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Has the COVID-19 pandemic affected public trust? Evidence for the US and the Netherlands

Carin van der Cruijsen\textsuperscript{a,}\textsuperscript{,} Jakob de Haan\textsuperscript{b,c}, Nicole Jonker\textsuperscript{a}

\textsuperscript{a}De Nederlandsche Bank, PO Box 98, 1000 AB Amsterdam, the Netherlands
\textsuperscript{b}University of Groningen, Faculty of Economics and Business, PO Box 900, 9700 AV Groningen, the Netherlands
\textsuperscript{c}CESifo, Munich, Germany

\begin{abstract}
Using two large-scale surveys among households, we examine the drivers of public trust in banks, insurance companies, BigTechs, and other people in the United States and the Netherlands, and analyse whether the COVID-19 pandemic has affected public trust. Our results suggest that the COVID-19 pandemic did not have much effect on trust in financial institutions in the US and the Netherlands. However, trust in BigTechs and trust in other people declined in both countries, especially in the US. Our regression results show that the relationship between respondents’ characteristics and (changes in) trust differs across the US and the Netherlands. However, for both countries we find evidence that individuals with poor health have lower levels of trust than healthy people, and that trust among poor-health respondents dropped more during the pandemic. Furthermore, trust in other people is positively related to trust in banks, insurance companies, and BigTechs.

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\end{abstract}

1. Introduction

Using two large-scale surveys among households, we examine the drivers of public trust in banks, insurance companies, BigTechs (which also offer financial services) and other people and analyse whether the COVID-19 pandemic has affected public trust in the United States and the Netherlands.

Trust in banks has received a lot of attention. After the global financial crisis, public trust in banks dropped in most countries (Guiso, 2010). Since then, trust in banks has recovered somewhat, but it is not clear whether the COVID-19 pandemic has affected this upward trend. In contrast to the global financial crisis, banks were generally regarded as part of...
the solution to the COVID-19 crisis by providing credit to firms and moratoria on loan repayments. Therefore, the COVID-19 pandemic may have spurred trust in banks.

Unlike trust in banks, trust in insurance companies has received hardly any attention. In general, trust in banks and insurance companies is important because of financial stability concerns and the viability of financial institutions’ business models. Low trust in the financial sector may undermine financial stability (Guiso, 2010). In the worst case, it may even lead to bank runs. Low trust may also damage the financial services industry. If the industry is not trusted, consumers will choose to engage less, which, in turn, will damage both the industry and the economy by reducing the availability of capital for productive purposes (Jaffer et al., 2014). In addition, consumers may switch to non-financial suppliers of financial services such as BigTechs, although that will also depend on public trust in these BigTechs, as well as BigTechs’ interest in providing these financial services (DNB, 2021).

Trust in BigTechs has also received limited attention in the literature so far, while in an increasingly digitalised economy built on big data (often personal data), it becomes important to understand what drives trust in different counterparts and people’s willingness to share data.1 We therefore also analyse public trust in BigTechs. BigTechs are “...large existing companies whose primary activity is in the provision of digital services, rather than mainly in financial services.” (Frost et al., 2019).2 Still, BigTechs are increasingly involved in payments and lending, often in partnership with financial institutions, leveraging the vast quantities of personal data they have collected in other business lines (Armantier et al., 2021). BigTechs received rather negative media coverage just before and during the pandemic mainly due to data privacy scandals. As a result, trust in BigTechs may have dropped.

Finally, we examine trust in other people (generalised trust), which has been found to be related to a wide array of micro- and macro-economic variables, such as the use of peer platform markets (van der Cruissen et al., 2019) and the size of the shadow economy (D’Heroncourt and Méon, 2012).3 Generalised trust is also highly relevant for the financial sector. For Italy, Guiso et al. (2004) find that households in areas with a high level of generalised trust are more likely to use checks for making payments and to invest a higher share of their financial wealth in stocks and less in cash. That a low level of generalised trust can explain low stock market participation is also shown in the seminal paper of Guiso et al. (2008). Generalised trust has been found to be positively related to trust in banks (Afandi and Habibov, 2017; Fungácová et al., 2019; Buriak et al., 2019; van Esterik-Plasmeijer and van Raaij, 2017; van der Cruissen et al., 2021)4, trust in insurance companies (Tranter and Booth, 2019; van der Cruissen et al., 2021) and trust in pension funds (van der Cruissen et al., 2021). It is therefore important to identify the drivers of generalised trust, to examine whether generalised trust changed during the COVID-19 pandemic, and whether its impact on trust in financial institutions and BigTechs changed. As individuals confront one another more when resources seem to be scarce, they may trust each other less under those circumstances. In addition, given that trust involves the risk of possible betrayal by others, it seems likely that those people most threatened by a disaster or crisis (like the COVID-19 crisis) will have lower levels of generalised trust.5 There is some support for this. For instance, using Australian household survey data, Jetter and Kristoffersen (2018) show that individuals’ interpersonal trust drops sharply after a severe financial shock such as bankruptcy.

Our analysis focuses on two Western countries that are similar in some respects, and quite different in others. Although financial institutions play a major role in the economies of both countries, households and firms in the Netherlands rely much more on bank credit than US households and firms. The development that BigTechs are increasingly involved in financial services is more prominent in the US than in the Netherlands (DNB, 2021). The drivers of public trust in financial institutions and BigTechs may thus differ between the two countries. As both countries pursued different policies to cope with the COVID-19 pandemic, the extent to which public trust has changed during the pandemic may also differ between

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1 In a recent study, Armantier et al. (2021) examine the impact of the COVID-19 pandemic on US consumers’ willingness to share data. They report that there was only a modest increase in the share of respondents who became less willing to share data with traditional financial institutions during the pandemic. However, willingness to share data with BigTechs—the least-trusted counterparty in general—dropped considerably. Bijlsma et al. (2022a) show that possible abuse of customer data and concerns that BigTechs do not act in customers’ best interests are two important reasons mentioned by consumers for their mistrust of BigTechs.

2 For more information on BigTechs in finance and the resulting benefits and risks to financial stability we refer to Financial Stability Board (FSB) (2019).

3 Most cross-country studies on generalised trust measure it as the share of a population answering that most people can be trusted in response 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?’ (see, for instance, Aghion et al., 2010).

4 In contrast, Ampudia and Palligkinis (2018) find a correlation of practically 0 between Italians’ trust in other people and their trust in banks.

5 Alternatively, the pandemic may constitute a common foe against which people can unite (Searing, 2013).

6 Likewise, using water height–based flood severity data on the 1998 flood in Bangladesh with individual-level longitudinal World Values Survey data, Rahman et al. (2020) report that individuals who experienced floods have lower levels of generalised trust. Furthermore, Friese and Marcus (2021) find a negative impact of involuntary job loss on people’s generalised trust using quinquennial trust measurements from 2003 through 2018 in the German Socio-Economic Panel. Additionally, using survey data for the Netherlands, van der Cruissen et al. (2016) show that adverse personal experiences related to the financial crisis contribute to reducing generalised trust.
the US and the Netherlands.\footnote{In March 2021, when the surveys were taken, there were 7,500 confirmed COVID-19 infections and 97 deceased per 100,000 inhabitants in the Netherlands and 9,200 confirmed COVID-19 infections and 167 deceased per 100,000 US residents. See https://covid19.who.int (accessed on 18 August 2021). In March 2021, the government response stringency index was 78.7 in the Netherlands (maximum 82.4 in January 2021) and 68.1 in the US (maximum 75.5 in November 2020). One of the differences in containment measures was the introduction of a curfew in the Netherlands. Another difference is that in the Netherlands the containment measures applied to the whole country, whereas in the US containment measures varied by state (Rothert et al., 2020). The governments of both countries introduced generous measures to support citizens and businesses that were hit by the pandemic in order to contain the economic impact. To illustrate, the value of the US Coronavirus Aid, Relief and Economic Security Act (‘Cares’ act) was estimated at around 11% of US GDP in 2020, and the total value of measures taken in the Netherlands at around 16% of Dutch GDP in 2020 (IMF, 2021). The central banks also took several supporting measures (IMF, 2021).} Finally, whereas the Netherlands is a high-trust country, generalised trust in the US is relatively low.\footnote{See the results of Q57 of World Values Survey Wave 7: 2017–2022 on https://www.worldvaluessurvey.org/WVSOnline.jsp. URL last time accessed on 4 July 2022. The share of respondents saying that people can be trusted is 37.0% in the US and 55.4% in the Netherlands.}

Our work adds to several strands of literature. First, we contribute to research on the drivers of trust in financial institutions as surveyed by van der Cruisen et al. (2022). A good example of this line of research is the study by Fungácová et al. (2019). Using World Values Survey data covering 52 countries during the period 2010–2014, Fungácová et al. (2019) find that women tend to trust banks more than men; trust in banks tends to increase with income, but decreases with age and education. We add to this literature by examining which demographic factors affect public trust in financial institutions and BigTechs in the US and the Netherlands.

Second, we add to the literature on generalised trust by identifying the drivers of generalised trust in the US and the Netherlands, by examining whether generalised trust in these countries—having very different levels of generalised trust—has been negatively affected by the COVID-19 pandemic and by researching whether the impact of generalised trust on trust in financial institutions and BigTechs changed during the pandemic.

Third, by researching whether public trust in financial institutions, BigTechs, and other people in the US and the Netherlands has been affected by the COVID-19 pandemic, our work contributes to research on the effects of the COVID-19 pandemic. Not surprisingly, research on the economic crisis due to the pandemic is blossoming.\footnote{See: https://cepr.org/content/covid-economics-vetted-and-real-time-papers-0. URL last accessed on 18 August 2021.} There are several channels through which a crisis can affect trust in financial institutions (van der Cruisen et al., 2022). First, the worsening economic conditions and measures taken during a crisis, can impact generalised trust which may feed through in trust in financial institutions. Similarly, personal crisis experiences may affect trust in financial institutions. In addition, the behaviour and characteristics of financial institutions may change during a crisis and thereby impact trust in financial institutions.

Apart from Armanitier et al. (2021), some other recent papers examine how the pandemic has affected public trust. Oude Groeniger et al. (2021) analyse the impact of the government measures taken during the COVID-19 pandemic on public trust in the government in the Netherlands, while Bijlsma et al. (2022b) examine the impact of the COVID-19 pandemic on trust in banks’ payment services in the Netherlands. Kye and Hwang (2020) study trust in a broad range of institutions in South Korea. The authors conclude that increased trust in an institution is associated with proactive responses to the COVID-19 crisis, while a decrease in trust is related to a lack of appropriate action taken.

Finally, by examining the relationship between respondents’ health and their level of trust during the COVID-19 pandemic our work adds to the literature on health and trust. Generalised trust has been shown to have a positive influence on longevity and self-reported health (see, for instance, the discussion of the extensive literature in Miething et al., 2020). Adding to this research, Miething et al. (2020) report that generalised trust is robustly negatively associated with all-cause mortality in the US. We examine whether respondents’ health is related to (changes in) their trust in financial institutions, BigTechs, and other people during the COVID-19 pandemic. We are thus interested in how respondents’ individual health is related to (changes in) trust, whereas most of the literature on health and trust focusses on the impact of trust on health. Still, we are not the first to examine the impact of individual health on trust. For instance, Oude Groeniger et al. (2021) report that the impact of government measures during the COVID-19 pandemic on public trust in the government in the Netherlands was greater among participants with poor self-assessed health.

Our results suggest that the COVID-19 pandemic did not have much effect on trust in financial institutions in the US and the Netherlands. However, trust in BigTechs and other people declined in both countries, especially in the US. Our regression results show that the impact of respondents’ characteristics on their trust in financial institutions, BigTechs and other people differs across the US and the Netherlands. For instance, for the US, trust in other people, insurers and BigTechs is lower for males than females, where the strongest gender effect is visible for trust in BigTechs. For the Netherlands, the gender effect is only present for generalised trust and trust in BigTechs. However, for both countries we find evidence that individuals with poor health have lower levels of trust. Furthermore, their trust was more affected by the COVID-19 pandemic than that of healthy people. Finally, we find that trust in other people is positively related to trust in banks, insurance companies, and BigTechs.

The remainder of the paper is organised as follows. Section 2 describes our data. Section 3 outlines the estimated models and the variables used in the data analysis. Section 4 offers the results and the final section presents our conclusions.
2. Data

2.1. RAND American life panel

Data on Americans’ trust in banks, insurance companies, BigTechs and other people is obtained by using the RAND American Life Panel (ALP). This is a nationally representative internet panel of around 6,000 consumers aged 18 and above. It is a longitudinal panel which has existed since 2003. ALP members have been recruited from several sources using multiple modes (mail, in-person/face-to-face, and telephone) and probability-based sampling methods, including telephone (random-digit dial) samples and address-based samples. To ensure the ALP is representative of all adults, people without internet access can also become an ALP member. Technological means (Chromebooks and hotspots) are provided. The ALP has been used intensively by both researchers and policymakers to study a wide range of topics. We added questions on trust to wave 8 of the ALP OMNIBUS 2000 survey. Data was collected from 8 - 19 March 2021.

We included two questions to capture the level of and change in public trust in these turbulent times. The first question measures the level of trust in: (1) most other people, (2) banks, (3) insurance companies, and (4) BigTechs such as Amazon, Apple, Facebook, Google and Microsoft. The question was answered by 2,076 respondents. The question reads as follows: “Attitudes towards other people and private institutions can range from a low level of trust to a high level of trust. How would you assess your level of trust regarding the following groups in society?” There are four answer options: “absolutely no trust”, “not so much trust”, “pretty much trust” and “a lot of trust”. The goal of the second question is to measure the change in trust due to the pandemic. It is formulated as follows: “Has the COVID-19 pandemic affected your level of trust? Using a scale from 0 to 10, where 0 indicates “trust has decreased very strongly” and 10 “trust increased very strongly”, please indicate how your level of trust has changed during the pandemic.”. This question also covers trust in most other people, banks, insurance companies and BigTechs. We use the answers of the 2,075 respondents who also completely filled in the first question.

There are differences in the personal characteristics of our sample and the general US population. There is under-sampling of men and young cohorts in the US sample. People in the lowest and highest income category are also under-sampled, whereas people with a Bachelor’s degree or higher, and white people are over-sampled. The descriptive results presented in Sections 2.3 and 2.4 are therefore weighted, using the weights provided by RAND.

2.2. DNB Trust Survey and DNB Household Survey

We use the 2021 De Nederlandsche Bank (DNB) Trust Survey (DTS) to collect data on public trust of Dutch households. Each year, DNB (the central bank of the Netherlands) collects data on trust in the financial sector. The DTS has proven to be a useful tool to answer trust-related research and policy questions (see e.g. Jansen et al., 2015; van der Cruissen et al., 2016; and van der Cruissen et al., 2021). All family members aged 16 and above of the households in the Centerpanel are invited to complete the DTS. The internet-based Centerpanel is a representative sample of the Dutch-speaking population in the Netherlands. The Centerpanel is managed by Centerdata, a research institute affiliated to Tilburg University. To recruit panel members, a random national sample was drawn from the private postal address file issue. Households were then contacted by phone number (if available) or postal mail. People who do not possess a computer with internet access also participate. Centerdata provides a simple computer, an ADSL connection and technical assistance to these people. Households can only join the Centerpanel upon invitation from Centerdata. Although the focus of the DTS is on trust in financial institutions, it also touches upon other notions of trust, such as trust in other people and trust in BigTechs. Many questions have been part of the DTS since its inception fifteen years ago and have remained unchanged, but part of the questionnaire changes from year to year. In the 2021 DTS, we have included the same question about the change in trust due to the COVID-19 pandemic as we included in the ALP. The 2021 DTS was held from 15 - 30 March 2021. 3,200 household members were selected, of whom 79% filled in the questionnaire completely, 1% answered part of the survey, and 20% did not respond at all.

The sample is not fully representative for the Dutch population. The share of men is a bit higher in our sample than in the Dutch population aged 16 and above. Older people and people with a high level of education are over-sampled, whereas people with a net annual household income of 50,000 euro or more are under-sampled. The results in the descriptive part of this study (Sections 2.3 and 2.4) are based on Centerpanel data that is weighted to correct for differences between the sample and the population with respect to gender, age, net household income, and the level of education.

An important advantage of our data is that it can easily be linked to data on personal characteristics and perceived health. This information is captured by the annual DNB Household Survey (DHS) among the same consumer panel. Only

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10 See Pollard and Baird (2017) for more information on the ALP member recruitment.
11 A list with papers using the ALP data is on https://www.rand.org/research/data/alp/papers.html. URL last accessed on 18 August 2021.
12 For more information on the ALP weights see the technical description of Pollard and Baird (2017). The differences between the weighted and un-weighted US levels of trust are small. To be precise, when we weight observations, we find that the estimated level of trust is 0.1 lower. This holds for all four trust measures: trust in most other people, banks, insurance companies, and BigTechs. Given that trust is measured on a scale from 1 “absolutely no trust” to 4 “a lot of trust” this is a small difference.
13 See Teppa and Vis (2012) for more information on the Centerpanel.
for some of the 2021 DTS respondents we do not have all the DHS information needed to estimate the regressions.  Many researchers and policymakers have used this rich survey that was launched in 1993 and covers a wide range of topics.

2.3. Trust in other people, banks, insurers and BigTechs

The ranking of generalised trust, trust in banks, trust in insurers, and trust in BigTechs differs between the US and the Netherlands (see Fig. 1). In the US, trust in banks ranks first with an average of 2.7 on a scale from 1 “absolutely no trust” to 4 “a lot of trust”; 63% of people have a fair amount or a lot of trust in banks. This figure is 44% for trust in other people (in second position) and 40% for insurers (in third position). Trust in BigTechs is the lowest. Only 1 out of 4 Americans trusts BigTechs.

In the Netherlands, generalised trust ranks first with an average of 2.8; 3 out of 4 people have a fair amount or a lot of trust in other people. Generalised trust in the Netherlands is higher than in the US (p-value=0.00). As in the US, BigTechs are the least trusted in the Netherlands with an average score of 2. In fact, the means for public trust in BigTechs do not differ significantly between the two countries (p-value=0.49). Dutch consumers have more trust in banks and insurers than in BigTechs. Dutch people trust banks somewhat more than insurance companies (2.5 versus 2.4, p-value=0.00). 56% of Dutch consumers have a fair amount or a lot of trust in banks and 45% have a fair amount or a lot of trust in insurance companies. Trust in banks is higher in the US than in the Netherlands (p-value=0.00), whereas the opposite holds for trust in insurers (p-value=0.05).

2.4. The impact of the COVID-19 pandemic on public trust

The COVID-19 pandemic reduced trust in BigTechs (see Fig. 2). Some 33% of Americans and 19% of Dutch people express a decline of trust in BigTechs. The share of people with higher trust is much smaller (11% in the US and 4% in the Netherlands). Overall, the average answer to the question of whether the COVID-19 pandemic has affected trust in BigTechs is 4.0 for the US and 4.4 for the Netherlands, which are both substantially lower than the neutral score of 5 (“Trust has not changed”). Furthermore, these results indicate that trust in BigTechs is affected most severely in the US.

In contrast, the pandemic has barely affected public trust in financial institutions. In both countries the average answer to the question of whether the COVID-19 pandemic has affected respondents’ trust is 4.8 for banks and 4.7 for insurance companies, in other words very close to the neutral score of 5.

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14 Trust in other people and private institutions are measured for 2,563 DTS respondents. For 2,534 DTS respondents we have all the DHS background information necessary to estimate the baseline regressions (Table 2, columns (1)-(4)). For 2,229 DTS respondents we also have DHS information on self-assessed health (Table 2, columns (5)-(8)).

15 See Appendix A for the questions on trust. Note that the average scores of the four different types of trust differ significantly for both the US and NL (p-value of 0.05 or less); Tables B.1 and B.2 in Appendix B provide the results for all t-tests.
Fig. 2. Impact of the COVID-19 pandemic on public trust in other people and private institutions. 
Note: 2,075 weighted observations for the US and 2,558 weighted observations for the Netherlands. 
Source: RAND ALP (2021) and DTS (2021).

The COVID-19 pandemic affected generalised trust very differently in both countries, although its impact was negative on average in both countries. Some 33% of Americans experienced a decline of trust in other people, whereas 14% experienced an increase. These figures are 19% and 9% for the Netherlands.

3. Regression models and variables

3.1. Models

To gain insights in the drivers of public trust and the potential differences between the US and the Netherlands, we estimate two sets of models. First, we run regressions with trust in other people, trust in banks, trust in insurers, and trust in BigTechs as dependent variable and respondents’ characteristics as explanatory variables. These variables are explained below. As the trust variables are ordered variables that can take on a limited number of values, we estimate ordered logistic regressions. The model is as follows:

\[ \text{Trust}_{ij} = f(X_i) + e_{ij} \]  \hspace{1cm} (1)

**trust**\(_{ij}\) denotes trust type \( j \) (i.e., trust in the institutions considered or generalised trust) while \( i \) indicates the individual. The vector \( X_i \) captures personal characteristics and \( e_{ij} \) is the idiosyncratic error. In the models for trust in financial institutions and BigTechs trust in other people is also included in the set of personal characteristics \( X_i \).

Second, to test whether respondents’ individual health relates to trust, we estimate Eq. (2). This equation is the same as Eq. (1) but with health: fair-poor, as additional explanatory variable (which is explained in Section 3.4):

\[ \text{Trust}_{ij} = f(X_i, \text{health: fair-poor}) + e_{ij} \]  \hspace{1cm} (2)

To understand how the change in trust due to the COVID-19 pandemic relates to personal characteristics and health, we run linear regressions. This approach is justified given that the ordered dependent variables can take on many values (although we also use ordered probit as a robustness check). Again, we first run a set of regressions without the health variable Eq. (3)) and then a set of regressions with this variable included (Eq. (4)). In Eqs. (3) and (4) \( \alpha_j \) is a constant and \( \beta_j \) is a vector of estimated parameters on the personal characteristics. These depend on the trust type \( j \). In Eq. (4), \( \gamma_j \) is the estimated parameter on health: fair-poor. This parameter also depends on the trust type \( j \).

\[ \text{Change in trust}_{ij} = \alpha_j + \beta_j X_i + e_{ij} \]  \hspace{1cm} (3)

\[ \text{Change in trust}_{ij} = \alpha_j + \beta_j X_i + \gamma_j \text{health: fair-poor} + e_{ij} \]  \hspace{1cm} (4)

3.2. Trust variables

We construct four dependent variables that capture the level of trust: trust in other people, trust in banks, trust in insurers, and trust in BigTechs. These ordered variables can take four values: 1 “absolutely no trust”, 2 “not so much trust”, 3 “pretty much trust” or 4 “a lot of trust”. 


Four other ordered variables capture the change in trust due to the COVID-19 pandemic. These are: change in trust in other people, change in trust in banks, change in trust in insurers, and change in trust in BigTechs. They range from 0 “decreased very strongly” to 10 “increased very strongly.” Table C.1 in Appendix C offers a detailed description of the dependent variables and their summary statistics.

3.3. Personal characteristics

We include a broad range of variables that capture personal characteristics. Male is a dummy that is 1 for males and 0 for females. Four age dummies capture the age of the respondent: between 36 and 50, between 51 and 65, and 66 and over. Respondents of 35 years and below are in the reference category. In case of the US, education: high is 1 for respondents with college education (which includes vocational training in addition to university degrees) and 0 for lower-educated respondents. In the analyses with Dutch data, education: high is 1 for respondents who successfully completed higher vocational or university education and 0 for other respondents. We construct income dummies that capture household income. For the US, household income refers to the total combined household income during the past 12 months. The following three dummies are included: income: USD 40,000-59,999, income: USD 60,000-99,999, income: ≥ USD 100,000. These variables are 1 for respondents who earn an income that falls in the income category mentioned and 0 for other respondents. The reference category is income: ≤ USD 39,999.16 For the Netherlands, we use information on household net monthly income to construct: income: EUR 1,800-2,800, income: EUR 2,800-3,900, income: ≥ EUR 3,900, and the reference category income: ≤ EUR 1,800. In our analyses we also include a variable capturing employment: the dummy employed is 1 for respondents who have a job and equals 0 for those without a job. As a proxy for wealth we include homeowner, which is 1 for homeowners and 0 for other respondents. In the Dutch data set, the variable partner is 1 if the head of a household lives together with a partner (married or unmarried) and otherwise it is 0. In the US data set, the partner variable reflects whether the resident lives together with a partner (married or unmarried). Urban area is 1 in case the respondent lives in an urban area and 0 for other respondents.

3.4. Health variable

Finally, we construct a variable that captures self-assessed health. Health: fair–poor is a dummy that is 1 for people with fair, not so good or poor health and 0 for people with good, very good or excellent health. The underlying question for the US is: “In general, would you say your health is excellent, very good, good, fair, or poor?” 15% of US respondents have fair or poor health. The DHS question is similar: “How is your health in general?” The answer categories are “excellent”, “good”, “fair”, “not so good” and “poor”. 26% of Dutch respondents assess their health to be fair, not so good or poor.17 Table C.2 in Appendix C presents a detailed description of all explanatory variables, including summary statistics.

4. Results

4.1. Public trust in other people, banks, insurers, and BigTechs

Our estimates for public trust in the US suggest that all notions of trust are related to various respondent characteristics (see Table 1). We first discuss the results of the regressions without the health variable. Although, on average, both males and females have more trust in banks, followed by trust in other people, insurance companies, and BigTechs, males have less trust in other people, insurers, and BigTechs than females. Interestingly, the gender difference for generalised trust is not consistent with the findings of studies relying on experiments (see van den Akker et al., 2020). The gender effect is strongest for trust in BigTechs. For example, males are 8 percentage points less likely to have a fair amount or a lot of trust in BigTechs than females.18 A possible explanation is that males may be more aware of the risks and disadvantages of the use of fintech products and services than females. This higher awareness of men may be caused by their higher financial literacy level (see e.g. Bucher-Koenen et al., 2017). Furthermore, the adoption rates of fintech products is also higher among males.19

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16 For the US sample, income is based on the following question: “Which category represents the total combined income of all members of your family (living here) during the past 12 months? This includes money from jobs, net income from business, farm or rent, pensions, dividends, interest, social security payments and any other money income received by members of your family who are 15 years of age or older.” Respondents had seventeen income categories to choose from.

17 Note that for the Netherlands health: fair-poor is 1 for the bottom three answers, whereas for the US this variable is 1 for the bottom two answers. As a robustness check, we took the bottom two answers for the Netherlands to construct an alternative variable health: not so good-poor. This variable is 1 for 5% of the respondents. We find negative relationships between this variable and trust and the change in trust. These are significant in case of trust in banks and the change in trust in other people. These results are available upon request.

18 Table 1 reports parameter estimates of ordered logit regressions. In the text we discuss the average marginal effects. These are the average changes in the probability of having a particular trust level when the explanatory variable increases by one unit. To construct the average marginal effect, we take the change in the probability for each individual and then compute the average.

19 Using global survey data, including the US and the Netherlands, Chen et al. (2021) find that, on average, 25% of the males reported having made use of services provided by fintech entrants over the past 6 months, against 21% of the females.
### Table 1
Public trust in the US: regression results

| (1) Trust in other people | (2) Trust in banks | (3) Trust in insurers | (4) Trust in BigTechs | (5) Trust in other people | (6) Trust in banks | (7) Trust in insurers | (8) Trust in BigTechs |
|--------------------------|-------------------|----------------------|----------------------|--------------------------|-------------------|---------------------|----------------------|
| Male                     |                   |                      |                      |                          |                   |                      |                      |
| -0.24**                  | -0.11             | -0.18**              | -0.39***             | -0.24**                  | -0.11             | -0.17*              | -0.39***             |
| (0.09)                   | (0.09)            | (0.09)               | (0.09)               | (0.09)                   | (0.09)            | (0.09)              | (0.09)               |
| Between 36 and 50        | 0.26              | 0.10                 | 0.29                 | 0.13                     | 0.27              | 0.11                | 0.30                 | 0.14                 |
| (0.20)                   | (0.21)            | (0.21)               | (0.20)               | (0.20)                   | (0.21)            | (0.21)              | (0.21)               | (0.20)               |
| Between 51 and 65        | 0.76**            | 0.36**               | 0.32                 | 0.15                     | 0.79***           | 0.38**              | 0.35**               | 0.16                 |
| (0.19)                   | (0.20)            | (0.20)               | (0.20)               | (0.19)                   | (0.20)            | (0.20)              | (0.20)               | (0.19)               |
| 66 and over              | 1.00***           | 0.88***              | 0.68***              | 0.27                     | 0.97***           | 0.87***             | 0.67***              | 0.27                 |
| (0.20)                   | (0.22)            | (0.22)               | (0.21)               | (0.20)                   | (0.22)            | (0.21)              | (0.21)               | (0.21)               |
| Education: high          | 0.24**            | 0.06                 | -0.06                | 0.02                     | 0.20**            | 0.04                | -0.08                | 0.01                 |
| (0.10)                   | (0.10)            | (0.09)               | (0.09)               | (0.10)                   | (0.10)            | (0.09)              | (0.09)               | (0.09)               |
| Income: USD 40,000-59,999|                   |                      |                      |                          |                   |                      |                      |
| 0.24*                    | 0.11              | -0.17                | -0.17                | 0.19                     | 0.09              | -0.20               | -0.18                |
| (0.14)                   | (0.13)            | (0.13)               | (0.13)               | (0.14)                   | (0.13)            | (0.13)              | (0.13)               |
| Income: USD 60,000-99,999| 0.39***           | 0.26*                | 0.31**               | 0.24*                    | 0.32**            | 0.24*               | 0.28**               | 0.22**               |
| (0.13)                   | (0.13)            | (0.13)               | (0.12)               | (0.13)                   | (0.13)            | (0.13)              | (0.13)               | (0.12)               |
| Income: ≥ USD 100,000    |                   |                      |                      |                          |                   |                      |                      |
| 0.41***                  | 0.27*             | 0.20                 | 0.08                 | 0.33**                   | 0.24*             | 0.17                | 0.06                 |
| (0.14)                   | (0.14)            | (0.13)               | (0.13)               | (0.14)                   | (0.14)            | (0.13)              | (0.13)               |
| Employed                 | -0.13             | 0.09                 | -0.02                | 0.09                     | -0.21**           | 0.05                | -0.05                | 0.08                 |
| (0.10)                   | (0.11)            | (0.10)               | (0.10)               | (0.11)                   | (0.11)            | (0.11)              | (0.11)               | (0.10)               |
| Partner                  | 0.19*             | 0.07                 | -0.03                | -0.03                    | 0.17*             | 0.07                | -0.04                | -0.03                |
| (0.10)                   | (0.10)            | (0.10)               | (0.10)               | (0.10)                   | (0.10)            | (0.10)              | (0.10)               | (0.10)               |
| Homeowner                | 0.29**            | 0.22*                | 0.14                 | -0.21**                  | 0.26**            | 0.21*               | 0.13                 | -0.22**              |
| (0.12)                   | (0.12)            | (0.11)               | (0.11)               | (0.12)                   | (0.12)            | (0.12)              | (0.12)               | (0.11)               |
| Urban area               | -0.11             | -0.10                | 0.16                 | 0.28***                  | -0.10             | -0.10               | 0.16                 | 0.28**               |
| (0.11)                   | (0.11)            | (0.11)               | (0.11)               | (0.11)                   | (0.11)            | (0.11)              | (0.11)               | (0.11)               |
| Trust in other people    |                   |                      |                      |                          |                   |                      |                      |
| 1.05***                  | 0.96***           | 0.69***              | 0.94***              | 0.68***                  | 1.03***           | 0.94***             | 1.03***              |
| (0.09)                   | (0.09)            | (0.08)               | (0.09)               | (0.08)                   | (0.09)            | (0.08)              | (0.09)               |
| Health: fair-poor        |                   |                      |                      |                          |                   |                      |                      |
| -0.67***                 | -0.28*            | -0.29**              | -0.13                | -0.14                    |                   |                     |                      |
| (0.14)                   | (0.14)            | (0.13)               | (0.13)               | (0.13)                   |                   |                     |                      |
| Number of observations   | 2,070             | 2,070                | 2,070                | 2,070                    | 2,070             | 2,070               | 2,070                |
| Wald $\chi^2$            | 121.4***          | 282.7***             | 208.7***             | 136.1***                 | 138.2***          | 287.0***            | 215.3***             |
| Log pseudolikelihood     | -1890.7           | -2044.4              | -2130.3              | -2197.8                  | -1877.5           | -2042.1             | -2127.7              |
| Pseudo R$^2$             | 0.03              | 0.07                 | 0.06                 | 0.03                     | 0.04              | 0.08                | 0.06                 |

Note: The table reports parameter estimates of ordered logit regressions. The first four columns present estimates of Eq. (1); the last four columns show estimates of Eq. (2). Robust standard errors are shown in parentheses. The dependent variables range from 1 (absolutely no trust) to 4 (a lot of trust). ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. Marginal effects are available upon request.
Higher educated Americans are 6 percentage points more likely to have somewhat or a lot of trust in other people than Americans with a lower level of education. However, trust in financial institutions and BigTechs is unrelated to the level of education. Trust in other people, banks and insurers increases with age. A positive income effect is present for Americans with an income of USD 40,000 or above for generalised trust. Americans with a household income of USD 60,000 or higher trust banks more than Americans with a lower income. Trust in insurers and BigTechs is highest among Americans with an income between USD 60,000 and USD 99,999. For example, compared to Americans with a household income below 40,000 USD, Americans with an income between USD 60,000 and USD 99,999 are 5 percentage points more likely to have a fair amount or a lot of trust in BigTechs. Trust is unrelated to being employed. Americans living with a partner have more trust in other people than other Americans. Wealthy Americans (proxied by homeownership) have more trust in other people and banks than poorer Americans. Trust in BigTechs is relatively high for Americans living in urban areas. Furthermore, we find that Americans who in general trust most other people have more trust in banks, insurance companies and in BigTechs than Americans with low trust in most other people. For example, Americans whit a lot of trust in other people are 58 percentage points more likely to have a fair amount or a lot of trust in banks than Americans with absolutely no trust in other people. The effect is 64 percentage points for insurers and 40 percentage points for trust in BigTechs.

Americans who assess their health to be fair or poor have lower trust in other people, financial institutions and BigTechs than Americans with good, very good, or excellent health (columns (5)-(8) in Table 1). This holds especially for generalised trust. For example, Americans with fair to poor health are 16 percentage points less likely to have a fair amount or a lot of trust in other people than Americans who assess their health to be good, very good or excellent. This is consistent with the results of some previous studies (cf. Miewes and Giordano, 2017). The effect is 5 percentage points for trust in banks, 6 percentage points for insurance companies, and 3 percentage points for trust in BigTechs.

The relationships between respondents’ characteristics and trust are often quite different for the Netherlands than for the US (columns (1)-(4) in Table 2). For instance, the estimates for public trust in the Netherlands suggest that males only have significantly lower trust in other people and in BigTechs than females. The lower trust in BigTechs among males is consistent with the finding that in the Netherlands men more often than women believe that BigTechs’ behaviour is not consistent with their customers’ interests (Bijlsma et al., 2022a). Men trust financial institutions as much as women.

The relationship with age is also very different than in the US. Trust in banks, insurers, and BigTechs is lowest among Dutch people between 51 and 65. For example, they are 13 percentage points less likely to have a fair amount or a lot of trust in insurance companies than Dutch people younger than 36. In line with the US findings, trust in other people is highest among people in the oldest age category. Trust in BigTechs is negatively related to the level of education. The effect of having a partner is only significant for trust in banks; people with a partner have relatively low trust. Dutch people living in an urban area have lower trust in banks, insurers, and BigTechs than Dutch people living elsewhere. Public trust in banks and insurers in the Netherlands is positively related to income. In line with the results for the US, there is a positive effect of homeownership on trust in banks and trust in other people. Similar to the results for the US, we find that generalised trust is positively related to age and education. We also find some positive (but non-linear) income effects, while generalised trust in the Netherlands is higher for people who are employed. Furthermore, as in the US, we find that generalised trust of Dutch people is positively related to their trust in financial institutions and BigTechs.

In line with the findings for the US, trust in financial institutions, BigTechs, and other people is higher among healthy people than among unhealthy people (columns (5)-(8) in Table 2). The likelihood that Dutch people trust other people, banks, insurers, and BigTechs is respectively 11, 5, 6, and 1 percentage points lower for people with fair to poor health than for people with good or excellent health.

4.2. The impact of the COVID-19 pandemic on public trust

This section presents the estimation results for Eqs. (3) and (4) on the impact of the COVID-19 pandemic on trust in financial institutions, BigTechs, and other people. Tables 3 and 4 present our estimation results for the US and the Netherlands, respectively. Our health variables are only considered in the last four columns of these tables.

We expect that trust among the elderly is most likely to be affected by the pandemic. Likewise, Oude Groeniger et al. (2021) argue that the risk of being severely affected by COVID-19 is substantially higher for people with poor health. We also expect a strong impact of the COVID-19 pandemic on trust among low-income respondents, as the lockdown measures taken to contain the pandemic will particularly affect those in a poor financial position (Oude Groeniger et al., 2021).

Similar to our previous results for the level of trust, we find that the relationship with personal characteristics is country-specific when we focus on the impact of the COVID-19 pandemic on trust (columns (1)-(4) in Tables 3 and 4). For example, in the Netherlands the negative effect of the pandemic on trust in other people is larger for men than women, whereas there is no significant gender effect in the regressions for the US. In both countries the negative effect of the pandemic on trust in BigTechs is larger for men than women. The findings for age are also different. Americans above 35 saw less negative impact of the pandemic on their trust in other people than those aged 35 or below (the reference group). In the Netherlands, only people older than 65 express a lower decline of generalised trust than Dutch people aged 35 or below. Another example is the effect of income. For the Netherlands, we find a positive effect of income on the change in trust in banks, insurers, and BigTechs. For the US, we find that people with a household income between USD 40,000 and 59,999 have a 0.27 lower change in trust in BigTechs than people with a lower income. However, there is no significant difference in the change trust in BigTechs between people with an income of USD 60,000 or above and people in the lowest income.
Table 2
Public trust in the Netherlands: regression results

|                        | (1) Trust in other people | (2) Trust in banks | (3) Trust in insurers | (4) Trust in BigTechs | (5) Trust in other people | (6) Trust in banks | (7) Trust in insurers | (8) Trust in BigTechs |
|------------------------|---------------------------|-------------------|----------------------|-----------------------|---------------------------|-------------------|----------------------|-----------------------|
| Male                   | -0.18**                   | -0.08             | -0.05                | -0.31***              | -0.19**                   | -0.08             | -0.04                | -0.28***              |
|                        | (0.09)                    | (0.08)            | (0.08)               | (0.08)                | (0.10)                    | (0.08)            | (0.08)               | (0.09)                |
| Between 36 and 50      | -0.18                     | -0.13             | -0.14                | -0.02                 | -0.15                     | -0.11             | -0.17                | 0.04                  |
|                        | (0.17)                    | (0.14)            | (0.14)               | (0.14)                | (0.18)                    | (0.15)            | (0.15)               | (0.15)                |
| Between 51 and 65      | 0.31*                     | -0.58***          | -0.58***             | -0.33**               | 0.42**                    | -0.49***          | -0.53***             | -0.25*                |
|                        | (0.16)                    | (0.13)            | (0.13)               | (0.14)                | (0.17)                    | (0.14)            | (0.14)               | (0.15)                |
| 66 and over            | 0.45***                   | -0.34**           | -0.41***             | -0.30**               | 0.56***                   | -0.35**           | -0.41***             | -0.26                 |
|                        | (0.17)                    | (0.14)            | (0.14)               | (0.15)                | (0.18)                    | (0.15)            | (0.15)               | (0.16)                |
| Education: high        | 0.57***                   | -0.08             | -0.21**              | -0.34***              | 0.57***                   | -0.11             | -0.22**              | -0.40***              |
|                        | (0.10)                    | (0.09)            | (0.08)               | (0.09)                | (0.11)                    | (0.11)            | (0.09)               | (0.10)                |
| Income: EUR 1,800-2,800| 0.35***                   | 0.09              | 0.14                 | -0.11                 | 0.28**                    | 0.02              | 0.07                 | -0.14                 |
|                        | (0.13)                    | (0.11)            | (0.11)               | (0.11)                | (0.14)                    | (0.09)            | (0.09)               | (0.10)                |
| Income: EUR 2,800-3,900| 0.14                      | 0.28**            | 0.28**               | -0.00                 | 0.07                      | 0.24*             | 0.20                 | -0.02                 |
|                        | (0.14)                    | (0.12)            | (0.12)               | (0.12)                | (0.15)                    | (0.13)            | (0.13)               | (0.13)                |
| Income: > EUR 3,900    | 0.54***                   | 0.33**            | 0.34**               | 0.20                  | 0.49***                   | 0.30**            | 0.27**               | 0.25*                 |
|                        | (0.15)                    | (0.14)            | (0.13)               | (0.14)                | (0.16)                    | (0.15)            | (0.15)               | (0.15)                |
| Employed               | 0.21*                     | -0.08             | -0.05                | 0.17                  | 0.15                      | -0.14             | -0.06                | 0.17                  |
|                        | (0.13)                    | (0.11)            | (0.11)               | (0.11)                | (0.14)                    | (0.09)            | (0.09)               | (0.12)                |
| Partner                | -0.11                     | -0.17**           | -0.07                | -0.02                 | -0.12                     | -0.21*            | -0.09                | -0.06                 |
|                        | (0.11)                    | (0.10)            | (0.10)               | (0.10)                | (0.12)                    | (0.11)            | (0.11)               | (0.10)                |
| Homeowner              | 0.37***                   | 0.20**            | 0.04                 | -0.07                 | 0.38***                   | 0.21**            | 0.03                 | -0.07                 |
|                        | (0.11)                    | (0.10)            | (0.10)               | (0.10)                | (0.12)                    | (0.10)            | (0.09)               | (0.10)                |
| Urban area             | -0.05                     | -0.21**           | -0.15*               | -0.17**               | -0.06                     | -0.21**           | -0.16*               | -0.16*                |
|                        | (0.09)                    | (0.08)            | (0.08)               | (0.08)                | (0.10)                    | (0.09)            | (0.09)               | (0.09)                |
| Trust in other people  | 0.96***                   | 0.93***           | 0.73***              | 0.94***               | 0.92***                   | 0.75***           | 0.92***              | 0.75***               |
|                        | (0.08)                    | (0.08)            | (0.08)               | (0.08)                | (0.09)                    | (0.09)            | (0.08)               | (0.08)                |
| Health: fair-poor      | -0.069***                 | -0.24**           | -0.28***             | -0.08                 |                          |                   |                      |                       |
|                        | (0.11)                    | (0.10)            | (0.09)               | (0.10)                |                          |                   |                      |                       |
| Number of observations | 2,534                     | 2,534             | 2,534                | 2,534                 | 2,229                     | 2,229             | 2,229                | 2,229                 |
| Wald χ²                | 107.3***                  | 176.2**           | 178.5***             | 140.7***              | 150.4***                  | 173.3***          | 171.7***             | 135.5***              |
| Log pseudolikelihood   | -1896.0                   | -2428.1           | -2520.3              | -2468.2               | -1656.6                   | -2139.1           | -2222.2              | -2161.0               |
| Pseudo R²              | 0.03                      | 0.04              | 0.04                 | 0.03                  | 0.05                      | 0.04              | 0.04                 | 0.03                  |

Note: The table reports parameter estimates of ordered logit regressions. The first four columns present estimates of Eq. (1); the last four columns show estimates of Eq. (2). Robust standard errors are shown in parentheses. The dependent variables range from 1 (absolutely no trust) to 4 (a lot of trust). ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively. Marginal effects are available upon request.
Table 3
Change of public trust in the US due to the COVID-19 pandemic: regression results

|                                | (1) Change in trust in other people | (2) Change in trust in banks | (3) Change in trust in insurers | (4) Change in trust in BigTechs | (5) Change in trust in other people | (6) Change in trust in banks | (7) Change in trust in insurers | (8) Change in trust in BigTechs |
|--------------------------------|------------------------------------|------------------------------|---------------------------------|---------------------------------|------------------------------------|------------------------------|---------------------------------|---------------------------------|
| Male                           | -0.01 (0.08)                       | -0.05 (0.06)                 | -0.11 (0.06)                    | -0.39*** (0.09)                 | -0.01 (0.08)                       | -0.05 (0.06)                 | -0.10 (0.06)                      | -0.39*** (0.09)                 |
| Between 36 and 50              | 0.44** (0.21)                      | 0.13 (0.14)                  | 0.05 (0.15)                     | 0.17 (0.19)                     | 0.45** (0.21)                      | 0.13 (0.14)                  | 0.05 (0.15)                      | 0.17 (0.19)                     |
| Between 51 and 65              | 0.44** (0.20)                      | -0.08 (0.14)                 | -0.15 (0.14)                    | -0.45** (0.19)                  | -0.08 (0.20)                      | -0.14 (0.14)                 | -0.18 (0.19)                     | -0.08 (0.20)                    |
| 66 and over                    | 0.46** (0.21)                      | 0.12 (0.14)                  | 0.02 (0.15)                     | -0.18 (0.20)                    | 0.45** (0.21)                      | 0.12 (0.14)                  | 0.02 (0.15)                      | -0.18 (0.20)                    |
| Education: high                | 0.04 (0.09)                        | 0.07 (0.06)                  | 0.11 (0.07)                     | 0.12 (0.10)                     | 0.02 (0.09)                        | 0.07 (0.06)                  | 0.10 (0.07)                      | 0.13 (0.08)                     |
| Income: USD 40,000-59,999      | -0.01 (0.14)                       | 0.06 (0.10)                  | 0.02 (0.11)                     | -0.27 (0.15)                    | -0.04 (0.10)                       | 0.06 (0.11)                  | 0.02 (0.11)                      | -0.27* (0.11)                   |
| Income: USD 60,000-99,999      | 0.02 (0.11)                        | -0.01 (0.09)                 | 0.17* (0.10)                    | 0.00 (0.14)                     | -0.01 (0.11)                       | -0.02 (0.09)                 | 0.16 (0.10)                      | 0.00 (0.11)                     |
| Income: ≥ USD 100,000          | -0.23* (0.13)                      | 0.08 (0.09)                  | 0.16 (0.11)                     | -0.01 (0.15)                    | -0.28** (0.13)                     | 0.08 (0.11)                  | 0.15 (0.11)                      | -0.01 (0.15)                    |
| Employed                       | 0.01 (0.09)                        | -0.01 (0.07)                 | -0.05 (0.08)                    | -0.08 (0.11)                    | -0.03 (0.09)                       | -0.01 (0.07)                 | -0.06 (0.08)                     | -0.08 (0.11)                    |
| Partner                        | 0.00 (0.09)                        | 0.04 (0.07)                  | -0.02 (0.08)                    | -0.01 (0.11)                    | -0.09 (0.09)                       | 0.04 (0.07)                  | -0.02 (0.08)                     | -0.01 (0.11)                    |
| Homeowner                      | 0.19* (0.09)                       | 0.15* (0.08)                 | 0.09 (0.09)                     | -0.23** (0.12)                  | -0.17 (0.11)                       | 0.14* (0.08)                 | -0.09 (0.09)                     | -0.32*** (0.12)                 |
| Urban area                     | 0.08 (0.09)                        | 0.03 (0.08)                  | 0.12 (0.09)                     | 0.30** (0.12)                   | 0.08 (0.08)                        | 0.03 (0.08)                  | 0.12 (0.09)                      | 0.30** (0.12)                   |
| Change in trust in other people| 0.46*** (0.09)                     | 0.45*** (0.07)               | 0.45*** (0.08)                  | 0.45*** (0.09)                  | 0.46*** (0.07)                     | 0.45*** (0.08)               | 0.45*** (0.09)                   | 0.45*** (0.12)                  |
| Health: fair-poor              |                                   |                              |                                |                                 |                                   |                              |                                 |                                 |
| Constant                       | 4.04*** (0.23)                     | 2.60*** (0.20)               | 2.45*** (0.21)                  | 2.26*** (0.26)                  | 4.16*** (0.23)                     | 2.61*** (0.20)               | 2.48*** (0.21)                   | 2.25*** (0.27)                  |
| Number of observations         | 2,069                             | 2,069                        | 2,069                           | 2,069                           | 2,069                             | 2,069                        | 2,069                           | 2,069                           |
| R-squared                      | 0.01                              | 0.28                         | 0.24                            | 0.15                            | 0.01                              | 0.28                         | 0.24                            | 0.15                            |

Note: The table reports parameter estimates of linear regressions. The first four columns present estimates of Eq. (3); the last four columns show estimates of Eq. (4). Robust standard errors are shown in parentheses. The dependent variables range from 0 (decreased very strongly) to 10 (increased very strongly). ***, ** and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively.
Table 4  
Change of public trust in the Netherlands due to the COVID-19 pandemic: regression results

|                          | (1) Change in trust in other people | (2) Change in trust in banks | (3) Change in trust in insurers | (4) Change in trust in BigTechs | (5) Change in trust in other people | (6) Change in trust in banks | (7) Change in trust in insurers | (8) Change in trust in BigTechs |
|--------------------------|-------------------------------------|------------------------------|--------------------------------|--------------------------------|-------------------------------------|------------------------------|--------------------------------|--------------------------------|
| Male                     | -0.10**                             | -0.04                        | -0.02                          | -0.15***                       | -0.11**                             | -0.05                        | -0.04                          | -0.15***                       |
| 30 and under             | (0.05)                              | (0.04)                       | (0.04)                          | (0.05)                         | (0.05)                              | (0.04)                       | (0.04)                          | (0.06)                         |
| Between 36 and 50        | -0.10                               | -0.09                        | -0.15**                         | -0.11                          | -0.05                               | -0.05                        | -0.12                          | -0.05                          |
| 66 and over              | 0.10                                | -0.15**                      | -0.17**                         | -0.17**                        | 0.14**                              | -0.13**                      | -0.14**                        | -0.13                          |
| Between 51 and 65        | (0.08)                              | (0.07)                       | (0.07)                          | (0.09)                         | (0.08)                              | (0.07)                       | (0.07)                          | (0.09)                         |
| 66 and over              | 0.26***                             | -0.03                        | -0.03                           | -0.20**                        | 0.28***                             | -0.02                        | -0.02                          | -0.19**                        |
| Education: high          | 0.03                                | 0.05                         | 0.04                            | -0.06                          | 0.03                                | 0.05                         | 0.04                           | 0.07                           |
| Income: EUR 1,800-2,800  | (0.07)                              | (0.06)                       | (0.06)                          | (0.08)                         | (0.07)                              | (0.06)                       | (0.05)                          | (0.06)                         |
| Income: EUR 2,800-3,900  | -0.01                               | 0.20**                       | 0.16**                          | 0.20**                         | -0.01                               | 0.19**                       | 0.14**                         | 0.17**                         |
| Income: > EUR 3,900      | (0.07)                              | (0.06)                       | (0.07)                          | (0.09)                         | (0.07)                              | (0.07)                       | (0.07)                          | (0.09)                         |
| Employed                 | 0.12**                              | 0.13*                        | 0.13*                           | 0.16*                          | 0.11                                | 0.12                         | 0.12                           | 0.15                           |
| Partner                  | (0.08)                              | (0.07)                       | (0.07)                          | (0.09)                         | (0.08)                              | (0.07)                       | (0.07)                          | (0.08)                         |
| Homeowner                | 0.12**                              | 0.05                         | 0.10                            | 0.15**                         | 0.11                                | 0.02                         | 0.08                           | 0.12                           |
| Urban area               | (0.07)                              | (0.06)                       | (0.06)                          | (0.08)                         | (0.07)                              | (0.06)                       | (0.07)                          | (0.08)                         |
| Partner                  | 0.02                                | -0.03                        | 0.02                            | 0.03                           | 0.02                                | -0.00                        | 0.02                           | -0.00                          |
| Homeowner                | (0.06)                              | (0.05)                       | (0.06)                          | (0.07)                         | (0.06)                              | (0.06)                       | (0.06)                          | (0.08)                         |
| Urban area               | (0.06)                              | (0.05)                       | (0.05)                          | (0.07)                         | (0.06)                              | (0.06)                       | (0.06)                          | (0.07)                         |
| Change in trust in other people | 0.38***                        | 0.36**                       | 0.36**                          | 0.36**                         | 0.36**                              | 0.36**                       | 0.35**                          | 0.35**                         |
| Health: fair-poor        | (0.05)                              | (0.04)                       | (0.04)                          | (0.04)                         | (0.04)                              | (0.04)                       | (0.04)                          | (0.04)                         |
| Constant                 | 4.69***                             | 2.87***                      | 2.94***                         | 2.64***                        | 4.76***                             | 2.97***                      | 3.03***                        | 2.75***                        |
| (0.10)                   | (0.18)                              | (0.19)                       | (0.21)                          | (0.10)                         | (0.19)                              | (0.19)                       | (0.20)                          | (0.23)                         |
| Number of observations   | 2,529                               | 2,529                        | 2,529                           | 2,529                          | 2,229                               | 2,225                        | 2,225                           | 2,225                           |
| R-squared                | 0.01                                | 0.17                         | 0.14                            | 0.10                           | 0.02                                | 0.15                         | 0.14                            | 0.10                           |

Note: The table reports parameter estimates of linear regressions. The first four columns present estimates of Eq. (3); the last four columns show estimates of Eq. (4). Robust standard errors are shown in parentheses. The dependent variables range from 0 (decreased very strongly) to 10 (increased very strongly). ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 level, respectively.
category. Americans’ change in trust in banks is unrelated to their household income. In case of insurers, there is only a positive significant effect of income: ≥ USD 100,000. We also find that Americans with an income of USD 100,000 or more have a 0.23 lower change in trust in other people than Americans with an income below USD 40,000. For the Netherlands, the change in trust in other people is not significantly related to income. We thus only find evidence for the Netherlands and only for trust in financial institutions and BigTechs that trust among low-income respondents in particular has declined due to the COVID-19 pandemic.

For both the US and the Netherlands, we find a positive relationship between changes in generalised trust due to the pandemic and changes in trust in financial institutions and BigTechs. For both countries the estimated effects of a 1-point change in generalised trust on changes in trust in financial institutions and BigTechs are smaller than 1, suggesting that the impact of the pandemic on people’s trust in other people is only partially transmitted to their trust in financial institutions and BigTechs. These effects are somewhat larger in the US than in the Netherlands. For the US, we find that a 1-point increase in generalised trust goes together with 0.45-0.46 higher change in trust in financial institutions and BigTechs, while in the Netherlands these effects range between 0.36 and 0.38.

Finally, our results suggest that respondents with poor health are most likely to have experienced a trust decline due to the pandemic, although there are some differences across both countries in this regard. For the Netherlands, we find that health is related to changes in trust in financial institutions, BigTechs and other people, while for the US we only find a significant health effect for changes in trust in other people. Consistent with our expectation, the results suggest that people with poor health are most likely to say that the COVID-19 pandemic has resulted in lower trust. A possible explanation is that people with poor health are more likely to have had negative personal crisis experiences, resulting in lower trust.

4.3. Sensitivity analysis

Our first robustness test shows that our findings for the change in the level of trust are largely robust for the use of ordered logit regressions instead of linear regressions. The results for the US and the Netherlands are shown in Tables D.1 and D.2 in Appendix D, respectively. Although there are some variables that lose significance or become significant, the direction of the effects as previously reported does not change.

This also holds for our second sensitivity test, which examines whether our results change when we include ethnicity in the set of personal characteristics. Some previous studies using US data suggest that ethnicity and race are related to trust (cf. Armantier et al., 2021). We created a dummy capturing whether the respondent is born in the US or not (1=yes, 0=no). Columns (1)-(4) in Table D.3 show regression results for the level of trust, while columns (1)-(4) in Table D.4 present the results for the change in trust (both tables are shown in Appendix D). Americans born in the US have higher trust in other people than Americans born elsewhere. Trust in insurers, banks and BigTechs is unrelated to being US-born. We do not find differences between the change in trust among Americans born in the US or elsewhere.

In addition, we run regressions with four race dummies (African American, Native American or Alaskan Native, Asian or Pacific Islander, and other race) and Hispanic / Latino (of any race) (see columns (5)-(8) in Tables D.3 and D.4). The four race dummies are 1 for respondents with the specific race and 0 for other respondents. Hispanic / Latino (of any race) captures whether the respondent is Hispanic or Latino (1=yes, 0=no). The reference person is Non-Hispanic White. We find that African Americans have lower trust in other people and banks, but higher trust in BigTechs than White Americans. People within the “other race” category also report relatively low trust in banks. Compared to White Americans, Asian Americans have lower generalised trust. Hispanic people have lower trust in other people and in banks than non-Hispanic people, but higher trust in BigTechs. There are no trust differences between people falling within the “Native American or Alaskan Native” category and White Americans. Experiences of racism and exclusion in the past – also by banks – are a possible explanation why ethnicity and race are negatively related to trust in other people and banks.

The change in trust during the COVID-19 pandemic also depends on race and being Hispanic. African Americans saw their trust in other people and BigTechs decline less than White Americans. The decline of trust of people within the “Asian or Pacific Islander”, “Native American or Alaskan Native” or “Other race” category does not differ significantly from the decline of trust of White Americans. Last, the decline of generalised trust and trust in BigTechs is lower among Hispanic people than among non-Hispanic people.

Ethnicity is not a standard background characteristic included in the Dutch dataset. Centerdata provided us with the most recent Centerpanel data on people’s origin. These data were collected in 2014 and cover a large part of our sample. We run regressions with the variable immigrant. This variable is one for respondents with at least one parent born outside the Netherlands. For other respondents the variable immigrant is zero. In addition, we run regressions with more detailed immigrant dummies: Western immigrant first-generation, non-Western immigrant first-generation, Western immigrant second-generation and non-Western immigrant second-generation. These variables take into account whether the immigrant has a Western or non-Western background and whether the immigrant was born in the Netherlands (yes=second-generation immigrant, no=first-generation immigrant).

For the Netherlands, immigrants report lower levels of generalised trust compared to non-immigrants. Immigrants are 9 percentage points less likely to have a fair amount or a lot of trust in other people (column 1 of Table D.5 in Appendix D). There are no differences across immigrants and non-immigrants in trust in banks, insurers, and BigTechs. The negative association with generalised trust is significant for both first-generation immigrant groups and for the non-Western second-generation immigrants. The change in trust in insurers and BigTechs during the COVID-19 pandemic also depends on being
an immigrant, whereas there is no immigrant effect in case of generalised trust and trust in banks (Table D.6 in Appendix D). The decline of trust in insurers and BigTechs was 0.2 higher among immigrants than among non-immigrants.

Third, the results of regressions with alternative health indicators for the Netherlands confirm that trust is relatively low for people with poor health and that their decline of trust during the pandemic is larger than that of healthy people. As self-assessed health may differ from actual health, we use some objective health indicators in our analysis of public trust in the Netherlands (these indicators are not available in the US database). We include three health variables: chronic disease, smoker, and drinker. Chronic disease is a dummy that captures whether the respondent suffers from a long-lasting illness, disorder, handicap or the consequences of an accident (1=yes, 0=no). Smoker is 1 for respondents who smoke cigarettes and 0 for non-smokers. Drinker is 1 for respondents who on average have more than 4 alcoholic drinks a day and 0 for other respondents. The results are shown in Table D.7 in Appendix D. Compared to other people, with a chronic disease report lower trust in banks, insurers, and BigTechs. People with a chronic disease also report a relatively high loss of trust in other people and BigTechs due to the COVID-19 pandemic. The level of trust and the change in trust are unrelated to being a smoker and/or drinker.

Last, our findings are largely robust when including financial literacy. Some previous studies suggest that financial literacy is positively related to public trust (cf. van der Cruijsen et al., 2021). Our US database does not offer information on financial literacy. For the Netherlands, we have information on respondents’ self-assessed financial literacy. We include three financial knowledge dummy variables: more-or-less knowledgeable, knowledgeable, and very knowledgeable. These dummy variables are 1 for respondents with the respective financial knowledge level and 0 for other respondents. The reference category is not knowledgeable. We find that financial knowledge is positively related to trust in insurers and this trust is highest among people who think they are very knowledgeable (see Table D.8 in Appendix D). For the other trust levels, we find a non-linear relationship between financial knowledge and trust. Compared to people who are not knowledgeable, people who self-assess to be more-or-less knowledgeable or knowledgeable have more trust in other people and BigTechs. There is, however, no significant difference in trust between people with the highest level of financial knowledge and people who are not knowledgeable. In case of trust in banks, there is only a significant positive effect for the variable more-or-less knowledgeable. Very knowledgeable people experienced a less negative change in trust in BigTechs as a result of the pandemic than people who are not knowledgeable (see Table D.9 in Appendix D).

5. Conclusions

Using two large-scale surveys among households, we examine the drivers of public trust in banks, insurance companies, BigTechs, and other people in the Netherlands and the US, and analyse whether the COVID-19 pandemic has affected public trust. By asking very similar questions in both surveys, we are able to compare differences in the drivers of (changes in) public trust across both countries. These countries differ along various dimensions, such as the dependence of firms and households on bank credit and their levels of generalised trust (whereas the US is a low-trust country, generalised trust in the Netherlands is among the highest in the world).

Our results suggest that the COVID-19 pandemic did not have much effect on trust in financial institutions in the Netherlands and the US. Financial institutions were in good health prior to the pandemic, which enabled them to continue providing credit to entrepreneurs and households and carrying out other important financial services during the largest global economic downturn ever. By doing so, they helped absorb a large part of the potential impact of the pandemic, also supported by measures taken by central banks and banking supervisors. This may explain why trust in financial institutions did not decline during the pandemic.

In contrast, trust in BigTechs declined in both countries during the pandemic. Low trust in BigTechs may raise financial stability concerns in view of the increasing role of BigTechs in financial services. Due to network effects, the role of BigTechs may grow rapidly and lead to various concentration risks: 1) in the provision of financial services, 2) the distribution of financial services and 3) concentration risks in consumer data. However, the existing regulatory frameworks are not yet adapted to respond to the possible consequences of the augmenting role of BigTechs in financial markets (DNB, 2021). Therefore, regulators may need to adjust the relevant regulatory frameworks to address these risks. International cooperation will be necessary as BigTechs operate across borders.

The negative impact of the COVID-19 pandemic on trust in other people was stronger in the US than in the Netherlands. This could reflect the fact that US unemployment increased to very high levels, while unemployment in the Netherlands increased only slightly. That interpretation would be consistent with the finding of Frieh and Marcus (2021) that involuntary job loss reduces respondents’ trust in other people. The quite generous social assistance offered in the Netherlands to those who lost their job may play a role here as well.

Our findings underscore the importance of government policies that aim to improve public health and combat pandemics, as these are also beneficial from a trust perspective. For both countries, we find evidence that individuals with poor health have lower levels of trust. Apparently, concerns about one’s health, which may have become more aggravated during the COVID-19 pandemic, affect public trust. Further research on the importance of individual health for public trust seems warranted.

Finally, in designing policies to improve trust it is important to consider that demographic drivers of (changes in) trust are country-specific, as our research shows. Take trust in banks as an example. In the Netherlands, policies to enhance trust in banks should be targeted at people between the ages of 51 and 65 as these people have a relatively low level of trust in
banks, whereas people in this age category in the US have a relatively high level of trust in banks. Building trust is not easy, but worth the effort.

**Declaration of Competing Interest**

None.

**Supplementary materials**

Supplementary material associated with this article can be found in the online version, at doi: 10.1016/j.jebo.2022.07.006.

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