find a significant effect of household size: large families are less likely to have considered the possibility of bank failure than small families.

5 Conclusions

Using household survey data for the Netherlands, we examine whether their personal financial crisis experiences affect respondents' trust in banks and the banking supervisor, as well as generalized trust. Our results suggest that customers of a bank that was bailed out or of a bank that went bankrupt are less positive about the relative liquidity position of their own bank than customers without this experience. In addition, they are more likely to have considered the possibility of bank failure than respondents without this experience. Furthermore, our results suggest that even though trust in the banking supervisor declined after the start of the financial crisis, personal financial crisis experiences do not have an effect on trust in the banking supervisor. In contrast, generalized trust is affected by respondents' crisis experiences: respondents who were customer of a bank that failed indicate a significantly stronger decline of generalized trust than respondents without this

¹⁴ As explained in Sect. 2, we prefer estimating separate regressions for the 2006–2012 period and for 2013. However, we have also estimated the models for the 2006–2013 period. Appendix 4 reports the results. The findings are comparable to those presented in Tables 1 and 2.

Table 2 Crisis experiences and trust (2013)

	(1) Trust in other people	(2) Thought about bank failure	(3) View on bank liquidity	(4) Trust in banking supervisor
<i>Crisis experiences</i>				
Bailout in 2013	−0.00 (0.09)	0.16** (0.07)	−0.19** (0.08)	0.08 (0.08)
<i>Covariates</i>				
<i>Age</i>				
Younger than 35	0.11 (0.12)	−0.33*** (0.10)	0.07 (0.10)	−0.09 (0.09)
Between 45 and 64	0.11 (0.09)	−0.07 (0.08)	0.01 (0.08)	−0.16** (0.08)
Older than 65	0.01 (0.12)	−0.13 (0.10)	−0.03 (0.10)	−0.04 (0.10)
Male	−0.13* (0.07)	−0.02 (0.06)	−0.00 (0.06)	0.05 (0.06)
Income	0.03** (0.01)	0.01 (0.01)	0.02 (0.01)	0.05*** (0.01)
Education	0.42*** (0.07)	0.13** (0.06)	0.13** (0.06)	0.17*** (0.06)
Home-owner	0.14* (0.08)	0.05 (0.06)	−0.02 (0.07)	0.11* (0.07)
Handles finances	0.13* (0.07)	−0.19*** (0.06)	0.11* (0.06)	0.20*** (0.06)
Household size	0.04 (0.03)	−0.05* (0.02)	−0.03 (0.02)	−0.03 (0.02)
Paid job	−0.01 (0.08)	−0.02 (0.07)	−0.09 (0.07)	−0.05 (0.07)
Observations	2009	1956	1937	2009
Chi squared	95.6	53.7	33.5	103.5
<i>p</i> -value	0.00	0.00	0.00	0.00
McKelvey and Zavoina's Pseudo R^2	0.04	0.01	0.00	0.02

Coefficients based on a probit regression in column 1 and ordered probit regressions in columns 2, 3 and 4 with robust standard errors in parentheses. Dependent variables are variables indicating whether the respondent trusts other people (column 1), how often he/she considered the possibility of a bank failure (column 2), the degree to which he/she thinks his/her own bank has better liquidity than banks in general (column 3), and the degree of trust in the banking supervisor (column 4). Estimations include the full set of covariates as described in Sect. 2. Coefficients of city and region dummies are not included in the table. The reference individual is a female, aged between 35 and 44, who lives in one of the three largest cities of the Netherlands or their metropolitan areas, who has not successfully completed higher vocational or university education, who does not own a home, who does not handle the household's finances, and who does not have a paid job

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

experience. However, there is no significant relationship between having experienced a bank bailout and generalized trust.

Our findings therefore suggest that negative crisis experiences have at least two detrimental effects. First, they reduce trust in the financial sector thereby threatening financial stability due to the increased likelihood of bank runs and possibly undermining financial

Fig. 3 Effect of crisis experience on trust in 2013. *Note* This figure shows the probability that a respondent falls within a particular answer category given the crisis experience. Estimated probabilities are based on the (ordered) probit models in Table 2

intermediation. Second, they reduce generalized trust, which may reduce economic growth.

Our research has some limitations. First, it refers to one country only. Future research for other countries could therefore examine whether our findings hold more generally. Second, although we measure generalized trust similarly to other studies, it may be criticized. According to Reeskens and Hooghe (2008: 519), “relying on a single item measurement amounts to skating on thin ice”. Third, our analysis of the impact of crisis experience on generalized trust could be broadened to include other dimensions of social capital. As pointed out by van Beuningen and Schmeets (2013), most research on social capital also includes participation in addition to trust. These two concepts are not strongly correlated. Future research could examine whether there is also a relationship between personal crisis experience and participation.

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Appendix 1

Survey Questions

*The 2010 Questionnaire*¹⁵

In the first part of this questionnaire you will first be asked a few questions about trust in general and then a few questions about trust in financial institutions. In the second part of this questionnaire you will be asked questions on banking supervision. In this questionnaire you can't scroll back to the previous question.

Q1

Generally speaking would you say that most people can be trusted or that you cannot be too careful in dealing with people?

- To be trusted
- One cannot be careful enough

Q2

How much trust do you have in...

	A lot of trust	Pretty much trust	Not so much trust	Absolutely no trust
De Nederlandsche Bank				
...				

Q3

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?

- Yes, completely
- Yes, predominantly
- Neutral
- No, predominantly not
- No, completely not
- I don't know/no opinion

Q4

In general, do you trust that banks in the Netherlands are able to repay deposits at all times?

- Yes, completely
- Yes, predominantly
- Neutral
- No, predominantly not
- No, completely not
- I don't know/no opinion

¹⁵ Q1, Q2, Q3, Q4 and Q4a are standard trust questions, which are asked every year. Q27 and Q28 are questions which were only asked in 2010 to measure crisis experiences.

Q4a

During the past year have you ever thought about the possibility that banks in the Netherlands might go bankrupt?

- No, never
- No, not often
- Yes, now and then
- Yes, very often
- I don't know/no opinion

...

Q27

During the past 3 years did a bank at which you were customer go bankrupt?

- Yes, DSB
- Yes, Icesave
- Yes, other...
- No

Q28

During the past 3 years did a bank at which you were customer survive with the help of government support?

- Yes
- No
- I don't know

...

*The 2013 Questionnaire*¹⁶

...

Q13

Did you have money at a savings account of a Dutch bank at the moment that this bank was nationalized in 2013 by the Dutch government?

- Yes
- No
- I don't know

if q13 = Yes

Q14

At which Dutch bank(s) did you have money on a savings account at the moment that this bank was (these banks were) nationalized in 2013 by the government? *[more than one answer is possible]*

¹⁶ These questions were included to measure recent crisis experiences (i.e., the nationalization of SNS Reaal).

- ASN Bank
- SNS Bank
- RegioBank
- Other

if $q14 = Other$

Q14 and

Which bank(s)?

...

Appendix 2

See Table 3.

Table 3 Description of trust surveys

Year	Month	Week	Selected number of household members ^a	Number of respondents	Response rate (%)
2006	February	5	2324	1944	84
2007	March	10	2825	2063	73
2008	March	10	2617	1957	75
2009	March	10	2365	1924 ^b	81
2010	March	10 and 11	2475	1668 + 435	85
2011	March	10	2869	2142	75
2012	March	11	2932	2272	77
2013	March	11	2889	2076	72
Summary statistics (average 2006–2013)					
			Survey	Total population	Difference
Mean age			51.9	46.9	5.0*
Sex (% males)			53.0 %	49.1 %	3.9 pp*
Education (% high)			37.1 %	27.1 %	10.0 pp*
Mean household size			2.6	2.2	0.4*
Median monthly household income (in 1000 euro)			2.3	2.5	0.1

Sources: CentERpanel and Statistics Netherlands

pp percentage points. The population education share is based on 2006–2012 information about the entire population of the Netherlands of 15–65 years old. For the survey the table shows the median monthly net household income and for the population it shows the median disposable income

* $p < 0.01$

^a Selected household members are members of the CentERpanel of 16 years or older

^b This includes three respondents who only answered Q1 on generalized trust

Appendix 3

See Table 4.

Table 4 Description of variables

Variable	Description	2006–2012				2013			
		Mean	Min	Max	SD	Mean	Min	Max	SD
<i>Dependent variables</i>									
Trust in other people	Binary dummy (1 = most people can be trusted, 0 = one cannot be careful enough in dealing with people)	0.67	0	1	0.47	0.69	0	1	0.46
Thought about bank failure	Measures how often respondents thought the past year about the possibility that banks in the Netherlands might go bankrupt (1 = never, 2 = not often, 3 = now and then, 4 = very often). I don't know/no opinion answers are set at missing	2.37	1	4	0.82	2.63	1	4	0.70
View on bank liquidity	The difference between two questions: (1) “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?” and (2) “In general, do you trust that banks in the Netherlands are able to repay deposits at all times?” Answers were coded such that respondents score from 1 (no, completely not) to 5 (yes, completely) on each question. I don't know/no opinion answers are set at missing	0.29	−3	4	0.64	0.27	−2	4	0.68
Trust in banking supervisor	The amount of trust that respondents have in De Nederlandsche Bank (1 = absolutely no trust, 2 = not so much trust, 3 = pretty much trust, 4 = a lot trust)	2.94	1	4	0.70	2.68	1	4	0.66
<i>Crisis experiences</i>									
Year after bailout	Binary dummy (1 = customer of a bank that was bailed out in the previous year, 0 = else)	0.069	0	1	0.24				

Variable	Description	2006–2012				2013			
		Mean	Min	Max	SD	Mean	Min	Max	SD
Year after bankruptcy	Binary dummy (1 = customer of a bank that went bankrupt in the previous year, 0 = else)	0.021	0	1	0.14				
Year after bailout × Year after bankruptcy	Interaction term	0.003	0	1	0.05				
Bailout in 2013	Binary dummy (1 = customers of ASN Bank, SNS Bank, and/or RegioBank, 0 = else)					0.14	0	1	0.34
<i>Covariates</i>									
Younger than 35	Binary age dummy (1 = younger than 35, 0 = else)	0.13	0	1	0.34	0.14	0	1	0.35
Between 45 and 64	Binary age dummy (1 = between 45 and 64, 0 = else)	0.46	0	1	0.50	0.40	0	1	0.49
Older than 65	Binary age dummy (1 = older than 65, 0 = else)	0.24	0	1	0.43	0.31	0	1	0.46
Male	Binary gender dummy (1 = male, 0 = female)	0.55	0	1	0.50	0.54	0	1	0.50
Income	Classification of gross monthly personal income in euros (1 = 500 or less, 2 = 501–1000, 3 = 1001–1500, 4 = 1501–2000, 5 = 2001–2500, 6 = 2501–3000, 7 = 3001–3500, 8 = 3501–4000, 9 = 4001–4500, 10 = 4501–5000, 11 = 5001–7500, 12 = 7500 or more)	4.84	1	12	2.78	5.0	1	12	2.87
Education	Successful completion of higher vocational education and/or university education. Binary dummy (1 = graduate level diploma, 0 = else)	0.37	0	1	0.48	0.42	0	1	0.49
Home-owner	Proxy for the level of wealth. Binary dummy (1 = owns a house, 0 = else)	0.75	0	1	0.43	0.76	0	1	0.43
Handles finances	Whether or not respondent is responsible for household's financial affairs. Binary dummy (1 = responsible for financial affairs, 0 = else)	0.66	0	1	0.47	0.67	0	1	0.47
Household size	The number of household members	2.56	1	8	1.29	2.47	1	9	1.24
Paid job	Job status (1 = paid job, work in family business or self-employed, 0 = else)	0.52	0	1	0.50	0.49	0	1	0.50

Variable	Description	2006–2012				2013			
		Mean	Min	Max	SD	Mean	Min	Max	SD
City	Degree of urbanization of respondent's residence based on the address density (1 = not urbanized, 2 = little urbanized, 3 = moderately urbanized, 4 = strongly urbanized, 5 = very strongly urbanized)	3.02	1	5	1.31	3.01	1	5	1.31
Region west	Binary region dummy (1 = living in the west of the Netherlands, 0 = else)	0.29	0	1	0.45	0.28	0	1	0.45
Region north	Binary region dummy (1 = living in the north of the Netherlands, 0 = else)	0.12	0	1	0.32	0.13	0	1	0.33
Region east	Binary region dummy (1 = living in the east of the Netherlands, 0 = else)	0.20	0	1	0.40	0.22	0	1	0.41
Region south	Binary region dummy (1 = living in the south of the Netherlands, 0 = else)	0.25	0	1	0.43	0.23	0	1	0.42

This table describes the variables used in the regressions reported in Tables 1 and 2, conditional on availability of all explanatory variables and “trust in other people”. $N = 9968$ for the 2006–2012 sample, except for “thought about bank failure” ($N = 8589$), “view on bank liquidity” ($N = 9727$), and “trust in banking supervisor” ($N = 9964$). For the 2013 sample, $N = 2009$ except for “thought about bank failure” ($N = 1956$) and “view on bank liquidity” ($N = 1937$). The reference individual is a female, aged between 35 and 44, who lives in one of the three largest cities of the Netherlands or their metropolitan areas, who has not successfully completed higher vocational or university education, who does not own a home, who does not handle the household's finances and who does not have a paid job. *Min* minimum, *max* maximum and *SD* standard deviation

Appendix 4

See Table 5.

Table 5 Random effects probit regressions for 2006–2013

	(1) Trust in other people	(2) Thought about bank failure	(3) View on bank liquidity	(4) Trust in banking supervisor
<i>Crisis experiences</i>				
Year after bailout	−0.05 (0.13)	−0.07 (0.09)	−0.33*** (0.09)	0.13 (0.10)
Year after bankruptcy	−0.33* (0.17)	0.21 (0.14)	−0.21 (0.14)	−0.01 (0.13)
Year after bailout * Year after bankruptcy	0.29 (0.46)	0.33 (0.37)	0.20 (0.30)	−0.23 (0.39)

	(1) Trust in other people	(2) Thought about bank failure	(3) View on bank liquidity	(4) Trust in banking supervisor
Bailout in 2013	−0.14 (0.15)	0.17* (0.10)	−0.12 (0.11)	0.01 (0.09)
<i>Covariates</i>				
<i>Age</i>				
Younger than 35	0.02 (0.13)	−0.12 (0.08)	−0.03 (0.07)	−0.06 (0.08)
Between 45 and 64	−0.02 (0.12)	0.03 (0.07)	−0.02 (0.05)	−0.02 (0.06)
Older than 65	−0.07 (0.15)	0.13 (0.09)	0.09 (0.07)	0.00 (0.09)
Male	−0.45*** (0.14)	−0.00 (0.07)	−0.00 (0.04)	0.18*** (0.07)
Income	0.06*** (0.02)	0.00 (0.01)	0.00 (0.01)	0.06*** (0.01)
Education	0.55*** (0.13)	0.16** (0.07)	0.05 (0.04)	0.15** (0.07)
Home-owner	0.37*** (0.13)	0.09 (0.07)	0.00 (0.05)	0.14** (0.07)
Handles finances	0.27** (0.12)	−0.11 (0.07)	0.09** (0.04)	0.25*** (0.06)
Household size	0.01 (0.04)	−0.02 (0.02)	−0.02 (0.02)	−0.00 (0.03)
Paid job	0.18* (0.10)	0.01 (0.06)	−0.01 (0.05)	−0.11* (0.06)
Constant	−0.56 (0.35)			
Observations	8377	7400	8208	8373
Number of individuals	1286	1285	1285	1286
Average observations per individual	6.5	5.8	6.4	6.5
Chi squared	190.1	871.9	78.9	370.5
<i>p</i> -value	0.00	0.00	0.00	0.00
McKelvey and Zavoina's Pseudo R^2	0.06	0.11	0.01	0.12

The table reports parameter estimates for a random effects probit regression in column 1 and random effects ordered probit regressions in columns 2, 3 and 4 with robust standard errors in parentheses. Dependent variables are variables indicating whether the respondent trusts other people (column 1), how often he/she considered the possibility of a bank failure (column 2), the degree to which he/she thinks his/her own bank has better liquidity than banks in general (column 3), and the degree of trust in the banking supervisor (column 4). Estimations include the covariates as described in Sect. 2, as well as dummies for the years 2007–2013, city and region dummies. Coefficients of year dummies, city, and region dummies are not included in the table. The reference individual is a female, aged between 35 and 44, who lives in one of the three largest cities of the Netherlands or their metropolitan areas, who has not successfully completed higher vocational or university education, who does not own a home, who does not handle the household's finances and who does not have a paid job

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

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