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Insurance demand and extreme events: Evidence from the Covid-19 pandemic

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ABSTRACT

Understanding how individuals change their financial behaviour in response to large-scale extreme events is increasingly important in a world facing rising systemic risks, from pandemics to climate change. The Covid-19 pandemic offers a unique opportunity to study such behavioural responses, particularly in relation to insurance demand. Our study analyses the relationship between Covid-19 contraction and individuals' interest to take out insurance, using representative survey data collected in Italy in 2021. We find that the direct experience of such an extreme event is positively correlated with higher interest in purchasing insurance, and the magnitude of this association increases with the severity of the event. Also, women exhibited greater sensitivity to the risky event, displaying increased insurance interest even at low event severity levels. Our results highlight how adverse external shocks are associated with changes in insurance-related behaviour.

1. Introduction

Understanding the determinants of insurance demand is a central question in economic and financial research. While extensive literature has explored how risk perception affects financial decision-making (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992), little empirical evidence exists regarding how direct exposure to adverse external shocks influences insurance choices. Given the subjective nature of risk perception, individuals' willingness to purchase protection may be shaped by personal experiences, which can either reinforce precautionary actions or lead to a diminished sense of vulnerability over time (Bernile et al., 2017; Deryugina, 2013).

To address this gap, the present study focuses specifically on Covid-19 as an exemplary adverse extreme event, investigating how direct exposure to such a significant external shock is correlated with a higher interest in insurance coverage. We argue that experiencing severe external shocks, such as being directly hit by the pandemic, may update individuals' belief over the likelihood of uncertain and infrequently observed events and consequently strengthen their intention to consider insurance protection. This aligns with behavioural finance theories on heuristics and cognitive bias (Tversky & Kahneman, 1982), which suggest that individuals can adjust their financial preferences in response to perceived threats (Kunreuther et al., 1978). While prior research has explored the effects of the exposure to natural disasters on financial behaviours (Bernile et al., 2017; Gallagher, 2014), there has been limited examination of how Covid-19 affected the insurance demand. Indeed, Qian (2021) and Chen et al. (2023) found a positive correlation

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between Covid-19 infections and insurance company revenues and purchases in China, but they focused on macroeconomic data without observing individual-level responses to the direct exposure to the extreme event. Therefore, these studies could not capture the impact of different event severity levels on insurance demand. The current study addresses these limitations by adopting a micro-level perspective and leveraging granular individual data.

To address our research question, we rely on nationally representative survey data gathered in 2021 by the Italian Financial Education Committee. Italy provides a relevant context to analyse how the exposure to a significant external event like Covid-19 affected the potential insurance demand, as the country was among the earliest and hardest hit in Europe, with over 16 million confirmed cases and more than 160000 Covid-related deaths recorded between 2020 and 2022 (ISTAT, 2022). At the same time, Italy is characterised by a universal, tax-financed public healthcare system. This makes the Italian context particularly informative for analysing how direct exposure to extreme events relates to insurance interest in a setting where a substantial baseline level of public protection is already in place. Comparative research shows that insurance demand is strongly shaped by welfare regimes and public risk coverage, with universal public systems potentially crowding out private insurance demand, especially for health-related risks (Brown & Finkelstein, 2008; Cutler & Gruber, 1996). Yet even in universal systems, the public-private boundary can shift. For instance, in the UK, policy changes have weakened entitlement to free state-provided care and coincided with greater private-sector use, especially among higher-income groups (Propper, 2000). Evidence from Sweden and the United States indicates that even within mixed healthcare systems, broadly comparable per-capita public health spending can coincide with very different reliance on private financing. Indeed, private insurance is substantially higher in the U.S., whereas Sweden's social-democratic welfare-state model assigns private health insurance a more limited and nuanced role. One possible explanation lies in differences in system satisfaction and perceived fairness, with overall satisfaction levels considerably lower in the U.S. than in Sweden (Dave et al., 2024). Furthermore, beyond institutional factors, cross-country variation in insurance demand is also influenced by cultural dimensions such as risk attitudes and trust in public institutions (Beck & Webb, 2003). Overall, these considerations support the analysis of the Italian context to examine whether behavioural responses to direct exposure to extreme events arise even in the presence of extensive public coverage, shedding light on the role of heightened risk awareness in insurance-related behaviour.

Our findings show that having experienced an extreme and risky event like the Covid-19 is significantly associated with a higher likelihood of considering insurance policies. Moreover, the magnitude of the coefficient was bigger for those who were exposed to more severe scenarios, as they showed an even higher interest in purchasing insurance. Also, women reacted more to the direct experience of the extreme event, as they showed a more pronounced interest in seeking insurance-related information even in less severe cases.

Our contribution to the literature is threefold. First, we investigate how extreme events are associated with insurance interest, leveraging the pandemic as an exogenous shock, hence going beyond the study of natural disasters (Kunreuther & Pauly, 2018; Lin, 2020; Yin et al., 2016). We also focus on the role played by the severity of the experience, expecting individuals facing more severe events to react more to the shock. Second, we extend the literature on insurance demand (Gallagher, 2014; Luciano et al., 2016; Pitthan & De Witte, 2021) by analysing the factors associated with the interest in purchasing insurance, using a nationally representative sample of Italian households. Third, we conduct a gender-based analysis to determine whether the behaviour following a shock significantly differs between men and women, in line with existing literature suggesting that financial risk perception and precautionary behaviour may vary by gender (Gandolfi & Miners, 1996; Luciano et al., 2016; Outreville, 2014).

The rest of the paper is structured as follows. Section 2 reviews the literature on insurance demand and behavioural responses. Section 3 outlines the methodology and Section 4 presents the empirical findings. Finally, Section 5 draws the conclusions and discusses the implications.

2. Literature review

The literature on insurance demand is quite scarce and presents several unsolved puzzles (Pitthan & De Witte, 2021). As highlighted by Gomes et al. (2021) and Koijen and Yogo (2022), insurance is a field of research that has been relatively overlooked, where little is known about the determinants of heterogeneous households' insurance demand.

Central to this strand of research is the expected utility framework. Assuming the rationality of economic agents, Mossin (1968) modelled insurance demand through an expected utility function, embedding the concept of relative risk aversion developed by Pratt (1964) and Arrow (1965). According to this framework, if an increase in an individual's wealth leads to a more significant portion of wealth being allocated to risky assets, then the individual exhibits decreasing relative risk aversion; in other words, they become less risk averse. Therefore, insurance coverage is a function of wealth maximization given the probability of an expected future loss, with risk aversion being a central determinant of consumer choices. However, empirical evidence does not fully support the predictions of this theoretical framework. For instance, Greene's (1963) seminal work did not find a significant relationship between individuals' risk attitudes and prior insurance uptake. His subsequent experimental study in 1964 further revealed no evidence that insurance purchasing behaviours could be predicted based on risk-taking behaviours (Greene, 1964). Similarly, Murray (1971), (1972) documented that individually assessed utility functions failed to predict insurance consumption decisions accurately. Additionally, Slovic et al. (1977) showed through laboratory experiments that individuals prefer to insure against events with a moderately high probability of causing a relatively small loss rather than against low-probability, high-loss events. This behaviour is contrary to the expected utility framework as it implies a convex utility function. Several empirical studies have confirmed these findings, which challenge traditional utility theory. Recently, Browne et al. (2015), using data from German insurers, demonstrated a lower demand for insurance against catastrophic events compared to bicycle theft coverage. Similarly, Botzen and van den Bergh (2012) documented that a large proportion of homeowners in the Netherlands neglect the low probability of flooding and avoid purchasing insurance for this risk, even

though climate change increases the likelihood of such events.

Since the expected utility framework failed to account for observed patterns in insurance demand, the literature has shifted toward behavioural and cognitive explanations to address these empirical discrepancies. Central to this body of work are the contributions of Kahneman and Tversky (1979) and Tversky and Kahneman (1992), who argued that people's decision-making is subject to several biases stemming from heuristics, which can lead to irrational choices. This relates to the well-known Prospect Theory (Kahneman & Tversky, 1979), which predicts that individuals evaluate their choices based on gains and losses from a reference point rather than the prospect's effect on total expected wealth, exhibiting a higher aversion for losses. Because losses are perceived more strongly than gains of the same magnitude, boundedly rational consumers might perceive pure protection insurance, such as term life insurance, as a risky investment because they could lose their premiums if a bad event does not occur within the specified term (Pitthan & De Witte, 2021). As a result, individuals susceptible to potential loss may choose not to purchase such an insurance. Instead, they may prefer a safer strategy to prepare for uncertain future events by increasing their precautionary savings (Hwang, 2021). Building on Kahneman and Tversky (1979), (1992), Schmidt (2016) used a Prospect Theory value function to investigate insurance demand. This model provides a theoretical explanation for why individuals are reluctant to insure against rare losses, even at subsidized premiums (Kunreuther & Pauly, 2004), while simultaneously opting for insurance against moderate risks at significantly higher loaded premiums.

The availability and representativeness heuristics, which refer to determining the probability of an event based on salient events or a limited sample of information, can lead individuals to overestimate the likelihood of an event occurring. These heuristics may help understand how individuals perceive risks. A study by Deryugina (2013), who analysed how individuals update their beliefs following abnormal local temperature, found that people do not update their inferences in a Bayesian manner due to biases from availability and representativeness heuristics. Existing studies suggest that external shocks shape individuals' choices in complex ways. For example, Bernile et al. (2017) provided evidence that early-life exposure to natural disasters influences CEOs' behaviour. They found that a moderate exposure was associated with riskier corporate policies, while experiencing extreme disaster fatalities led to greater caution in approaching corporate risk-taking. This perspective aligns with the broader conjecture that personal experiences of risky situations shape financial decision-making, particularly in response to unforeseen events. In this regard, further research has employed these heuristics to explain insurance demand during rare events and natural disasters. Gallagher (2014), using a dataset of large regional floods from 1980 to 2007 and flood insurance demand in the United States, demonstrated that after the occurrence of these extreme events, the demand for flood insurance increased in the affected areas but then quickly decayed to baseline levels. Similarly, Turner et al. (2014) found that people who experienced severe consequences of the 2010 flood in Pakistan demanded more insurance protection compared to those less affected. In an experimental setting, Yin et al. (2016) showed that, when individuals experience their first typhoon, the availability heuristic dominates their decision process, leading to an increase in insurance demand, which then wanes in the absence of further disasters. However, if more typhoons occur, the gambler's fallacy heuristic leads to a reduction in insurance purchases. Lin (2020) found that even personal experiences that do not lead to personal losses can affect financial decisions. Using a dataset of homeowners' earthquake insurance policies in California from 2005 to 2013, she provided evidence that minor earthquake shakings, which do not result in economic loss, can cause individuals to perceive a higher risk in the short term and seek protection by purchasing earthquake policies (Lin, 2020).

These findings highlight how personal experiences and cognitive heuristics influence perceived risk and subsequent insurance behaviour. Yet, another critical factor shaping such responses, often interacting with psychological biases, is financial vulnerability. Households with limited economic resilience may be especially sensitive to risk cues and more inclined to seek insurance protection as a buffer against future needs and obligations (Lin & Grace, 2007). Using the Financial Vulnerability Index developed by Lin and Grace (2007), Frees and Sun (2012), documented a higher likelihood of purchasing life insurance policies for more financial vulnerable households. Furthermore, Liebenberg et al. (2012) found that events such as unemployment or new parenthood significantly influence insurance uptake and surrender decisions. In the Kenyan context, Yego et al., (2023) identified poverty vulnerability as one of the strongest predictors of health insurance enrolment. In contrast, Bernheim et al. (2003) documented a persistent mismatch between vulnerability and coverage in the U.S., suggesting that informational, behavioural, or institutional barriers may suppress insurance uptake even when financial exposure is high.

Shifting from general mechanisms to context-specific dynamics, recent studies have examined how the Covid-19 pandemic, as a salient and widespread shock, influenced insurance behaviour at a broader scale. For example, Qian (2021), using aggregated data from 241 Chinese cities, documented a positive and significant association between confirmed Covid-19 cases and insurance revenues, particularly for life and health-related products. Similarly, using city-level insurance purchases data from one online insurance platform in China, Chen et al. (2023) found an increase in the number of insurance purchases after the pandemic. Both latter studies adopted a broad-scale approach, focusing on aggregated data rather than individuals' behavioural patterns. As a result, they could not assess the effect of directly experiencing the extreme event, i.e. contracting the Covid-19, on personal insurance decisions, which is instead the aim of our research.

The existing literature on insurance demand has also highlighted the critical role of socio-demographic characteristics in explaining insurance choices. Age is commonly found to be negatively associated with insurance demand (Bernheim, 1991; Ferber & Lee, 1980; Gandolfi & Miners, 1996). While Gandolfi and Miners (1996) sustain that, as people age, their cumulative probability of living in the future decreases, implying a lower need for insurance protection, Luciano et al. (2016) argue that the decision to acquire a contract should be independent of age if policy premiums are reasonably priced at all stages of life. With respect to income, insurance consumption usually increases with household earnings. This positive relationship occurs because premiums become more affordable as income rises and, in the case of life insurance, because the policy provides protection against the loss of future income resulting from the death of the primary income earner (Browne & Kim, 1993). The evidence on gender is instead mixed. While Luciano et al. (2016)

documented that women are less likely to be insured compared to men, even after controlling for several socioeconomic factors, Turner et al. (2014) found that female participants to their behavioural experiment were significantly more likely to choose insurance. Eling et al. (2021), instead, did not find any significant association between gender and insurance demand. As for education, individuals with a higher attainment tend to have a greater awareness of insurance needs, even though higher knowledge can lead to more risk-loving behaviours (Outreville, 2014). Other factors such as family size, marital status, and employment status can also influence insurance uptake (Bongini et al., 2023; Eling et al., 2021).

As initially argued, the role of an individual's risk aversion profile is widely debated in the insurance literature. Although utility theory predicts a positive relationship between risk aversion and insurance demand, empirical research by Giesbert et al. (2011) and Luciano et al. (2016) documented a negative relation, while Liebenberg et al. (2012) found no significant association. Eling et al. (2021), who investigated this nexus through survey data on 60000 individuals from 14 countries in Europe, showed that risk propensity is positively associated with insurance ownership, especially for life insurance policies, as they are perceived as risky assets.

3. Data and estimation strategy

Our study draws on data from the survey commissioned by the Italian Financial Education Committee and administered by the research institute BVA-Doxa between May and June 2021. The dataset includes responses from 5011 individuals selected through stratified sampling to reflect the national population. Respondents were identified as either the primary decision-makers for their household's finances or the most informed members regarding economic matters. Quotas were applied for gender, age, and geographic distribution, and post-stratification weights were used to ensure representativeness across key socio-demographic indicators such as age, region, education, income, and employment status (Comitato Edufin, 2021).

In our sample, we define an individual as interested in purchasing insurance through the variable *InsuranceInterest*, which is a dichotomous one. This variable is constructed based on individuals' responses to the following survey question: "Since the beginning of the pandemic (March 2020), have you and/or your partner consulted a financial advisor, bank, or other intermediary to evaluate the purchase of insurance policies?". For respondents who selected the option "Yes, to consider purchasing insurance policies" the variable *InsuranceInterest* takes a value of 1, while those who did not select this option were assigned a value of 0.[1] Importantly, this is a retrospective question that covers the entire Covid-19 period since March 2020, thus capturing respondents' behaviour over the whole pandemic. Moreover, the data were collected between May and June 2021, shortly after the Covid-19 peak in November 2020 (Boca et al., 2022), a period in which the salience of Covid-19 was still high. To construct the indicator of direct experience with the extreme event, we first create a variable that captures whether the respondent or a member of his/her household contracted the Covid-19, regardless of its severity. Subsequently, to enhance the granularity of the analysis, additional survey questions were utilized to distinguish the Covid-19 cases by gravity. In particular, respondents were asked whether they or a household member had contracted Covid-19 and, if so, whether they had been hospitalized or admitted to intensive care.[2] This categorization allows us to analyse whether the severity of the risky experience is associated with insurance interest in a differentiated manner.

To investigate the relationship between interest in purchasing insurance and the extreme event of Covid-19 contraction, we estimate a probit regression model. We hypothesize that having been hit by this rare extreme event is positively associated with the propensity to consider insurance. The model takes the following functional form:

$$\text{InsuranceInterest}_i = \beta_0 + \beta_1 X_i + \beta_2 \text{Covid}_i + \varepsilon_i$$

where the subscript i is the individual identifier and ε_i is the error term. X_i is a set of control variables, including gender, age and age squared,[3] levels of education, having children, income quartiles and regional fixed effects. $Covid_i$ captures whether the respondent or another household member contracted the Covid-19.

As mentioned previously, to further explore the role of extremely adverse shocks, we construct additional indicators to distinguish the severity of the risk event, ranging from *ModerateCovid* to *CriticalCovid*, based on respondents' self-reported classification of the seriousness of the event[4]:

$$\text{InsuranceInterest}_i = \beta_0 + \beta_1 X_i + \beta_2 \text{ModerateCovid}_i + \beta_3 \text{SevereCovid}_i + \beta_4 \text{CriticalCovid}_i + \varepsilon_i$$

[1] We acknowledge that this outcome captures an early stage of the decision process (information acquired through consultation with a financial intermediary) rather than observed insurance purchases. While such interest is a necessary precursor to actual uptake, it may not translate into realized demand.

[2] The survey was administered following a fixed and identical sequence for all respondents. The questions on Covid-19 exposure were explicitly introduced "for classification purposes only" and were placed at the end of the questionnaire. This design reduces the likelihood that respondents' answers on Covid-19 exposure were strategically reported to justify previous responses regarding insurance-related consultation. Based on respondents' answers, we constructed three binary variables to capture different levels of Covid-19 severity. *ModerateCovid* identifies the households who contracted the virus, for whom the infection did not require the hospitalization. *SevereCovid* and *CriticalCovid* capture more serious health outcomes, with values of 1 assigned in case of hospitalizations or intensive care due to the infection, respectively. The variable *Covid* equals 1 if the respondent reported one of the three cases discussed above.

[3] Age and Age^2 are included to account for the typical U-shaped life-cycle pattern in insurance demand (Bongini et al., 2023; Luciano et al., 2016).

[4] The exact phrasing of the survey items employed in creating our variables can be found in the Appendix, and the complete questionnaire is accessible (in Italian) at:https://www.comitatoeducazionefinanziaria.gov.it/export/sites/sitopef/modules/quaderni_ricerca/Questionario-Edufin-2021.docx

To enhance the explanatory power of our model, we estimate an extended version that incorporates two additional explanatory variables: *RiskPropensity* and *InsuranceExperience*. In line with the literature, we expect a significant association between willingness to take financial risks and interest in insurance policy (Eling et al., 2021; Luciano et al., 2016). Furthermore, existing studies suggest that having a previous experience with insurance policies raises the likelihood of additional coverage (Robinson et al., 2021). Hence, we estimate the following probit regression model[5]:

$$\text{InsuranceInterest}_i = \beta_0 + \beta_1 X_i + \beta_2 \text{ModerateCovid}_i + \beta_3 \text{SevereCovid}_i + \beta_4 \text{CriticalCovid}_i +$$

$$\beta_5 \text{RiskPropensity}_i + \beta_6 \text{InsuranceExperience}_i + \varepsilon_i$$

where X_i includes the same control variables as the baseline model. *RiskPropensity* is derived from a survey question where respondents rated their financial risk tolerance on a scale from 1 to 10, where 1 indicates complete risk aversion and 10 means high-risk tolerance. We define *RiskPropensity* as a binary variable, assigning a value of 1 to individuals who reported a score greater than the median value of 4 and 0 otherwise.[6] Additionally, we include *InsuranceExperience*, which is a dichotomous variable taking value 1 for individuals who held a life insurance policy before the Covid-19 emergency.[7]

Subsequently, we further refine the model by introducing three additional explanatory variables related to households' portfolio composition: *Homeownership*, *RiskFreeAsset* and *RiskyAsset*. The variables indicating the ownership of the household's primary residence, risk-free or risky assets allow us to explore whether being more familiar with financial markets opportunities is associated with higher interest in purchasing insurance, as suggested by Luciano et al. (2016). We therefore estimate the following model:

$$\text{InsuranceInterest}_i = \beta_0 + \beta_1 X_i + \beta_2 \text{ModerateCovid}_i + \beta_3 \text{SevereCovid}_i + \beta_4 \text{CriticalCovid}_i + \beta_5 \text{RiskPropensity}_i + \beta_6 \text{InsuranceExperience}_i + \beta_7 \text{Homeownership}_i + \beta_8 \text{RiskFreeAsset}_i + \beta_9 \text{RiskyAsset}_i + \varepsilon_i$$

where X_i includes the same control variables of the baseline regression. *Homeownership* is a dummy variable equal to 1 if the respondents own their home, either outright or through a mortgage, and 0 otherwise. *RiskFreeAsset* is a binary variable that takes a value of 1 if respondents reported holding only risk-free assets, like savings accounts or government bonds, while *RiskyAsset* takes a value of 1 if respondents reported holding private bonds, stocks, mutual funds, ETFs, sustainable finance products, pension funds, or cryptocurrencies. In line with the study by Luciano et al. (2016) and Eling et al. (2021), we hypothesize that individuals who are homeowners and hold risky assets are more familiar with investments, either in the form of real estate or financial instruments, may also be more inclined to consider insurance policies.

Finally, we introduce a gender-based analysis to examine whether men and women exhibit different behaviours when considering insurance purchase decisions. This heterogeneity analysis is motivated by existing literature suggesting that risk perception and financial decision-making may vary systematically by gender, potentially influencing insurance demand (Gandolfi & Miners, 1996; Luciano et al., 2016; Outreville, 2014). To formally assess these differences, we estimate the same regression model separately for the male and female subsamples. This analysis allows us to compare how the covariates of insurance purchasing interest operate across gender groups while keeping the model specification unchanged compared to the previous one.

Table 1 reports the descriptive statistics for the socio-demographic characteristics and the variables of interest. Regarding the insurance demand, 8% of respondents reported having consulted a financial intermediary for insurance-related purposes, indicating a willingness to explore insurance policies after the pandemic. In terms of exposure to the extreme event, 18% of respondents reported they or another household member contracted the Covid-19. More specifically, 13% of households experienced mild symptoms without requiring hospitalization, 2% were hospitalized, and 3% also required the intensive care treatment. Women account for 37% of the weighted sample,[8] while the age ranges from 18 to 89, with an average value of about 53.

4. Results

4.1. Baseline results

The results from the first regression models are reported in Table 2. The initial specification in column (1) only includes demographic and socio-economic characteristics as control variables. The relationship between age and interest in insurance policies after the pandemic appears to be non-linear. As expected from prior literature, the coefficient on age is negative and statistically

[5] Notably, in this specification, the general Covid-19 variable is no longer included, as the focus shifts entirely to the role of illness severity in shaping insurance interest.

[6] The precise wording of the question is as follows: "When thinking about your financial decisions, including financial investments, how much risk are you willing to take? Please indicate your answer on a scale from 1 to 10, where 1 means 'not at all risk-tolerant' and 10 means 'very risk-tolerant.'

[7] Respondents were asked about their ownership of various financial products prior to the pandemic.

[8] All descriptive statistics are computed using the survey weights provided in the Edufin dataset. The gender composition therefore reflects the weighted sample of household financial decision-makers (or the household member most knowledgeable about financial matters) in the Italian context. The female population can be underrepresented compared to official statistics, as the role of the person responsible for making financial decisions within the household is traditionally held by men in Italy (Castagno et al., 2025). However, women still represent a sizable share (37%) of the sample, and this should not raise any concern regarding the reliability of the model estimates.

Table 1
Summary Statistics.

	Mean	SD	Min	Max
Interested in insurance	0.08	0.27	0.00	1.00
Affected by Covid-19	0.18	0.39	0.00	1.00
Moderate Covid-19	0.13	0.34	0.00	1.00
Severe Covid-19	0.02	0.15	0.00	1.00
Critical Covid-19	0.03	0.18	0.00	1.00
Female	0.37	0.48	0.00	1.00
Age	52.70	13.57	18.00	89.00
Elementary School or less	0.45	0.50	0.00	1.00
High School	0.37	0.48	0.00	1.00
Degree	0.19	0.39	0.00	1.00
Income, 1st quartile	0.26	0.44	0.00	1.00
Income, 2nd quartile	0.19	0.39	0.00	1.00
Income, 3rd quartile	0.31	0.46	0.00	1.00
Income, 4th quartile	0.24	0.43	0.00	1.00
Having children	0.50	0.50	0.00	1.00
Insurance Experience	0.09	0.28	0.00	1.00
Home Ownership	0.82	0.39	0.00	1.00
Risk Propensity	0.45	0.50	0.00	1.00
Risk Free Asset	0.14	0.35	0.00	1.00
Risky Asset	0.19	0.40	0.00	1.00

Note: The number of observations is 5011 for all the variables. All figures are sample-weighted. To classify respondents based on household income, we divided them into four quartiles according to their self-reported monthly net income. The first quartile includes households earning €1264 or less, while the second quartile consists of those with an income between €1265 and €1549. The third quartile covers households earning between €1550 and €2454, and the fourth quartile includes those with an income above €2455.

significant, indicating that interest tends to decrease with age (Bernheim, 1991; Ferber & Lee, 1980; Gandolfi & Miners, 1996). However, the positive and weakly significant coefficient on age squared suggests that, while insurance interest tends to decline with age, this trend may reverse among the oldest individuals, implying a U-shaped relationship (Bongini et al., 2023). Education, conversely, is positively associated with the probability of seeking insurance, corroborating Outreville's (2014) evidence. The presence of children emerges as a strong correlated factor, consistent with Bongini et al. (2023), confirming that individuals with dependents are more likely to seek insurance as a precautionary financial measure. Building upon this baseline, in column (2), the inclusion of income does not substantially alter the results. Differently from what Browne and Kim (1993) found, the quartile coefficients are not statistically significant, suggesting a marginal role of income when controlling for other socioeconomic factors. In column (3), the coefficient on the direct experience with the Covid-19 is positive and statistically significant at the 1% level, supporting our primary hypothesis that exposure to an extreme event may change individuals' risk perceptions of its likelihood, which in turn leads to a higher interest in an insurance protection solution. More broadly, these results align with the existing literature about how experiencing adverse negative shocks are associated with changes in decision-making and insurance-related behaviour (Gallagher, 2014; Turner et al., 2014; Yin et al., 2016). To refine the analysis further, the fourth specification replaces the general Covid-19 exposure variable with more detailed measures of the risk severity of the event, distinguishing between moderate cases, sever cases involving hospitalizations, and critical cases leading to intensive care admissions. The results reported in column (4) indicate that all three levels of severity are positively associated with higher insurance interest, with the coefficients increasing in magnitude as the gravity of the event rises. Specifically, having contracted Covid-19 in a mild form raises the probability of being interested in insurance by 4 %age points, whereas having been hospitalized or admitted to intensive care increases the likelihood by 8.5 and 11.1 %age points, respectively. Given a sample mean of 8%, having experienced the most severe forms of Covid-19 doubles the share of individuals interested in insurance.

In Table 3, we consider the effect of two additional explanatory variables: *RiskPropensity* and *InsuranceExperience*. In line with the empirical literature (Eling et al., 2021; Luciano et al., 2016), results in column (2) of Table 3 indicate that being more risk tolerant is positively associated with being interested in insurance policies, meaning that those comfortable with financial risk may also perceive insurance as a strategic financial tool. The third column of Table 3 shows a positive and significant coefficient on *InsuranceExperience*, indicating that individuals with previous exposure to insurance products are more likely to consider purchasing additional coverage. Most importantly, the inclusion of these variables related to risk attitudes and past insurance experience leaves the coefficients on the extreme event unchanged. Indeed, we still observe that all three levels of severity of the event are positively associated with higher interest in purchasing insurance, with the coefficient magnitudes increasing with the gravity of the event.

Table 4 reports the estimates that take into account also the familiarity with financial investments, either in the form of real estate or financial instruments (Luciano et al., 2016; Eling at al., 2021; Outreville, 2014). The results in column (1) show a positive, but only marginally significant coefficient on homeownership. In column (2) of Table 4, we included the ownership of risk-free and risky assets. The results show that holding risky assets is positively and significantly associated with the outcome variable, while the risk-free investment does not play any role. These findings are consistent with those of Outreville (2014), Luciano et al. (2016), and Eling et al. (2021), who report a positive association between individuals' familiarity with financial market opportunities and their interest in insurance policies. As in Table 3, the inclusion of these variables leaves the positive relationship between Covid-19 exposure and

Table 2
Multivariate regression model of being interested in insurance policies: the role of the extreme event of Covid-19.

	(1) Interested in insurance	(2) Interested in insurance	(3) Interested in insurance	(4) Interested in insurance
Affected by Covid-19			0.063***	
			(0.011)	
Moderate Covid-19				0.040***
				(0.014)
Severe Covid-19				0.085***
				(0.026)
Critical Covid-19				0.111***
				(0.018)
Female	-0.015	-0.015	-0.017	-0.015
	(0.010)	(0.011)	(0.010)	(0.010)
Age	-0.008***	-0.009***	-0.008***	-0.008***
	(0.003)	(0.003)	(0.003)	(0.003)
Age^2	0.000*	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
High School	0.027**	0.028**	0.029**	0.026**
	(0.013)	(0.013)	(0.013)	(0.013)
Degree	0.041***	0.041***	0.043***	0.039***
	(0.013)	(0.013)	(0.013)	(0.013)
Having children	0.057***	0.057***	0.048***	0.045***
	(0.011)	(0.011)	(0.011)	(0.011)
Income, 2nd quartile		-0.022	-0.021	-0.019
		(0.015)	(0.015)	(0.015)
Income, 3rd quartile		0.005	0.009	0.013
		(0.015)	(0.015)	(0.015)
Income, 4th quartile		-0.004	0.001	0.003
		(0.015)	(0.015)	(0.015)
Observations	5011	5011	5011	5011

Note: Probit average marginal effects, robust standard errors in parentheses. Estimates use sample weights. All specifications include regional fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

insurance interest unchanged, underscoring the robustness of our finding even when accounting for previous financial investments.

Finally, Table 5 shows how the willingness to purchase insurance differs by gender, highlighting distinct behaviours between men and women. While column (1) of Table 5 reports the estimates for the full sample, in columns (2) and (3) several differences emerge between the female and male subsamples. Higher education is a stronger predictor of the outcome variable in the female subsample, showing a significant positive correlation, suggesting that higher educational attainments may play a more central role in shaping their insurance decisions. The presence of children again correlates with higher interest in purchasing insurance for both genders, corroborating the hypothesis that caregiving responsibilities increase the perceived need for insurance protection (Bongini et al., 2023). Notably, the severity of the Covid-19 experience correlates with the interest in taking out insurance differently. Specifically, while the female subsample shows statistically significant coefficients on all the Covid-19 categories, for men only the one on the highest severity level is statistically significant. For both groups, the economic magnitude of the coefficients is comparable to that of the baseline results, with interest in insurance rising by between 5.4 and 11.2 %age points, doubling in some cases the sample mean (8%). This suggests that women may be more responsive to shocks in terms of precautionary financial behaviour, aligning with previous literature indicating that women are more likely to be susceptible to the availability heuristic (Yin et al., 2016), i.e., decision-making is conditioned from past recent experiences (Tversky and Kahneman, 1982).[9]

4.2. Robustness tests

To further assess the robustness of our baseline findings and to address potential alternative mechanisms that can explain interest in insurance policies, we conduct additional heterogeneity analyses along two key dimensions: occupational status and perceived financial vulnerability. These dimensions are particularly relevant in the context of the Covid-19 pandemic, as they may capture differences in income stability, exposure to economic shocks, and financial resilience.

We first investigate whether the association between Covid-19 exposure and insurance interest varies across occupational groups. Using a survey question which records respondents' main employment status, we classify individuals into four mutually exclusive categories: self-employed, employed, retired, and not working. This classification distinguishes between groups that differ in terms of income volatility, job security, and exposure to pandemic-related economic disruptions. For each occupational group, we re-estimate the baseline probit specification separately, maintaining the same set of control variables used in the main analysis. The results

[9] We also conducted an additional analysis controlling for caregiving responsibilities, where, in addition to the existing control for having children, we introduced a dummy equal to one if respondents reported the presence of individuals aged 70 or above in their household, capturing potential elderly-care responsibilities. The main results remain unchanged.

Table 3
Multivariate regression model of being interested in insurance policies: the role of behavioural and experiential factors.

	(1) Interested in insurance	(2) Interested in insurance	(3) Interested in insurance
Moderate Covid-19	0.040***	0.036***	0.036***
	(0.014)	(0.013)	(0.013)
Severe Covid-19	0.085***	0.074***	0.069***
	(0.026)	(0.026)	(0.026)
Critical Covid-19	0.111***	0.092***	0.086***
	(0.018)	(0.018)	(0.018)
Female	-0.015	-0.009	-0.008
	(0.010)	(0.010)	(0.010)
Age	-0.008***	-0.006**	-0.007**
	(0.003)	(0.003)	(0.003)
Age^2	0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)
High School	0.026**	0.026**	0.026**
	(0.013)	(0.013)	(0.013)
Degree	0.039***	0.036***	0.036***
	(0.013)	(0.013)	(0.013)
Having children	0.045***	0.040***	0.040***
	(0.011)	(0.011)	(0.011)
Income, 2nd quartile	-0.019	-0.017	-0.018
	(0.015)	(0.015)	(0.015)
Income, 3rd quartile	0.013	0.011	0.009
	(0.015)	(0.015)	(0.015)
Income, 4th quartile	0.003	-0.003	-0.006
	(0.015)	(0.015)	(0.015)
Risk Propensity		0.051***	0.050***
		(0.011)	(0.011)
Insurance Experience			0.060***
			(0.016)
Observations	5011	5011	5011

Note: Probit average marginal effects, robust standard errors in parentheses. Estimates use sample weights. All specifications include regional fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

reported in Table 6 confirm that the positive association between direct exposure to Covid-19 and insurance interest emerges across all occupational categories, particularly for more severe experiences of the event. Although the magnitude of the coefficients varies across groups, and for some occupational categories a portion of observations is dropped due to no within-category variation in the dependent variable when including regional fixed effects, the general pattern is consistent with the baseline results. This evidence suggests that the main findings are not driven by heterogeneity across occupational groups.

Furthermore, we explore heterogeneity by perceived financial vulnerability, which may capture individuals' ability to absorb economic shocks and cope with unexpected expenses (Lin & Grace, 2007). Financial vulnerability is constructed by combining two survey questions capturing complementary dimensions of economic fragility. The first question reflects respondents' ability to cope with unexpected expenses and equals one for individuals reporting that they would certainly or probably not be able to raise a fixed amount of money in the event of an unexpected financial emergency. The second one captures financial anxiety and equals one for respondents reporting high levels of financial worry. Following a conservative approach, individuals are classified as financially fragile if at least one of these two conditions is satisfied, while the remaining respondents are classified as non-financially fragile. We then split the sample accordingly and re-estimate the main regression separately for the two groups. As in the occupational analysis, all specifications include the same set of controls as the baseline model. The corresponding results are presented in Table 7. Again, we observe that the association between Covid-19 exposure and the dependent variable is positive and statistically significant for both groups. Hence, differences among vulnerable individuals do not rule out the proposed behavioural heuristic conjecture.

5. Conclusions

The literature on insurance demand documents that being exposed to natural disasters and suffering their consequences exerts an influence on individuals' insurance underwriting behaviour (Kunreuther & Pauly, 2018; Lin, 2020; Yin et al., 2016). In this study, we contribute to this strand of the literature investigating whether experiencing a rare extreme event like the Covid-19 is associated with a higher propensity to consider insurance protection. To do so, we analyse survey data collected in 2021 from a representative sample of Italian households and exploit different event severity levels. We find a positive and significant association between having directly experienced the extreme event and interest in taking out insurance policies. Strikingly, the magnitude of this association depends on the intensity of the event experienced by individuals and their households: those who were affected by severe and critical Covid-19 showed higher interest in purchasing insurance. These results are robust to several specifications, i.e., they do not change even after controlling for risk propensity, previous insurance experience, and different types of households' financial investments. A possible explanation is that individuals hit by such a shock develop a greater awareness of risky events and insurance needs. Moreover,

Table 4
Multivariate regression model of being interested in insurance policies: the role of financial investments.

	(1) Interested in insurance	(2) Interested in insurance
Moderate Covid-19	0.036***	0.033**
	(0.013)	(0.013)
Severe Covid-19	0.068***	0.065***
	(0.025)	(0.025)
Critical Covid-19	0.084***	0.077***
	(0.018)	(0.019)
Female	-0.008	-0.007
	(0.010)	(0.010)
Age	-0.007**	-0.007**
	(0.003)	(0.003)
Age^2	0.000*	0.000
	(0.000)	(0.000)
High School	0.026**	0.025**
	(0.013)	(0.013)
Degree	0.036***	0.035***
	(0.013)	(0.013)
Having children	0.039***	0.039***
	(0.011)	(0.011)
Income, 2nd quartile	-0.020	-0.019
	(0.015)	(0.015)
Income, 3rd quartile	0.005	0.007
	(0.015)	(0.015)
Income, 4th quartile	-0.011	-0.009
	(0.015)	(0.015)
Risk Propensity	0.049***	0.047***
	(0.011)	(0.011)
Insurance Experience	0.060***	0.044**
	(0.016)	(0.017)
Home Ownership	0.024*	0.023*
	(0.014)	(0.014)
Risky Asset		0.027**
		(0.012)
Risk Free Asset		-0.001
		(0.015)
Observations	5011	5011

Note: Probit average marginal effects, robust standard errors in parentheses. Estimates use sample weights. All specifications include regional fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

a separate analysis by gender highlights a heterogeneity in the reaction to the event, with men being more interested in insurance policies only when they experienced the most severe scenario. Finally, heterogeneity by occupational status and perceived financial vulnerability does not explain the proposed behavioural heuristic mechanism.

Being able to capture potential insurance interest that arises in the heat of the moment, when a risky event occurs, is crucial both for the population seeking better protection and the insurance companies looking to meet this potential demand. On average, only a small portion of the population is insured (IVASS, 2024), however, our estimates showed that individuals' awareness and willingness to consider purchasing insurance policies are significantly associated with direct exposure to risky events, not only natural catastrophes, and increase with the severity of the occurrence itself. While prevention is undoubtedly preferable, the saying "better late than never" also holds true. For this reason, insurance companies should be ready to responsibly take action when major risky events occur, to launch broad information and awareness campaigns, supported by a transparent sales strategy.

Financial intermediaries and policymakers could strategically exploit and anticipate increases in insurance interest that could translate in greater insurance demand, in times of uncertainty or when adverse events occur. Our findings underscore the increasing attention that insurance companies receive from the market, as providers of protection during periods of heightened uncertainty. This perspective has critical implications in a world facing increasingly frequent systemic risks, such as pandemics and climate change, where anticipating behavioural shifts can help shape more effective public and private strategies. From a policy standpoint, the heterogeneity we observe, especially across gender and individual profiles, suggests the value of tailoring insurance solutions to diverse segments of the population. Public institutions and market actors alike can benefit from integrating behavioural insights to promote more effective and responsive insurance models.

We acknowledge that this analysis has certain limitations that future research could address. A primary limitation concerns the

Table 5
Multivariate regression model of being interested in insurance policies: the role of gender.

	(1) Full sample Interested in insurance	(2) Men Interested in insurance	(3) Women Interested in insurance
Moderate Covid-19	0.033**	0.015	0.054***
	(0.013)	(0.017)	(0.020)
Severe Covid-19	0.065***	0.033	0.112***
	(0.025)	(0.036)	(0.034)
Critical Covid-19	0.077***	0.088***	0.056**
	(0.019)	(0.025)	(0.026)
Female	-0.007		
	(0.010)		
Age	-0.007**	-0.007*	-0.007*
	(0.003)	(0.004)	(0.004)
Age^2	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
High School	0.025**	0.018	0.048**
	(0.013)	(0.015)	(0.022)
Degree	0.035***	0.017	0.068***
	(0.013)	(0.016)	(0.020)
Having children	0.039***	0.031**	0.051***
	(0.011)	(0.014)	(0.015)
Income, 2nd quartile	-0.019	-0.038*	-0.003
	(0.015)	(0.020)	(0.020)
Income, 3rd quartile	0.007	-0.002	0.014
	(0.015)	(0.018)	(0.020)
Income, 4th quartile	-0.009	-0.003	-0.030
	(0.015)	(0.019)	(0.020)
Risk Propensity	0.047***	0.034**	0.057***
	(0.011)	(0.014)	(0.014)
Insurance Experience	0.044**	0.037*	0.045*
	(0.017)	(0.021)	(0.027)
Home Ownership	0.023*	0.027	0.016
	(0.014)	(0.019)	(0.018)
Risky Asset	0.027**	0.028*	0.021
	(0.012)	(0.015)	(0.017)
Risk Free Asset	-0.001	-0.010	0.018
	(0.015)	(0.018)	(0.021)
Observations	5011	3094	1904

Note: Probit average marginal effects, robust standard errors in parentheses. All specifications include regional fixed effects. In the female subsample, 13 observations are dropped due to no within-category variation in the dependent variable when including regional fixed effects. Estimates use sample weights. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

survey-based methodology employed to collect data. As with all survey-based analyses, our study may be subject to measurement error and reporting biases (Isaia et al., 2024). Self-reported information can be affected by recall issues or subjective interpretation. However, we argue that the measure for our key variable of interest (i.e., having contracted Covid-19) is unlikely to be affected by recall problems, given the unprecedented scale of the pandemic. Therefore, while potential biases may relate to other self-reported variables, we believe that the main mechanism we test and the corresponding results are not affected by these concerns. Furthermore, our dependent variable captures self-reported consultation with a financial intermediary to evaluate the purchase of insurance policies, and therefore reflects stated interest (a pre-purchase stage) rather than insurance purchases. Such intentions may not always translate into actual behaviour due to constraints such as affordability, underwriting frictions, or inertia. Moreover, we evaluate the effect of Covid-19 on insurance interest in the short term because of data availability. However, it would be interesting to investigate whether this effect persists in the long term or whether the interest in purchasing insurance eventually converges back to its initial level, as observed by Yin et al. (2016) and Lin (2020) in the context of insurance for natural disasters.[10] Finally, we used Covid-19 as a case study to explore the general link between adverse events and insurance interest. However, future research could extend the methodological approach applied in our study to assess the impact of other emerging critical events, such as those related to climate change, currently at the centre of international debate.

CRediT authorship contribution statement

Noemi Oggero: Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Eleonora Isaia:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Conceptualization.

[10] It should be noted that we could not verify the long term effect, as subsequent surveys no longer included the question regarding the interest in insurance policies following the pandemic.

Table 6
Multivariate regression model of being interested in insurance policies: the role of occupational status.

	(1) Self employed	(2) Employed	(3) Retired	(4) Not working
Moderate Covid-19	0.098**	0.043**	-	0.006
	(0.038)	(0.018)	-	(0.016)
Severe Covid-19	0.179**	0.049	-	0.088***
	(0.072)	(0.033)	-	(0.029)
Critical Covid-19	0.111*	0.083***	0.145**	0.075***
	(0.060)	(0.024)	(0.069)	(0.024)
Female	0.008	-0.018	-0.001	0.019
	(0.027)	(0.015)	(0.024)	(0.015)
Age	-0.011	-0.005	-0.023	0.004
	(0.007)	(0.005)	(0.019)	(0.003)
Age^2	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
High School	0.033	0.026	0.006	0.027*
	(0.040)	(0.018)	(0.023)	(0.015)
Degree	0.082**	0.028	-0.002	0.036
	(0.034)	(0.018)	(0.025)	(0.027)
Having children	0.041*	0.041***	0.052**	0.013
	(0.024)	(0.015)	(0.022)	(0.016)
Income, 2nd quartile	0.044	-0.063***	0.449***	0.038
	(0.034)	(0.022)	(0.149)	(0.026)
Income, 3rd quartile	-0.006	-0.008	0.434***	0.033*
	(0.033)	(0.022)	(0.139)	(0.017)
Income, 4th quartile	0.008	-0.063***	0.488***	0.032*
	(0.033)	(0.022)	(0.142)	(0.019)
Risk Propensity	0.024	0.067***	0.005	0.038**
	(0.025)	(0.015)	(0.018)	(0.016)
Insurance Experience	-0.034	0.046*	0.076***	0.064***
	(0.045)	(0.025)	(0.025)	(0.025)
Home Ownership	0.089**	0.018	0.034	0.019
	(0.036)	(0.020)	(0.031)	(0.018)
Risky Asset	-0.025	0.047***	0.001	0.044**
	(0.034)	(0.018)	(0.019)	(0.022)
Risk Free Asset	0.044	0.000	-0.006	-0.047*
	(0.035)	(0.021)	(0.024)	(0.025)
Observations	682	3363	404	280

Note: Probit average marginal effects, robust standard errors in parentheses. All specifications include regional fixed effects. In the Employed, Retired and Not working subsamples, 28, 182 and 72 observations, respectively, are dropped due to no within-category variation in the dependent variable when including regional fixed effects. Estimates use sample weights. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7
Multivariate regression model of being interested in insurance policies: the role of perceived financial vulnerability.

	(1) Non financially fragile	(2) Financially fragile
Moderate Covid-19	0.043**	0.016
	(0.017)	(0.016)
Severe Covid-19	0.009	0.103***
	(0.035)	(0.034)
Critical Covid-19	0.088***	0.067***
	(0.026)	(0.025)
Female	-0.005	-0.009
	(0.014)	(0.014)
Age	-0.005	-0.005
	(0.003)	(0.004)
Age^2	0.000	0.000
	(0.000)	(0.000)
High School	-0.004	0.059***
	(0.017)	(0.017)
Degree	0.014	0.062***
	(0.017)	(0.017)
Having children	0.041***	0.032**
	(0.014)	(0.015)
Income, 2nd quartile	-0.067***	0.009
	(0.024)	(0.018)
Income, 3rd quartile	0.000	-0.000
	(0.021)	(0.017)
Income, 4th quartile	-0.015	-0.013
	(0.021)	(0.019)
Risk Propensity	0.054***	0.034**
	(0.015)	(0.014)
Insurance Experience	0.034	0.062***
	(0.023)	(0.024)
Home Ownership	0.012	0.026
	(0.021)	(0.016)
Risky Asset	0.012	0.049***
	(0.017)	(0.017)
Risk Free Asset	0.010	-0.020
	(0.020)	(0.021)
Observations	2775	2188

Note: Probit average marginal effects, robust standard errors in parentheses. All specifications include regional fixed effects. In the financially fragile and non-fragile subsamples, 27 and 21 observations, respectively, are dropped due to no within-category variation in the dependent variable when including regional fixed effects. Estimates use sample weights. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Chiara Pellegrino: Writing – review & editing, Formal analysis. **Davide Sandretto:** Writing – review & editing, Methodology, Formal analysis, Conceptualization.

Declaration of Competing Interest

None.

Appendix - Questionnaire

Interested in insurance

Q.57 Since the beginning of the pandemic (March 2020), have you and/or your partner consulted a financial advisor, bank, or other intermediary? [multiple answers allowed]

- Yes, to obtain financing
- Yes, to consider investments
- Yes, to evaluate the purchase of insurance policies
- Yes, to evaluate the purchase of pension funds
- Yes, for other reasons
- No, we did not consult a financial advisor, bank, or other intermediary

Covid-19

Q.61 Finally, just for classification purposes, we ask you if anyone in your household…

- has contracted the Covid-19? Yes, I personally | other person | no one

- (if yes) have he/she been hospitalised for Covid-19? Yes, I personally | other person | no one
- (if yes) have he/she been in intensive care for Covid-19? Yes, I personally | other person | no one

Risk propensity

Q.29 When thinking about your financial decisions, including financial investments, how much risk are you willing to take? (Please indicate your answer on a scale from 1 to 10, where 1 means 'not at all risk-tolerant' and 10 means 'very risk-tolerant').

Insurance experience – Risky assets – Risk-free assets

Q.24 Which of these financial/pension/insurance instruments did you own before the Covid-19 emergency?

1) Savings accounts
2) Government bonds
3) Private bonds
4) Capital shares or equities
5) Sustainable finance products
6) Mutual funds
7) ETFs (Exchange Traded Funds)
8) Life insurance policies
9) Pension funds
10) Cryptocurrencies

Home Ownership

Q.4 The dwelling where you live is:

a) Owned with a mortgage
b) Fully owned
c) Rented
d) Other (right of use, etc.)

Occupational status

Q.7 Are you self-employed or employed? a) Self-employed b) Public-sector employee, permanent contract c) Public-sector employee, temporary contract d) Private-sector employee, permanent contract e) Private-sector employee, temporary contract f) Not applicable – retired g) Not applicable – unemployed h) Other

For the heterogeneity analysis, occupational status is grouped into four categories: self-employed (a), employed (b–e), retired (f), and not working (g–h).

Financial vulnerability

Q.16 How confident are you that you could come up with €2000 if an unexpected need arose within the next month?

a) I am certain I could come up with €2000
b) I could probably come up with €2000
c) I could probably not come up with €2000
d) I am certain I could not come up with €2000 e) I do not know

For the heterogeneity analysis, financial vulnerability is constructed as a dichotomous variable equal to one if respondents reported that they would certainly or probably not be able to raise €2000 within one month in case of an emergency, and zero otherwise.

Financial anxiety

Q.22.2 To what extent do you agree or disagree with the following statement? (Please indicate your answer on a scale from 1 to 5, where 1 = "strongly disagree", 3 = "neither agree nor disagree", and 5 = "strongly agree".) "I am afraid that I will not be able to provide a secure and stable future for myself and my family."

For the heterogeneity analysis, financial anxiety is constructed as a dichotomous variable equal to one if respondents reported high levels of financial worry, corresponding to responses 4 or 5 on the agreement scale, and zero otherwise.

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