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Does experience of banking crises affect trust in banks?

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Abstract

This paper investigates how past experience with banking crises influences an individual's trust in banks. We combine data on banking crises for the period 1970–2014 with individual data on trust in banks for 52 countries. We find that experiencing a banking crisis diminishes a person's trust in banks, and that high exposure to banking crises is negatively related to trust in banks. An individual's age at the time of the crisis is important, and significant for individuals between 41 and 60 years of age at the time of the banking crisis. Both severe and mild crises diminish trust in banks, but a severe banking crisis hits also young people's trust, while less severe banking crises mainly degrade trust of more mature people. The detrimental effect for trust in banks seems to be connected specifically to systemic banking crises. Other types of financial crises incur a less significant effect. Overall, our results indicate that banking crises generate previously unrecognized costs for the economy in the form of a lasting reduction of trust in banks.

JEL codes: G21, O16.

Keywords: banking, trust, banking crisis.

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1   Introduction

Trust in banks is a core determinant of financial system effectiveness. A high degree of confidence in banks improves participation in the financial system by contributing to the pooling of savings and expansion of credit by banks. Such trust is key to supporting financial development and an essential element to stability of the financial system (e.g. by reducing the danger and intensity of bank runs).

A set of recent works (Sapienza and Zingales, 2012; Knell and Stix, 2015; Fungáčová, Hasan and Weill, 2019) show that trust in banks fell sharply in countries hit hard by the Global Financial Crisis (GFC). While these studies suggest that the GFC eroded trust in banks, they were only able to uncover the short-term impact on trust in banks. We argue that trust tends to persist which indicates the possible long-term costs of banking crises. If such an effect is observed, it implies that the costs of banking crises generally measured through the loss of output and the fiscal costs generated by the crises underestimate the actual cost by ignoring this long-term loss of trust in banks.

Behavioral sciences help frame the discussion as to how banking crises affect trust in banks. Interpersonal trust is generally damaged by negative experiences (Coleman, 1990: Glanville and Paxton, 2007), so a negative experience with a financial institution is expected to deteriorate trust in banks. Actual breaches of trust alter expectations (Lewicki and Bunker, 1995; Kramer, 1999), so a banking crisis can alter an individual's expectations about how a breaching bank will behave toward them in the future. A reluctance to use financial services suggests a loss of confidence in banks.

The objective of this paper is twofold. On the one hand, we investigate whether experiences of banking crises influence the degree to which an individual trusts banks. On the other hand, we examine if the characteristics of the individuals and of the crises affect the impact on trust in banks.

We test whether the past experience of banking crises has an impact on the degree of trust in banks. We study whether the occurrence of at least one banking crisis in a lifetime and the exposure to banking crises (measured by the number of banking crises years in the lifetime divided by the number of banking crises[1]) influence trust in banks. To this end, we merge the dataset on banking crises from Laeven and Valencia (2018) with the last wave of the World Values Survey containing information on trust in banks and individual characteristics of respondents. Based on the respondent's age, we identify the past experience of banking crises for each individual.

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[1] This allows us to put more weight on longer lasting banking crisis, as a banking crisis lasting for four years has a double weight compared to two separate crises lasting for two years each.

We consider whether the age of the individual at the time of a banking crisis influences their loss of trust in banks. It has been shown that early experiences of crises can influence the beliefs of individuals including risk preferences (Malmendier and Nagel, 2011) and redistribution preferences (Giuliano and Spilimbergo, 2014). Crises experiences at a later stage in life can also influence trust in banks. Mudd, Pashev and Valev (2010) show that loss experiences in a banking crisis influence the behavior of individuals. A banking crisis may affect both the social memory and personal experience of individuals. It has a greater long-term effect on the beliefs of more mature people at the time of the crisis as they might encounter larger losses. Recent personal experiences can also affect personal decisions (Malmendier and Nagel, 2011).

Our paper contributes to several strands of the literature. First, it extends to the literature concerning the effects of crises on economic beliefs and behavior. Malmendier and Nagel (2011) show that experiences of macroeconomic shocks during the lifetime influence the risk-taking behavior of individuals, i.e. persons who have experienced low stock market returns are less willing to invest on stock markets. Giuliano and Spilimbergo (2014) find that individuals who have grown up during recessions are more supportive of income redistribution. Malmendier and Nagel (2016) show that individuals who have lived during period of high inflation also expect higher future inflation. This work concentrates on the impact of former experiences of banking crises in life on the current degree of trust in banks.

Our second contribution is to the literature on banking crisis costs. This literature confirms costs from loss of output (Kroszner, Laeven and Klingebiel, 2007; Dell'Aricia, Detragiache and Rajan, 2008; Devereux and Dwyer, 2016) and the fiscal costs of resolving the banking crisis (Amaglobeli et al., 2016; Laeven and Valencia, 2018; Lane, 2011). We consider a third source of banking crisis costs: the cost of a long-term reduction in confidence in banks. Mudd, Pashev and Valev (2010) find evidence for this cost in the specific context of the 1996 banking crisis in Bulgaria, where they observe that individuals who experienced losses during this crisis were more likely to expect a new banking crisis or to withdraw money in 2008. We provide a broader investigation at the world level for a large sample of banking crises.

Our final contribution is to the literature on trust in banks. Research on this topic remains limited with a few works studying the level and the determinants of trust in banks (Carbo-Valverde, Maqui-Lopez, and Rodriguez-Fernandez, 2013, for Spain; Jansen, Mosch and van der Cruisjen, 2014, for the Netherlands), including a handful of papers showing the detrimental influence of the Global Financial Crisis on trust in banks (Sapienza and Zingales, 2012, for the US; Knell and Stix, 2015, for Austria; Fungáčová, Hasan and Weill, 2019, in a cross-country analysis). We base our analysis on a larger sample of banking crises and countries.

Osili and Paulson (2014) investigate how exposure to banking crises influences the banking behavior of individuals living in the US. They consider the investment behavior of individuals who have migrated to the US by comparing individuals from the same country who either experienced or did not experience a crisis. They find that the experience of a banking crisis reduced the likelihood a person would open a checking account. We build on this discussion in three ways. First, we investigate the impact of former banking crises on trust in banks, thereby contributing to the understanding of what shapes trust in banks. Second, we sample populations from around the world to gain a more general perspective. Third, we analyze the influence of the individual's age at the time of the banking crisis and do not restrict our investigation to their early experiences.

The paper proceeds as follows. Section 2 presents the data and the methodology. Section 3 reports the main estimations. Section 4 provides additional estimations accounting for characteristics of crises. Section 5 displays robustness checks. Section 6 concludes.

2   Data and methodology

We merge two individual datasets to perform the study; the dataset on banking crisis from Laeven and Valencia (2018) and the last wave of the World Value Survey containing information on trust in banks and individual characteristics for 52 countries.[2]

Laeven and Valencia (2018) provide a dataset of 151 systemic banking crises episodes[3] globally during 1970–2017 with the information on crisis starting and ending dates, their resolutions and outcomes (including output loss and fiscal costs). In addition to systemic banking crises, the dataset includes information concerning the dates of currency crises and sovereign debt crisis. Altogether, the dataset contains crisis information for 165 countries.

The World Values Survey asks individual respondents about their perceptions of life and institutions. It contains a representative sample of the population for each country. The survey has been conducted six times since 1981, the last wave relying on a sample of respondents in 60 countries during the period of 2010–2014. This last wave includes an additional question V121 on trust in banks that drew responses from 52 countries. The question asks:

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[2] Our sample contains the following countries: Algeria, Armenia, Australia, Azerbaijan, Belarus, Chile, China, Colombia, Cyprus, Ecuador, Egypt, Estonia, Germany, Ghana, Iraq, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Libya, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Pakistan, Palestine, Peru, Philippines, Poland, Qatar, Romania, Russia, Rwanda, Singapore, Slovenia, South Korea, Spain, Sweden, Taiwan, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United States, Uruguay, Uzbekistan, Yemen and Zimbabwe.

[3] Laeven and Valencia (2018) define banking crisis as an event that meets two conditions. First, there are significant signs of financial distress in the banking system (significant bank runs, losses in the banking system, and/or bank liquidations). Second, significant banking policy intervention measures are taken in response to significant losses in the banking system. The first year that both criteria are met is the year when the crisis became systemic.

> *Could you tell me how much confidence you have in banks: Is it*
> *a great deal of confidence (1), quite a lot of confidence (2),*
> *not very much confidence (3) or none at all (4)?*

Using these responses, we define our main dependent variable *Trust in banks* that is available for 52 countries. We have recoded the four answers so that 1 translates to lowest confidence and 4 to highest confidence in banks. National mean values of this trust variable and a discussion of cross-country comparison can be found in Fungáčová, Hasan and Weill (2019).

For these 52 countries, we have a total of 66,293 individual responses with a mean trust in banks of 2.56. As we aim to study the effect past experiences of banking crises have on an individual's trust in banks, we utilize the information on the respondent's year of birth and merge this information with the banking crises database from Laeven and Valencia (2018).[4]

To create different crisis variables to account for the individual's past experience of a banking crisis, we first create a dummy variable that equals 1 if there has been at least one systemic banking crisis during the respondent's lifetime (*Systemic banking crisis*). Next, we compute the variable *Exposure to crises* (defined as the number of years the systemic banking crises lasted during the respondent's lifetime divided by the number of crises the respondent has lived through). This variable accounts for each individual's exposure to banking crises. We lastly investigate whether the age of an individual at the time of crisis matters. Here, we define two sets of dummy variables based on alternative age brackets. The narrow age brackets are from 0 to 10 years old, from 11 to 20 years old, from 21 to 30 years old, from 31 to 40 years old, from 41 to 50 years old, from 51 to 60 years old and older than 60 years. Each age bracket equals 1 if there was a systemic banking crisis in the country of residence when the respondent belonged to that specific age group. We also consider broad age brackets, such that the age of respondent was 0–20 years, 21–40 years, 41–60 years or over 60 years when the crisis occurred.

We further consider whether other financial crises than systemic banking crises may affect trust in banks. We redefine the crisis variable for the currency crises as defined in Laeven and Valencia (2018). For the 52 countries in our sample, 73% of respondents have experienced a systemic banking crisis during their lifetime (of those, 33% had experienced two crises). 61% of all respondents had experienced a currency crisis. We also account for a possibility of a twin crisis, i.e. a sim-

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[4] We assume that an individual lives his or her entire life in the country reported as residence in the survey. Less than 3% of respondents in our balanced panel declare themselves as immigrants, but we do not know the year they have entered the country. Dropping them from the estimations does not change the results. The estimation tables are available upon request.

ultaneous systemic banking crisis and currency crisis. It turns out that 45% of individuals who experienced a systemic banking crisis actually lived through a twin crisis. We create a dummy variable *Twin crisis* if a currency crisis takes place between the start and end of a systemic banking crisis.

2.1 Estimated equations

To determine whether the experience of a banking crisis affects trust in banks, we estimate an ordered logit model. This is because our dependent variable, *Trust in banks*, is a discrete variable with values between 1 and 4. We consider five specifications of the baseline model, each with different version of the main explanatory variable accounting for the crises. Specification 1 includes the crisis dummy variable indicating experience of crisis (*Systemic banking crisis*). Specification 2 looks at the exposure to the crises and includes the variable *Exposure to crises*. Specification 3 includes both the crisis dummy variable (*Systemic banking crisis*) from specification 1 and an additional dummy variable that equals one for individuals having experienced two crises (*Two crises*) in their lifetime. Specifications 4 and 5 include the two sets of age brackets variables. In all specifications, we control for individual characteristics. We consider gender, income, education, marital status and general trust. These indicators are in line with former studies on trust generally and trust in banks specifically. For gender, we define a dummy variable equal to 1 for females (*Female*). In the case of income, we use a scale from 1 to 10 based on the self-reported level of income of the respondent with 1 as the lowest income decile of the country and 10 the highest (*Income*). Education is a dummy variable that equals 1 for full secondary or tertiary education, and 0 for other respondents (*Education*). For marital status, we use a dummy variable that equals 1 if the respondent is married (*Married*), and 0 otherwise. *General trust* is a dummy variable that equals 1 if the respondent thinks most people can be trusted, and zero otherwise. Descriptive statistics for variables used in our estimations are reported in Table 1 and definitions of the variables in appendix (Table A1). In addition to individual characteristics we account for country differences by including country specific dummy variables in each estimation.

3 Results

This section presents the results on the impact of past experience of banking crises on trust in banks. We display the main estimations using an ordered logit model and complement them with the analysis of marginal effects.

3.1 Main estimations

We employ an ordered logit model to explain trust in banks. The dependent variable is *Trust in banks*, a discrete variable with values between one and four. Table 2 reports the results for five specifications of the main estimations.

   We first test whether the occurrence of a banking crisis during the lifetime of the individual influences his or her trust in banks. The estimated coefficients are reported in Column 1 of Table 2. We observe that the dummy variable for a systemic banking crisis is significant and negative. This means that experiencing a banking crisis has a negative impact on trust in banks. This accords with the work of Osili and Paulson (2014), who find that immigrants who have experienced a banking crisis in their country of origin are unlikely to open a checking account in the US.

   We then examine whether exposure to banking crises during the individual's lifetime affects his or her trust in banks. We account for all the banking crises in individual's life and their length to see how this individual exposure to crises influences confidence in banks. The estimation results are reported in Column 2 of Table 2. We find that the estimated coefficient concerning exposure to banking crises is significantly negative. Therefore, a higher exposure to banking crises in the lifetime is related to lower trust in banks.

   The specification in column 3 of Table 2 accounts for the individuals that have experienced two crises during their lifetime. We add to the main specification a dummy variable *Two crises* which equals one for individuals with two crises. The main result confirming negative relation between banking crisis and trust in banks is valid while the estimated coefficient for *Two crises* is not significant indicating that sheer experience of banking crisis in life is related to lower trust in banks and experience of two crises does not change this result.

   Based on these findings, our major conclusion is that experiencing banking crises erodes trust in banks. Actual experience of a banking crisis and higher exposure to banking crises both hamper trust in banks.

   We further investigate if the age of an individual at the time of the banking crisis matters for trust in banks. To this end, we consider different age groups defined based on the age at the time of crisis. We respectively define age groups using 10- and 20-year windows in Columns 4 and 5 of Table 2.

   With the narrow age brackets, we see that the experience of a banking crisis negatively affects trust in banks only if the crisis takes place when the individual is in the 41-50 or 51-60 age groups. All other age groups are not significant. The estimation with the broad age brackets confirms this finding since only the dummy variable for the age group 41-60 is significant and again negative.

These results indicate that the past experience of banking crises only deteriorates the degree of trust in banks when the individual is between 41 and 60 at the time of the crisis. It means that only trust in banks of mature people is affected by banking crises. Early life experiences of banking crises do not seem to have a long term effect on trust in banks. This result differs from those observed for the impact of economic recessions on redistribution preferences or risk preferences (Malmendier and Nagel, 2011; Giuliano and Spilimbergo, 2014).

We interpret this finding to mean that older individuals possibly suffer greater losses during banking crises so their trust in banks is more affected. This is in line with the finding from Mudd, Pashev and Valev (2010) that loss experiences in a banking crisis influence the behavior of individuals. Banking crises differ from economic recessions. They more greatly affect the personal experience of individuals than the collective memory as they have a more pronounced impact on those individuals suffering the most from losses associated with bank failures.

In analyzing other explanatory variables, we note that the estimated coefficient for *Female* is significantly positive, supporting the view that women trust banks more than men, and that *Income* is significantly positive meaning that individuals have higher trust in banks when they have higher income. Education is significantly negative in four specifications, in line with the view that higher education is associated with lower trust in banks. The estimated coefficient for *General trust* is positive and significant indicating that general trust and trust in banks are related. The variable accounting for marital status (*Married*) is not significant, meaning that marital status does not influence trust in banks.

3.2   Analysis of marginal effects

We complement the analysis of the main estimations by examining the economic significance of the results. To this end, we compute the marginal effects following the ordered logit estimations. The estimated coefficients reported in Table 2 indicate statistical significance and the sign of the effect, marginal effects inform on the magnitude of the effects as a percentage point change in probability of falling within a certain outcome category. The marginal effects concerning the main estimations in Column 1 of Table 2 are reported in the first two columns of Table 3. To provide clear results, we only report the marginal effects for positive trust in banks, i.e. answers including categories 3 and 4 for "quite a lot of confidence" and "great deal of confidence" in banks. For our dummy variables, the reported marginal effects are based on a change by one category. For other variables, it is a change of one standard deviation.

We focus on the marginal effects reported for the estimated coefficients that are significant, i.e. the dummy for systemic banking crisis, general trust, female, education and income variables.

If an individual has experienced a banking crisis, it decreases the probability of a response in category 4 by 2.9 percentage points on average, and in the case of positive confidence in banks (both category 3 and 4) by 5.2 percentage points. This effect is higher than the effect for other variables. "Trusting people in general" increases the probability of a response in category 4 by 2 percentage points. Being a woman raises the likelihood by 1.4 percentage points. Having secondary or tertiary education decreases this probability by 0.7 percentage points. For the income variable, increasing income by one standard deviation increases the probability that the respondent will give a category 4 response by 0.9 percentage point. The analysis of marginal effects overall confirms the significant role of previous banking crisis experience in influencing an individual's trust in banks.

4   Crisis characteristics

In this section, we complement our main findings with additional estimations. We first analyze whether the severity of the banking crisis affects the relation between past banking crisis experience and trust in banks. We also account for the time elapsed from the crisis and the influence of the most recent crisis. The investigation continues by considering currency and twin crises.

4.1   Severity of banking crises

So far, we have treated all banking crises similarly, assuming the same effect on trust in banks. In reality, banking crises differ in severity and have wide-ranging consequences.

Does a more severe banking crisis do greater damage to trust in banks than a less severe crisis? In other words, do severe banking crises influence individuals in a more severe way and cause greater erosion in trust in banks, or is an individual's trust in banks equally sensitive to any banking crisis regardless of the magnitude of the event?

To this end we check the conditional effect of banking crises on trust in banks, depending on the severity of the crisis. Severity of crisis can be defined in terms of real effects on the economy or its specific impact on the banking sector. Accordingly, we first define a banking crisis as severe if the output loss is higher than the median of the crises included in the dataset from Laeven and Valencia (2018) and as less severe if the output loss is lower than the median. We alternatively account for the impact specifically on the banking sector by considering peak liquidity support (in % of deposits) from the same dataset. The results are displayed in Tables 4 and 5 for each indicator of the severity of the crisis.

We observe that the experience of any banking crisis, severe or mild, has a significant and negative influence on trust in banks. This holds true for both classifications of the severity of the

crisis. Thus, even a mild banking crisis can erode trust in banks. When considering the exposure to crisis, the effect is negative and significant for both severe and less severe crises.

We obtain interesting results for age brackets when output loss is used to classify crises as severe or less severe (Table 4). Severe banking crises detrimentally affect trust in banks of people under 50 at the crisis time. The observation in the dummy variable for age groups 0-10, 11-20, 21-30, 31-40 and 41-50 in our narrow age brackets, and for the age group 21-40 in our broad age brackets, are significantly negative for those experiencing a severe banking crisis experience. In other words, severe banking crises affect trust in banks of younger people, while less severe banking crises are felt more by older people. This result does not hold if the severity of crisis is defined based on peak liquidity (Table 5). Here, the results are in line with the baseline estimations in that both severe and less severe crises have significant influence on older people. The liquidity measure used to characterize severity of crisis is related to the functioning of the banking sector and may not necessarily correlate with real effects of the crisis. As a result, it may not have the same direct consequences for all individuals.

The finding on the consequences of severe banking crises can be linked to the conclusion from Malmendier and Nagel (2011) and Giuliano and Spilimbergo (2014) that early experiences of economic crises influence the beliefs of individuals. These studies show how living through an economic depression had persistent impact on both risk preferences and redistribution preferences. Our results suggest that severe banking crises can be comparable to economic depressions (and they can of course be intertwined) in that their high magnitude at the level of a country exerts a significant influence on the beliefs of individuals who were young at the time of the crisis. Although not necessarily affected directly, the severity of the crisis may have caused indirect exposures such as observing the suffering of others.

Less severe banking crises seem to have greater impact on the trust in banks of older people at the time of the crisis. Older people are harder hit by losses during a banking crisis because they have more to lose (Mudd, Pashev and Valev, 2010; Osili and Paulson, 2014), and mild crises apparently lack sufficient magnitude to significantly impact the lives of younger people.

We make two conclusions based on the analysis that included banking crisis severity. First, both severe and less severe banking crises hamper trust in banks. The severity of the banking crisis does not need to be high to exert a detrimental impact on trust in banks. Second, how individuals of different ages are affected depends on the severity of the crisis.

4.2   Time of the crisis

Some of the crises experienced occurred as long as thirty years ago, so their influence on current trust in banks may have attenuated. To check if our main result confirming the influence of banking crisis on trust in banks holds when accounting for time elapsed from the crisis, we create a variable *Distance* that equals the number of years elapsed since the respondent experienced his or her most recent banking crisis. As reported in Table 1, the average of this variable stands at 9.6 years. The *Distance* variable is used as additional control variable in our main estimations. The results provided in Table 6 show that the estimated coefficient for *Distance* is not significant in these estimations, indicating that the time elapsed from the crisis experience is not related to the level of trust in banks. The results concerning the sign and significance of *Systemic banking crisis* and *Exposure to crisis* variables are the same as in the main estimations.

The GFC, which started in 2008, affected many countries and it is still in the mind of most people. Thus, the GFC could have its own significant influence on our results. To make sure that our findings are not driven by this recent event, we estimate the main estimations on the subsample that does not include the 2008 crisis. Even here we find negative and significant coefficients, thereby confirming the validity of our main findings on the relation between banking crises and trust in banks (Table 7).

4.3   Currency and twin crises

Our analysis so far has focused on banking crises, i.e. the type of crises we assume should have the greatest influence on trust in banks. It is possible, however, that other types of financial crises also affect trust in banks. In particular, currency crises can deteriorate trust in banks as they may be associated with losses for a large share of population. Moreover, banking and currency crises can occur at the same time as twin crises. In the following discussion, we check whether banking crises exert a distinct influence on trust in banks relative to currency and twin crises.

We use the definition of Laeven and Valencia (2018) for a currency crisis, i.e. a currency crisis is a yearly nominal depreciation of the currency vis-à-vis the US dollar of at least 30 percent that is at least 10 percentage points higher than the depreciation observed the previous year. A twin crisis occurs if the currency crisis takes place between the start and the end of the systemic banking crisis. We redo our estimations by considering currency and twin crises rather than banking crises in the specification of the crises variables. The results are reported in Table 8.

Overall both currency and twin crises deteriorate trust in banks even if the estimated coefficient is statistically more significant in the case of a twin crisis. This holds true when evaluating

economic significance based on marginal effects. More specifically, marginal effects reported in Table 3 indicate that the experience of a currency crisis decreases the probability of a response in category 4 (high trust in banks) by 1.1 percentage points, and a decrease of 2.3 percentage points in the case of a twin crisis. We observe, however, that the economic significance of the impact on trust in banks is lower for both currency and twin crises than for a banking crisis. Having experienced a banking crisis decreases the probability of a response in category 4 (high trust in banks) by 2.9 percentage points. Thus, the detrimental effect of trust in banks seems to be connected specifically to crisis in the banking sector.

Overall, we find support that both currency and twin crises hamper trust in banks, but that their detrimental impacts are weaker than that of pure banking crises.

5   Robustness checks

We perform three robustness checks to check the sensitivity of our results.

In our first check, we run a logit model as an alternative for the ordered logit model. The dependent variable in this case is the dummy variable *High trust in banks*, which equals one if the respondent has a great deal of confidence or quite a lot of confidence in banks, and zero if the respondent has little or no confidence in banks.

The results are displayed in Table 9. We observe the same findings when applying the logit model as the results for the ordered logit model. The dummy variable for systemic banking crisis is significantly negative, and the estimated coefficient for exposure to crises is significantly negative. Hence, our main conclusion concerning the estimations based on the logit model is that they corroborate the findings obtained for the ordered logit model and strengthen the robustness of our results.

For the second robustness check, we use an alternative dataset to define crisis variables. We rely on the dataset of Reinhart and Rogoff (2009) and use its banking crisis variables.[5] This dataset covers fewer countries in our sample than the dataset from Laeven and Valencia (2018) used in the main estimations (where we could perform estimations on the 52 countries covered in the last wave of the World Values Survey that had been asked about trust in banks). Only 30 such countries are included in the Reinhart and Rogoff dataset. Nevertheless, this alternative dataset allows testing

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[5] The dataset Global Crises Data is available at
https://www.hbs.edu/behavioral-finance-and-financial stability/data/Pages/global.aspx
Banking crisis is identified by two types of events: either there were bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions. Second, if there are were no runs, there was the closure, merging, takeover, or large-scale government assistance of an important financial institution that marks the start of a string of similar outcomes for other financial institutions.

the sensitivity of our main findings. It has the added advantage of covering a longer time period, starting in 1800 rather than 1970 as in the dataset from Laeven and Valencia (2018). The issue is that individuals surveyed for trust in banks between 2010 and 2014 in the World Values Survey might have experienced banking crises before 1970. Historical evidence on banking crises, however, shows that banking crises were rare before 1970, limiting the possibility to experience banking crises at this time. Nonetheless, by using the dataset from Reinhart and Rogoff (2009), we control for the banking crises before 1970.

The results for the estimations with alternative definition of the crises based on Reinhart and Rogoff (2009) are reported in Table 10. We obtain the same results as in the main estimations. We find that the estimated coefficients for the banking crisis variable and exposure to banking crises variable are both significantly negative. Hence the occurrence of a banking crisis and the exposure to banking crises in the lifetime of the individual have a detrimental impact on trust in banks as observed in the main estimations.

Our third robustness check considers the impact of stock market crises on trust in banks. In the previous discussion, we focused on banking crises. We also considered currency crises as they may cause a large share of population to incur losses and can occur simultaneously with a banking crisis (i.e. twin crisis). Stock market crises, in contrast, usually do not directly affect as large a swath of the population as banking or currency crises. However, they may generally increase distrust in the financial system and thus affect trust in banks.

Turning again to the dataset of Reinhart and Rogoff (2009), we find information on stock market crises not available in the dataset of Laeven and Valencia (2018). We consider three specifications to study the impact of stock market crises on trust in banks. We consider a dummy variable equal to one if the person has lived through at least one stock market crisis in the lifetime in order to test if experiencing at least one stock market crash in a lifetime affects trust in banks. We further control for individuals who have experienced multiple stock market crises during their lives with a dummy variable that equals one if the individual has experienced more than six stock market crashes.[6] Finally, we consider a specification including two dummy variables, one if the individual has experienced more than six stock market crashes and one if the individual has experienced between one and six stock market crashes. This lets us compare the influence on trust in banks from exposure to stock market crises over a person's lifetime.

We report the results of the estimations in Table 11. We observe that none of the variables accounting for stock market crises is significant in any specification. This supports the view that

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[6] A few respondents in the sample had lived through as many as 19 stock market crashes. The median was six stock market crashes.

trust in banks is not affected by stock market crises, confirming the special influence of banking crises on trust in banks.

6 Conclusion

This paper provides a cross-country assessment of how past experience of banking crises influences trust in banks. Our main conclusion is that an individual's experience of a banking crisis deteriorates his or her trust in banks. We find that an individual who has experienced a banking crisis has a lower degree of trust in banks, and that even a higher exposure to banking crises over the individual's lifetime is negatively related with trust in banks.

The analysis of the influence of the age at the time of a banking crisis reveals that a banking crisis experience most diminishes trust in banks if the individual is between 41 and 60 years of age at the time of the banking crisis. Older individuals likely suffer greater losses during banking crises, so their trust in banks is most affected. This result is in line with that of Mudd, Pashev and Valev (2010), who conclude that the experience of a banking crisis impacts an individual's behavior.

When we account for the severity of banking crises, we find that any experience of a banking crisis deteriorates trust in banks. However, severe banking crises affect young people at the time of the crisis, while less severe banking crises have more influence on older people. Thus, experiences of severe banking crises early in life influence trust in banks, causing a lasting detrimental influence on trust in banks. This finding accords with the result from the literature on the effects of crises on the economic beliefs and behavior that early life experiences of crises can exert a long term effect on beliefs (Malmendier and Nagel, 2011; Giuliano and Spilimbergo, 2014).

We furthermore observe that past experience of both currency crises and twin crises reduces trust in banks. However, their detrimental impact is weaker than that of pure banking crises. On the other hand, the fact that an individual has experienced stock market crashes has no effect on trust in banks. In other words, the detrimental impact on trust in banks seems to specifically concern systemic banking crises.

Our investigation shows that banking crises contribute to a lasting reduction of confidence in banks. Given the key role of trust in banks to support the effectiveness of the financial system, such crises can have a detrimental and long-lasting impact on the economy. When the costs of this long-term damage are added to the output loss and fiscal costs of banking crises, policymakers have strong motivation for preventing banking crises. As a final insight, we note that our work contributes to better understanding of the cross-country differences in trust in banks as inhabitants of countries with banking crises have lower confidence in their financial institutions.

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Tables

Table 1   Descriptive statistics

Variable	N	Mean	Std. dev.
Trust in banks	66,293	2.56	0.92
General trust	66,293	1.25	0.43
Female	66,293	0.52	0.50
Education	66,293	0.44	0.50
Income	66,293	4.93	2.07
Married	66,293	0.63	0.48
Distance	66,293	9.57	9.83
Systemic banking crisis	66,293	0.74	0.44
Exposure to crises	66,293	2.12	1.77
Two crises	66,293	0.25	0.43
Twin crisis	66,293	0.37	0.48
Currency crisis	66,293	0.63	0.48
Age brackets for systemic banking crisis			
Respondent 0–10 years during crisis	66,293	0.16	0.37
Respondent 11–20 years during crisis	66,293	0.19	0.39
Respondent 21–30 years during crisis	66,293	0.18	0.39
Respondent 31–40 years during crisis	66,293	0.16	0.36
Respondent 41–50 years during crisis	66,293	0.12	0.32
Respondent 51–60 years during crisis	66,293	0.08	0.27
Respondent 0–20 years during crisis	66,293	0.33	0.47
Respondent 21–40 years during crisis	66,293	0.32	0.47
Respondent 41–60 years during crisis	66,293	0.19	0.39
Respondent 60+ years during crisis	66,293	0.03	0.18
Age brackets for currency crisis			
Respondent 0–10 years during crisis	66,293	0.23	0.42
Respondent 11–20 years during crisis	66,293	0.23	0.42
Respondent 21–30 years during crisis	66,293	0.22	0.41
Respondent 31–40 years during crisis	66,293	0.17	0.37
Respondent 41–50 years during crisis	66,293	0.11	0.31
Respondent 51–60 years during crisis	66,293	0.07	0.25
Respondent 0–20 years during crisis	66,293	0.35	0.48
Respondent 21–40 years during crisis	66,293	0.33	0.47
Respondent 41–60 years during crisis	66,293	0.15	0.36
Respondent 60+ years during crisis	66,293	0.04	0.20

Table 2   Main estimations

	(1)	(2)	(3)	(4)	(5)
	Systemic banking crisis	Exposure to crises	Two crises	Narrow age brackets	Broad age brackets
Systemic banking crisis	−0.235*** (0.038)		−0.232*** (0.039)		
Exposure to crises		−0.055*** (0.012)			
Respondent 0–10 years during crisis				−0.024 (0.043)	
Respondent 11–20 years during crisis				−0.036 (0.051)	
Respondent 21–30 years during crisis				−0.071 (0.049)	
Respondent 31–40 years during crisis				−0.080 (0.050)	
Respondent 41–50 years during crisis				−0.117** (0.047)	
Respondent 51–60 years during crisis				−0.147*** (0.045)	
Respondent 60+ years during crisis				−0.090 (0.126)	−0.060 (0.109)
Respondent 0–20 years during crisis					−0.017 (0.047)
Respondent 21–40 years during crisis					−0.060 (0.042)
Respondent 41–60 years during crisis					−0.112** (0.034)
Two crises			−0.056 (0.076)		
General trust	0.158*** (0.032)	0.157*** (0.032)	0.158*** (0.032)	0.159*** (0.033)	0.159*** (0.033)
Female	0.113*** (0.030)	0.113*** (0.030)	0.113*** (0.030)	0.112*** (0.030)	0.112*** (0.030)
Education	−0.054 (0.033)	−0.055* (0.033)	−0.055* (0.033)	−0.061* (0.034)	−0.060* (0.034)
Income	0.077*** (0.012)	0.077*** (0.012)	0.076*** (0.012)	0.076*** (0.012)	0.076*** (0.012)
Married	−0.006 (0.027)	−0.009 (0.026)	−0.003 (0.027)	−0.002 (0.027)	−0.006 (0.026)
Country dummy variables	YES	YES	YES	YES	YES
Number of observations	66,293	66,293	66,293	66,293	66,293
Pseudo R-squared	0.055	0.055	0,055	0.055	0.055

Estimated coefficients from ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks.* Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 3   Marginal effects for ordered logit estimations

Model specification	Systemic banking crisis		Currency crisis		Twin crisis	
Trust in banks outcome	3	4	3	4	3	4
Dummy variable for the crisis	−2.3	−2.9	−0.9	−1.1	−1.8	−2.3
General trust	1.5	2	1.5	2	1.5	2
Female	1.1	1.4	1.1	1.4	1.1	1.4
Education	−0.5	−0.7	−0.5	−0.7	−0.5	−0.7
Income	0.7	0.9	0.7	1	0.7	1
Married	−0.1	−0.1	−0.1	−0.2	−0.1	−0.1

Marginal effects for the main ordered logit model estimations reported in Table 2 and Table 8 are presented here in percentage points. For dummy variables, the marginal effects are based on change of one category. For other variables, the marginal effects are based on a change of one standard deviation. The dependent variable is the ordinal variable *Trust in banks.* Marginal effects are presented for *Trust in banks* positive (3 and 4) outcome categories.

Table 4   Severity of banking crisis (output loss)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Severe crisis (output loss higher than median)				Less severe crisis (output loss lower than median)			
	Dummy for crisis	Exposure to crises	Narrow age brackets	Broad age brackets	Dummy for crisis	Exposure to crises	Narrow age brackets	Broad age brackets
Systemic banking crisis	−0.211*** (0.037)				−0.246*** (0.073)			
Exposure to crises		−0.059*** (0.014)				−0.037*** (0.014)		
Respondent 0–10 years during crisis			−0.088** (0.044)				−0,047 (0.069)	
Respondent 11–20 years during crisis			−0.128*** (0.048)				−0,028 (0.099)	
Respondent 21–30 years during crisis			−0.119** (0.059)				−0,051 (0.083)	
Respondent 31–40 years during crisis			−0.118* (0.065)				−0,008 (0.096)	
Respondent 41–50 years during crisis			−0.166*** (0.069)				−0,038 (0.075)	
Respondent 51–60 years during crisis			−0,088 (0.071)				−0.133** (0.070)	
Respondent 60+ years during crisis			0,003 (0.190)	0,032 (0.169)			0,063 (0.155)	0,044 (0.153)
Respondent 0–20 years during crisis				−0,080 (0.053)				−0,086 (0.069)
Respondent 21–40 years during crisis				−0,090* (0.052)				−0,057 (0.074)
Respondent 41–60 years during crisis				−0.103* (0.054)				−0.114** (0.053)
General trust	0.151*** (0.043)	0.150*** (0.043)	0.154*** (0.043)	0.153*** (0.043)	0.236*** (0.080)	0.234*** (0.081)	0.235*** (0.081)	0.233*** (0.080)
Female	0.114*** (0.051)	0.113** (0.051)	0.113** (0.052)	0.112** (0.052)	0.208*** (0.070)	0.209*** (0.070)	0.210*** (0.070)	0.209*** (0.070)
Education	−0.094* (0.051)	−0.0968* (0.050)	−0.0988* (0.051)	−0.0960* (0.051)	−0,107 (0.076)	−0,106 (0.077)	−0,104 (0.079)	−0,103 (0.079)
Income	0.062*** (0.016)	0.0610*** (0.016)	0.0606*** (0.016)	0.0609*** (0.016)	0.0919*** (0.024)	0.0926*** (0.024)	0.0927*** (0.024)	0.0927*** (0.024)
Married	0.0057 (0.035)	0.0040 (0.033)	0.016 (0.032)	0.0037 (0.032)	−0.0602 (0.049)	−0.0696 (0.048)	−0.0713 (0.056)	−0.0656 (0.053)
Country dummy variables	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	20728	20728	20728	20728	17752	17752	17752	17752
Pseudo R-squared	0.047	0.047	0.047	0.047	0.080	0.080	0.080	0.080

Ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 5   Severity of banking crisis (peak liquidity support as % of deposits)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Severe crisis (liquidity provided at peak higher than median)				Less severe crisis (liquidity provided at peak lower than median)			
	Dummy for crisis	Exposure to crises	Narrow age brackets	Broad age brackets	Dummy for crisis	Exposure to crises	Narrow age brackets	Broad age brackets
Dummy for systemic banking crisis	−0.238*** (0.055)				−0.222*** (0.049)			
Exposure to crises		−0.055*** (0.013)				−0.053** (0.025)		
Respondent 0–10 years during crisis			−0.0513 (0.053)				−0.012 (0.071)	
Respondent 11–20 years during crisis			−0.0632 (0.065)				−0.00051 (0.086)	
Respondent 21–30 years during crisis			−0.0958 (0.063)				−0.0558 (0.08)	
Respondent 31–40 years during crisis			−0.034 (0.052)				−0.140* (0.083)	
Respondent 41–50 years during crisis			−0.112 (0.069)				−0.144* (0.078)	
Respondent 51–60 years during crisis			−0.129** (0.066)				−0.146** (0.059)	
Respondent 60+ years during crisis			−0.383*** (0.129)	−0.353*** (0.116)			−0.012 (0.156)	0.0362 (0.127)
Respondent 0–20 years during crisis				−0.0537 (0.063)				0.0232 (0.073)
Respondent 21–40 years during crisis				−0.0625				−0.0638 (0.065)
Respondent 41–60 years during crisis				−0.0874* (0.048)				−0.131*** (0.047)
General trust	0.159*** (0.056)	0.158*** (0.056)	0.159*** (0.056)	0.158*** (0.056)	0.204*** (0.047)	0.203*** (0.047)	0.207*** (0.047)	0.206*** (0.047)
Female	0.129*** (0.033)	0.128*** (0.033)	0.129*** (0.033)	0.128*** (0.034)	0.191*** (0.056)	0.190*** (0.056)	0.189*** (0.057)	0.189*** (0.057)
Education	−0.0698* (0.042)	−0.0716* (0.042)	−0.0809* (0.043)	−0.0780* (0.042)	−0.0998 (0.061)	−0.0997* (0.06)	−0.104* (0.062)	−0.103* (0.062)
Income	0.106*** (0.019)	0.106*** (0.02)	0.105*** (0.019)	0.105*** (0.019)	0.0684*** (0.015)	0.0688*** (0.015)	0.0688*** (0.015)	0.0687*** (0.015)
Married	0.0262 (0.045)	0.0261 (0.046)	0.019 (0.044)	0.0166 (0.045)	−0.0285 (0.043)	−0.0364 (0.042)	−0.0174 (0.043)	−0.0224 (0.042)
Country dummy variables	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	26880	26880	26880	26880	25080	25080	25080	25080
Pseudo R-squared	0.040	0.040	0.040	0.040	0.072	0.073	0.072	0.073

Ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 6   Time of crisis

	(1)	(2)
	Systemic banking crisis	Exposure to crises
Systemic banking crisis	−0.341*** (0.098)	
Exposure to crises		−0.041** (0.024)
Distance	0.004 (0.003)	−0.002 (0.003)
General trust	0.158*** (0.032)	0.158*** (0.032)
Female	0.113*** (0.030)	0.113*** (0.030)
Education	−0.055* (0.033)	−0,054 (0.033)
Income	0.076*** (0.012)	0.077*** (0.012)
Married	−0,003 (0.027)	−0,009 (0.026)
Country dummy variables	YES	YES
Number of observations	66,293	66,293
Pseudo R-squared	0.055	0.055

Estimated coefficients taken from ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 7   Excluding the Global Financial Crisis (crises before 2008 only)

	(1)	(2)
	Systemic banking crisis	Exposure to crises
Dummy for systemic banking crisis	−0.235*** (0.038)	
Exposure to crises		−0.055*** (0.011)
General trust	0.142*** (0.038)	0.141*** (0.038)
Female	0.077** (0.031)	0.077** (0.031)
Education	−0.042 (0.036)	−0.043 (0.036)
Income	0.071*** (0.012)	0.071*** (0.013)
Married	0.007 (0.029)	0.003 (0.029)
Country dummy variables	YES	YES
Number of observations	52030	52030
Pseudo R-squared	0.043	0.043

Estimated coefficients from ordered logit estimations, the dependent variable being the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 8   Currency and twin crisis

	(1)	(2)
	Currency crisis	Twin crisis
Systemic banking crisis	−0.090* (0.037)	−0.186*** (0.056)
General trust	0.158*** (0.032)	0.158*** (0.032)
Female	0.112** (0.030)	0.113** (0.030)
Education	−0,054 (0.033)	−0,054 (0.033)
Income	0.077*** (0.012)	0.077*** (0.012)
Married	−0.013 (0.027)	−0.012 (0.027)
Country dummy variables	YES	YES
Number of observations	66293	66293
Pseudo R-squared	0,055	0,055

Estimated coefficients taken from ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 9   Logit model estimations

	(1)	(2)
	Systemic banking crisis	Exposure to crises
Systemic banking crisis	−0.206*** (0.045)	
Exposure to crises		−0.046*** (0.013)
General Trust	0.156*** (0.036)	0.155*** (0.036)
Female	0.120*** (0.031)	0.119*** (0.031)
Education	−0.019 (0.036)	−0.02 (0.036)
Income	0.077*** (0.012)	0.077*** (0.012)
Married	−0.010 (0.031)	−0.013 (0.031)
Constant	0.439*** (0.078)	0.467*** (0.093)
Country dummy variables	YES	YES
Number of observations	66293	66293
Pseudo R-squared	0,090	0,090

Estimated coefficients taken from logit estimations. The dependent variable is the ordinal variable *High trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 10   Alternative crisis variables (Reinhart and Rogoff, 2009)

	(1)	(2)
	Banking crisis	Exposure to crises
Systemic banking crisis	−0.239*** (0.058)	
Exposure to crises		−0.055*** (0.015)
General trust	0.200*** (0.040)	0.201*** (0.040)
Female	0.128*** (0.038)	0.127*** (0.041)
Education	−0.086** (0.040)	−0.082** (0.041)
Income	0.079*** (0.015)	0.079*** (0.015)
Married	−0.027 (0.030)	−0.028 (0.029)
Country dummy variables	YES	YES
Number of observations	40,635	40,635
Pseudo R-squared	0.068	0.068

Estimated coefficients taken from ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 11   Stock market crises

	(1)	(2)	(3)
Stock market crisis	0.059	0.062	
	(0.085)	(0.092)	
Dummy if up to 6 crashes (1–6)			0.062
			(0.092)
Dummy if over 6 crashes (7–19)		–0.054	0.008
		(0.051)	(0.095)
General trust	0.202***	0.202***	0.202***
	(0.039)	(0.039)	(0.039)
Female	0.136***	0.135***	0.135***
	(0.038)	(0.038)	(0.038)
Education	–0.086**	–0.089**	–0.089**
	(0.040)	(0.040)	(0.040)
Income	0.079***	0.078***	0.078***
	(0.015)	(0.015)	(0.015)
Married	–0.044	–0.036	–0.036
	(0.029)	(0.029)	(0.029)
Country dummy variables	YES	YES	YES
Pseudo R-squared	0.068	0.068	0.068
Observations	41,812	41,812	41,812

Estimated coefficients taken from ordered logit estimations. The dependent variable is the ordinal variable *Trust in banks*. Standard errors in parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Appendix

Table A1   Definitions of variables

Variable name	Definition
Trust in banks	Discrete variable, value between 1 and 4. Question: *"How much confidence you have in banks?"* Available answers: (1) none at all (2) not very much (3) quite a lot, and (4) great deal of confidence.
High trust in banks	Dummy variable. Question: *"How much confidence you have in banks?"* Available responses: (1) none at all (2) not very much (3) quite a lot, and (4) great deal of confidence. Equals 1 for answers (3) and (4), and 0 otherwise.
General trust	Dummy variable equal to one if respondent answers: *Most people can be trusted* to the question: "*Generally speaking. would you say that most people can be trusted or that you need to be very careful in dealing with people?"* 0 otherwise.
Female	Dummy variable. Equals 1 for females.
Education	Dummy variable. Equals 1 for full secondary or tertiary education and 0 for other respondents.
Income	Respondent's self-reported level of income in a scale of 1 to 10, with 1 the lowest income decile and 10 the highest.
Married	Marital status dummy variable. Equals 1 if respondent is married, 0 otherwise.
Systemic banking crisis	Equals 1 if there has been at least one systemic banking crisis during the respondent's lifetime, 0 otherwise.
Currency crisis	Equals 1 if there has been at least one currency crisis during the respondent's lifetime, 0 otherwise.
Twin crisis	Equals 1 if individual simultaneously experienced a systemic banking crisis and currency crisis, 0 otherwise.
Two crises	Equals 1 if there have been at least two systemic banking crises during the respondent's lifetime, 0 otherwise.
Distance	Time elapsed in years from the most recent crisis the respondent has experienced.
Respondent X–Y years during crisis	Age bracket dummy. Equals 1 if there was a systemic banking (or currency) crisis in the country when the respondent belonged to this specific age group.
Output loss	In % of GDP. Computed as the cumulative sum of differences between actual and trend real GDP over the period [T,T+3], with T denoting the starting year of the crisis.
Peak Liquidity	In % of deposits. Measured as the ratio of central bank claims on deposit money banks and liquidity support from the treasury to total deposits and liabilities to non-residents.

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