Hedging by Giving: Spiritual Insurance and Religious Donations

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Abstract

We investigate "spiritual insurance"—a mental strategy for coping with risk, where individuals engage in good deeds, including donations, in exchange for perceived blessings and protection. Using bank transactional data, we show that higher income uncertainty and health shocks lead to increased donations, particularly to religious charities. Moreover, individuals who donate to religious charities reduce insurance expenditures. In a field experiment on millions of potential donors through an online donation platform, we find that spiritual insurance narratives indeed increase giving, providing direct causal evidence for such a motive. Our findings provide new evidence on how spiritual insurance affects household risk-coping behavior.

Keywords: spiritual insurance, behavioral household finance, income uncertainty
JEL Classification: D14, D81, G22

Whoever is kind to the poor lends to the LORD, and will be repaid in full.

—(New International Version, Proverbs 19:17)

1. Introduction

Uncertainty plays a pivotal role in economic and finance research. Traditionally, individuals manage risk through material means such as savings, diversification, and insurance. However, beyond these conventional strategies, people may also employ psychological or religious mechanisms to cope with uncertainty. For example, ancient sailors sought divine protection from deities like Poseidon, reflecting a belief in spiritual interventions, while modern U.S. megachurches encourage donations to secure blessings and avert misfortune. This concept of *spiritual insurance*—the belief that good deeds such as donations can be rewarded by blessings and protection against future risk from a supernatural entity—serves as a possible psychological hedge against risk that affects household finance decisions. In this paper, we propose the first integrated approach combining large-scale bank transaction data and a field experiment to identify spiritual insurance and its implications for household finance behavior.

Past research has explored how religious beliefs shape financial behaviors, such as stock market participation (Hong, Kubik, and Stein, 2004), investment choices (Kumar, 2009), and corporate decisions (Hilary and Hui, 2009). Additionally, people also study how auspisious beliefs affect financial decisions (e.g., Hirshleifer, Jian, and Zhang, 2018; Bhattacharya, Kuo, Lin, and Zhao, 2018). Although recent studies show that formal insurance may crowd out local religious contributions (Auriol, Lassebie, Panin, Raiber, and Seabright, 2020; Cronqvist, Warachka, and Yu, 2023), it remains challenging to provide identifying evidence separating spiritual insurance from local mutual insurance mechanisms in these settings. Consequently, the existence of spiritual insurance and its implications on household finance behavior have not been adequately examined in the literature.

In this paper, we test the predictions of spiritual insurance using a unique transaction-level dataset covering income, donations, and insurance purchases for over 70,000 individuals from a bank in Taiwan. Using within-person variations, we find that uncertainty and health shocks lead to increased donations—particularly to religious charities—and that these religious donations substitute for insurance purchases. These patterns align with the predictions of the spiritual insurance channel and provide the first archival data evidence of its existence. Furthermore, we analyze a field experiment conducted by a large online donation platform involving approximately 4 millions donors and show that spiritual insurance narratives significantly increase donations, providing novel causal evidence on how spiritual insurance can shape real behavior at a large scale. Taken together, our study contributes to the literature by offering causal evidence on the existence of spiritual insurance through the field experiment and analyzing its role in shaping household decision-making, particularly the relationship between income uncertainty, insurance purchases, and charitable donations through the bank transaction data.

More specifically, we first outline a stylized model of donation and insurance behaviors with

or without spiritual insurance to derive testable predictions. In this model, if donations do not have a spiritual insurance interpretation, income uncertainty reduces the level of donations through an income effect. However, a strong enough mentality of spiritual insurance predicts a positive effect of income uncertainty on the level of donations. The model also predicts that donations and insurance are substitutes, where increases in religious donations correspond with decreased demand for conventional insurance products. This relationship between income uncertainty, donation, and insurance behavior provides a key test of the spiritual insurance hypothesis.

We test the model predictions using a unique transaction-level dataset from a major bank in Taiwan, covering income, donations, and insurance purchases for over 70,000 individuals between July 2013 and June 2015. These individuals have their paychecks directly deposited into accounts at the bank and spend regularly using the bank's credit card, with observed donations made to non-local charities that are either religious or secular. Our dataset provides a unique laboratory to study spiritual insurance. The inclusion of religious and non-religious donations, with religious donations made to non-local charities, ensures that informal mutual insurance at the community level is unlikely. Additionally, the inclusion of insurance data enables us to examine the potential substitutability between charitable giving and conventional forms of risk management. Notably, most religious donations in the dataset are directed to evangelical charities, indicating that our results may hold relevance for other regions where such groups are present.

We test the model predictions using a unique transaction-level dataset on donations and income from a commercial bank in Taiwan, covering income, donations, and insurance purchases for over 70,000 individuals between July 2013 and June 2015. These individuals have their paychecks directly deposited into accounts at the Bank and spend regularly using the Bank's credit card, with observed donations made to non-local charities that are either religious or secular. With religious donations made to non-local charities, our data ensure that informal mutual insurance at the community level is unlikely.

We have three major findings from the Bank transaction data. First, we find that within the same individual, a higher standard deviation of unanticipated income shocks, a common proxy variable for background risk (Heaton and Lucas, 2000; Angerer and Lam, 2009; Betermier, Jansson, Parlour, and Walden, 2012), predicts increased donations. Specifically, a one standard deviation increase in income uncertainty leads to an increase in donations that is 0.37 times the unconditional sample mean, a result statistically significant at the 1% level. To mitigate measurement errors and isolate income uncertainty external to the employee, we employ the variation over time in the firm-level average income uncertainty, calculated by excluding each individual employee's data (leave-one-out), as an instrument for individual-level income uncertainty. The instrumental variable approach confirms the positive predictive effect of income uncertainty on donations.

Second, consistent with the channel of spiritual insurance, we find that the predictive effect of income uncertainty on donations is more pronounced for religious donations and negative uncertainty, and such a relationship also exists for other adverse shocks such as health shock. We

divide donations into religious and secular according to their destinations and analyze the effect of income uncertainty on each. Our analysis reveals that the predictive effect of income uncertainty on donations is 52% stronger for religious donations than for secular ones.[1] Additionally, using a semi-variance approach to separate income uncertainty into positive (upside) and negative (downside) components, we find that the increase in donations is particularly driven by negative income uncertainty predicting religious donations. This effect remains consistently significant across both the baseline and instrumental variable specifications. We also investigate the effect of health shocks on donation behavior, another adverse event that possibly increases background risk. We find that individuals tend to increase religious donations following health shocks. Health shocks, defined as incurring medical expenses above the median in the preceding quarter, lead to an increase in donations that is 1.46 times the unconditional sample mean, primarily driven by donations to religious charities. These findings further support the spiritual insurance hypothesis.

Third, we find that conditional on donating, people spend less on insurance, and their insurance spending is no longer related to background risks. Within-person variations show that donating to religious charities at least once in a given quarter associates with a 33% decrease in insurance purchases during the same period, with each dollar of religious donation linked to a $6.4 reduction in insurance spending, a novel finding. Moreover, while a one standard deviation increase in income uncertainty typically results in an $88 rise in insurance expenditures, this effect is fully mitigated when an employee contributes to religious charities in a given quarter. We find the same patterns even for individuals unlikely to be financially constrained.

Interestingly, we find no evidence that donations materially reduce future income uncertainty, suggesting that spiritual insurance may reflect wishful thinking that does not translate into tangible outcomes. However, we cannot exclude the psychological comfort that such behaviors may provide.

To provide more direct causal evidence on the channel of spiritual insurance in the field at a large scale, we directly examine the effect of spiritual insurance narratives by analyzing a field experiment conducted by one of the world's largest charity crowdfunding platforms in mainland China. This experiment, running from July 28 to August 15, 2022 and involving approximately 4 million potential donors, randomly assigned them to a treatment group, who encountered a "do good deeds and receive blessings" message underneath the donation button. This subtle intervention was designed to heighten the salience of the spiritual insurance narrative. We find two results, both aligning with predictions of the spiritual insurance hypothesis. First, the presence of the message led to a statistically significant increase in donations. Second, intriguingly, regional variations in responsiveness to the spiritual insurance narrative were observed, correlating with the prevalence of beliefs in fate across different areas.

These experimental results from our second set of exercise suggest a tangible impact of spiri-

[1] Supporting this disparity between religious and secular donations, we find in the census data from Taiwan that 58% of the donors who gave to religious recipients cited "seeking blessings" as their motivation, compared to 22% for secular donations. The particular census we analyze was the Survey on Social Development Trends conducted by the Directorate-General of Budget, Accounting and Statistics, publicly available at https://srda.sinica.edu.tw/browsingbydatatype_result.php?category=surveymethod&type=4&csid=47. The predominantly evangelical nature of the religious charities receiving donations in our dataset further reinforces this interpretation.

tual insurance narratives. The consistency of the results across contexts with spiritual insurance predictions lends some credence to the external validity of our study's findings. The integrated results from the observational data exercises and the field experiment exercises are jointly consistent with the existence of spiritual insurance in influencing mental hedging, charitable giving under risk, and insurance decisions.

Our study is related to several lines of research. First, we build upon the growing body of research examining the intersection between religion and finance. For instance, Hong, Kubik, and Stein (2004) demonstrate that individuals who attend church more frequently are more likely to participate in the stock market, suggesting that social networks formed through church attendance can lower information costs. Other studies have documented that religious norms, shaped by doctrines that discourage gambling, reduce corporate investment (Hilary and Hui, 2009) and retail investment in lottery-like stocks (Kumar, 2009). While past research views the effect of religion primarily through the lens of social networks and social norms, our research broadens the scope by investigating the role of religion as a form of spiritual insurance—conceptualized as an individualistic exchange with a higher power—in influencing risk-coping behaviors. In doing so, we advance the religion-finance framework.

Within the religion-finance framework, there is also an emerging literature concerning religion and insurance. Economic studies have provided empirical evidence that donations to local churches (Dehejia, DeLeire, and Luttmer, 2007) and attendance at religious congregations (Chen, 2010) help smooth consumption shocks through mutual insurance mechanisms. Using an experiment with approximately one thousand Pentecostals in Ghana, Auriol, Lassebie, Panin, Raiber, and Seabright (2020) show that free funeral insurance crowded out religious donations. Similarly, Cronqvist, Warachka, and Yu (2023) find that increased usage of crop insurance reduces participation in local churches in the U.S. However, it remains challenging to provide identifying evidence separating spiritual insurance from local mutual insurance mechanisms in these settings. Therefore field evidence for spiritual insurance remains scarce. Our study specifically focuses on spiritual insurance, a longstanding hypothesis that has been challenging to identify. Employing an integrated approach, our field experiment provides direct causal evidence on the existence of spiritual insurance by using spiritual insurance narratives. Using bank transaction data, we also analyze the implications of spiritual insurance on the interaction of income uncertainty, health shock, insurance purchase and charitable donations for the first time. Notably, our data exclude contributions to local religious congregations and markedly differ from mutual insurance settings, allowing us to overcome challenges faced in prior literature.

Third, our study is broadly related to the literature on individual behavior under uncertainty. Existing research has shown that individuals may respond to uncertainty through various mechanisms, including reducing risk exposure in financial markets (e.g., Guiso, Jappelli, and Terlizzese, 1996, Heaton and Lucas, 2000, Betermier, Jansson, Parlour, and Walden, 2012,Choi and Robertson, 2020,d'Astous and Shore, 2024), engaging in informal community risk-sharing (e.g. Townsend, 1994), participating in formal insurance markets (e.g., Guiso and Jappelli, 1998, Koi-

jen, Van Nieuwerburgh, and Yogo, 2016).[2] We contribute to this literature by providing large-scale transaction-level observations and field experimental evidence on spiritual insurance as a new psychological mechanism for dealing with risk.[3]

The rest of the paper is organized as follows. In Section 2, we present a model and derive testable implications on the relationship between income uncertainty, donations, and insurance purchases, with or without a spiritual insurance motive. Section 3 first introduces the dataset on donations, insurance purchases, and income based on banking transactions, and explains the construction of the income uncertainty measure. We then describe the empirical specification and report estimates on how within-person variations in income uncertainty predict donations, and present further tests of the spiritual insurance motive focusing on religious donations and insurance purchases. Section 4 details our field experiment on spiritual insurance narratives. Section 5 concludes.

2. Model

To derive the testable predictions, we first analyze a stylized model about the relationship between income uncertainty, donations, and insurance purchases. The model incorporates both a non-insurance motive, where donation generates direct utility, and a spiritual insurance motive, where donation shifts the perceived probability of the income uncertainty states. The assumption here is not that individuals necessarily believe they can alter objective probabilities; rather, they behave as if their personal involvement—here, their donations—can influence the outcome of uncertain events. Our baseline model is a simple one with one dimension of risk—income uncertainty—and only donations. We later extend the model to account for two dimensions of risk—medical expense uncertainty in addition to income uncertainty—and the option to purchase insurance products.[4]

The agent is endowed with uncertain income $\tilde{I}$. The income realization differs across the three states: $\bar{I}-D$ (bad state) and $\bar{I}+D$ (good state), each with probability p, as well as $\bar{I}$ (neutral state) with probability $1-2p$. Before knowing the realization of $\tilde{I}$, the agent decides to give g as a donation, which generates direct utility. The agent's utility function is $E(u(\tilde{I}-g))+\theta v(g)$. The utility function has standard properties: Both $u(\cdot)$ and $v(\cdot)$ are assumed to be increasing and

[2] There are studies documenting the effects of auspicious beliefs on behavior under uncertainty. For instance, Hirshleifer, Jian, and Zhang (2018) and Bhattacharya, Kuo, Lin, and Zhao (2018) show that people aligned investments with auspicious omens, such as lucky numbers. He, Liu, Sing, Song, and Wong (2020) demonstrate that fewer housing transactions occur on inauspicious days, and buyers pay more for properties with lucky numbers. Fisman, Huang, Ning, Pan, Qiu, and Wang (2023) report that firms reduce investment in R&D and corporate acquisitions in the chairman's zodiac year, traditionally considered inauspicious.

[3] We also contribute to the rich literature on the motives of donations (for a comprehensive review, see Andreoni and Payne, 2013). The literature has provided evidence that donations are affected by tax considerations (e.g., Auten, Sieg, and Clotfelter, 2002), pure altruism, such as public goods provision (e.g., Becker, 1974), impure altruism, such as warm-glow (e.g., Andreoni, 1989), inequality aversion (e.g., Fehr and Schmidt, 1999), reciprocity (e.g., Falk, 2007), and social image and pressure (e.g., DellaVigna, List, and Malmendier, 2012). Our paper contributes to this important literature by providing evidence for a new motive, spiritual insurance. While this literature generally predicts that donation should be negatively associated with income uncertainty, our new motive predicts the opposite pattern that has been documented with the data.

[4] The model extends the framework in Auriol, Lassebie, Panin, Raiber, and Seabright (2020), who examine the effects of one-sided expense risks (e.g., funeral costs). We build on this by introducing two-sided income risk and further explore multi-dimensional uncertainty with medical expense risk.

strictly concave, and $u(\cdot)$ exhibits positive prudence, i.e. $u'''(\cdot) > 0$.[5]

Below, we consider the model relationship of optimal donation choice with income and income uncertainty, first in the model without a spiritual insurance motive, then in the model with such a motive. We compare predictions of the two models to clarify the testable implication of the spiritual insurance motive on donation behavior. If we do not consider the spiritual insurance motive, it is straightforward to see that the following lemma holds.

Lemma 1 *In the model without the spiritual insurance motive, optimal donation size g^* decreases in background risk D.*

Incorporating a spiritual insurance motive into our model significantly alters the prediction of Lemma 1, which we elaborate upon below. With a spiritual insurance motive, the agent's optimization problem now becomes:

$$\max_g (1-2\bar{p})u(\bar{I}-g) + (\bar{p}-\pi(g))u(\bar{I}-g-D) + (\bar{p}+\pi(g))u(\bar{I}-g+D) + \theta v(g) \tag{1}$$

Here, the spiritual insurance motivation is captured by the function $\pi(g)$, which represents how the agent's donation g shifts the perceived probabilities of different income states. Specifically, $\pi(g)$ reflects the belief that donating can alter the likelihood of income shocks: a larger donation reduces the probability of the negative shock $\bar{I}-D$ and increases the probability of the positive shock $\bar{I}+D$. This belief is central to the spiritual insurance motive, where the agent perceives that their charitable actions (i.e., donations) can influence uncertain outcomes in their favor. The term $\theta v(g)$ represents the direct utility derived from donating, independent of its spiritual insurance effect. Solving the first-order conditions of the agent's optimization problem with a spiritual insurance motive and performing comparative static analysis, we obtain that the relationship between optimal donation and background risk D could be positive ($\frac{\partial g^*}{\partial D} > 0$), if the following condition is satisfied:

$$\begin{aligned} &\pi'(g^*)\left[u'\left(\bar{I}-g^*+D\right)+u'\left(\bar{I}-g^*-D\right)\right] \\ &> \left(\bar{p}-\pi(g^*)\right)\left(-u''\left(\bar{I}-g^*-D\right)\right)+\left(\bar{p}+\pi(g^*)\right)u''\left(\bar{I}-g^*+D\right) \end{aligned} \tag{2}$$

The terms in condition (2) for $\frac{\partial g^*}{\partial D} > 0$ have clear economic interpretations. On the left-hand side, $\pi'(g)[u'(\bar{I}-g+D)+u'(\bar{I}-g-D)]$ represents the increased marginal benefit of donating via the spiritual insurance channel. As background risk D rises, this term reflects how donation shifts subjective probabilities, enhancing perceived protection against adverse outcomes. On the right-hand side, $(\bar{p}-\pi(g))(-u''(\bar{I}-g-D))+(\bar{p}+\pi(g))u''(\bar{I}-g+D)$ captures the income effect, where higher income uncertainty increases the marginal cost of donations due to reduced consumption utility.

Comparing the two sides of condition (2), we see that this condition reflects the balance between two opposing forces: the spiritual insurance channel, which increases donations as in-

[5] Positive prudence is a weaker assumption than DARA. In our bank transaction dataset, we also observe that higher income uncertainty generally leads to more insurance purchases, consistent with positive prudence.

come uncertainty rises, and the traditional income effect, which reduces donations as uncertainty increases. If the spiritual insurance channel is sufficiently strong, i.e., condition (2) holds, the model predicts that optimal donations will increase with greater income uncertainty. This stands in contrast to the model without spiritual insurance, where uncertainty tends to lower donations.[6]

We summarize these findings in Proposition 1 (full proof given in Online Appendix A.2), which formalizes the result that if the spiritual insurance channel is strong, the optimal donation size will rise as the background risk D increases:

Proposition 1 *In the model with a spiritual insurance motive, if the spiritual insurance channel is strong enough, i.e., condition* (2) *holds, then the optimal donation size* g^* *rises in background risk* D.

The prediction in Proposition 1 with a strong enough spiritual insurance motive contrasts with that in Lemma 1 without it. Hence, estimating the relationship of donations with income uncertainty provides a test that potentially distinguishes the spiritual insurance motive: A null or negative relationship between donations and income uncertainty would suggest that the spiritual insurance motive is nonexistent or weak. However, suppose donation is found to be positively related to income uncertainty, such evidence would support a strong spiritual insurance motive in donations.

The spiritual insurance explanation hinges on the (non-traditional) insurance function of the donation. In our data, we also observe insurance purchases in addition to donations. Therefore, we provide an extended model that introduces expense risks (in addition to income risks) and insurance purchases. We detail the setup and proofs of the extended model in (Online Appendix A.3).

The extended model motivates more tests of the spiritual insurance channel based on how donation and the purchase of market-based insurance interact with each other. The primary prediction when we compare the extended model with spiritual insurance to the extended model without spiritual insurance is summarized in Proposition 2 (Online Appendix A.3): If the spiritual insurance channel is strong enough—per a condition that resembles condition (2)—then increasing donations can reduce the need for market-based insurance, as donations lower the perceived risk of a low-income state. On the other hand, purchasing insurance may reduce donations. However, if the spiritual insurance channel is weak or absent, the relationship between donations and the purchase of insurance is reversed.

Guided by the above discussion of the baseline and the extended model, we proceed to empirically examine the relationship of donations with income uncertainty, and the relationship between donations and insurance purchases.

3. Bank Transaction Data Analysis

[6] Condition (2) is easy to hold. In Online Appendix A.2 and Figure A1 we conduct a simulation exercise and find that (2) holds in 94.7% of a wide range of parameter combinations that we consider reasonable.

3.1 The Data

Our dataset allows us to examine the relationship between income uncertainty, donations, and insurance purchases using detailed transactional records from individuals at firms that use the same major commercial bank in Taiwan for direct deposits. The dataset provided by the Bank, with both individuals and firms anonymized to preserve privacy, includes a comprehensive range of financial data across various account types, including detailed transaction records and monthly balances for checking, savings, credit cards, stocks, mutual funds, insurance, mortgage, and consumer loans, as well as demographic information (gender, marital status, age, education, occupation, number of dependents, and city).

The data from the Bank cover a two-year period, from July 2013 through June 2015. Our analysis focuses on full-time workers aged 18 to 55 who are employed at firms using the Bank for consecutive direct deposits during the 24-month period, and who also use the Bank's credit card.[7] We focus on individuals before the retirement age to ensure the observed income fluctuations are not driven by predicted income changes due to retirement. Our final sample consists of 74,023 individuals with records on payroll income, credit card spending, and insurance purchases. To account for the infrequent occurrence of donations and insurance purchases, we aggregate transaction-level data to the individual-quarter level, resulting in 592,184 individual-quarter observations.

Summary statistics are provided in Table 1. The average and median monthly payroll incomes in the sample are 4,067 USD and 2,200 USD, respectively. This median income exceeds the census median income of 1,200 USD, indicating that our sample represents a group of higher-income individuals with access to financial services.[8] The distribution of payroll income is right-skewed, leading us to use the logarithm of payroll income and the corresponding uncertainty measures in our analysis.

[Table 1 here]

We observe donations that these individuals make as part of their credit card transactions. Our dataset categorizes each donation into one of two types: religious or secular. This distinction is based on whether the recipient is a religious charity. Of all observations with a non-zero donation amount at the individual quarter level, 61% made donations to religious organizations, while 42% made donations to secular organizations, with some individuals contributing to both types in the same quarter. The share of clients who donated during the sample period is 6.27%. Additionally, 2.09% of all sample individuals donated in more than one quarter. Observations with a non-zero donation amount constitute 1.46% of the sample at the individual-quarter level.

A large majority (92.8%) of the sample's religious donations go to two major evangelical charities. Three Buddhist foundations account for the remainder of the religious donations. Secular donations in our sample go to five charitable foundations without religious affiliations. Notably, both the religious and secular charities in our sample are large, broad-based organizations that

[7] To confirm full-time status, we include only individuals earning at least the minimum wage (635 USD per month) each month. The upper age limit is set at 55, the minimum legal retirement age in the economy.

[8] https://ws.dgbas.gov.tw/win/fies/doc/result/104.pdf

focus on philanthropic causes such as alleviating child poverty, providing humanitarian aid, and supporting the disabled. These beneficiaries differ markedly from the profile of the donors in our dataset so mutual insurance through donation at the local level is less likely.

When we observe the donation transaction on these clients' credit card statements, the conditional average amount of religious or secular donations is 94.39 USD or 94.40 USD, both large economically. These average donation amounts equate to approximately 0.80% of their average quarterly income, which we interpret as a non-negligible proportion that these clients spend on donations.

For these bank clients in our dataset, We also observe the type and amount of each insurance product purchased. The products purchased are primarily critical illness insurance and life insurance, which make up approximately 90% of the observed insurance purchases. We exclude savings and investment insurance products, which account for the remaining 10% of the observed insurance purchases, as their primary purpose is not risk hedging. Nearly half of the bank clients in our sample (45.3%) purchased insurance during the period. Observations with insurance purchases constitute 13.4% of the total sample at the individual-quarter level. For those who purchased insurance in a given quarter, the average amount spent on market-based insurance products was 905.07 USD.

3.2 Measuring Individual-Level Income Uncertainty

In our study, the primary independent variable is income uncertainty. We specifically examine how this uncertainty, formed through individual experiences in the recent past, *predicts* donation behavior. To quantify income uncertainty at the individual level, we use the volatility of realized income over a recent period as a proxy. This approach involves calculating income uncertainty for each individual-quarter observation as the standard deviation of all monthly income realizations over the preceding four quarters.

Following the literature (e.g. Angerer and Lam, 2009, Jurado, Ludvigson, and Ng, 2015), we residualized the monthly income realizations before measuring income uncertainty. The residualization procedure removes predictable components of income fluctuations (e.g., seasonal effects or demographic trends). It involves regressing log payroll income against observable characteristics and then removing the predictable component, using the following statistical model of income:

$$y_{im} = \alpha + \mathbf{X}'_{im}\beta + \mu_m + \varepsilon_{im} \tag{3}$$

where y_{im} refers to the logarithm of monthly payroll income of individual i in month m; $\mathbf{X}_{im}$ denotes the demographic characteristics, including the city of residence, age, age squared, and dummy variables for marital status, education level, occupation, and the number of dependents; μ_m denotes the time fixed effect. In our analysis, we focus on the residuals, $\hat{\varepsilon}_{im}$, from this model, as they represent the unpredicted component of income.[9]

The income uncertainty measure for each individual-quarter observation, $\hat{\sigma}_{i,t-1}$, is calculated

[9]The residualization procedure of income is not crucial to our results. In untabulated results, we conduct tests using income uncertainty measures based on raw payroll income and find similar results.

as the standard deviation of all monthly payroll income residuals, $\hat{\varepsilon}_{im}$, within the recent period M_{t-1}. This is expressed as follows:

$$\hat{\sigma}_{i,t-1} = sd_{m \in M_{t-1}} \left(\hat{\varepsilon}_{im} \right) \tag{4}$$

The recent period M_{t-1} includes all months from the previous four quarters. This duration is long enough to capture meaningful variation in income, but short enough to account for dynamic changes in income that may influence donation behavior. The magnitude of income uncertainty is consistent with findings in the literature.[10] Our results remain robust to alternative durations of M_{t-1}, including shorter periods of three or two quarters.

Our approach to calculating income uncertainty, using data from the recent past, aligns with Di Maggio, Kermani, Ramcharan, Yao, and Yu (2022) who measure firm-level uncertainty through realized volatility of abnormal returns of individual firms, and study the impact of firm-level uncertainty on individual consumption. Similarly, our method, which employs the standard deviation of unpredicted labor income realizations in the immediate past as a proxy for expected labor income uncertainty, is in line with the findings of Meghir and Pistaferri (2004). They demonstrated that volatility in unpredicted labor income realizations from the recent past significantly and positively predicts future labor income uncertainty. Indeed, as detailed later in Section 3.5, our dataset reflects this same pattern.

3.3 Empirical Results

We empirically examine the relationship between income uncertainty and donations and describe the results in this section. These results provide distinguishing information regarding the spiritual insurance channel. To shed more light on this channel, we further provide results on religious donations versus secular donations, the donation change after the downside-risk, as well as results on the substitutability of spiritual insurance with market-based insurance.

3.3.1 The Relationship between Uncertainty and Donations

In this subsection, we analyze the impact of individual-level income uncertainty on donation behavior. Our analysis is based on a predictive specification that utilizes within-person variations fixing an individual and tracking the changes in his realized income uncertainty over time. The

[10] Ganong, Jones, Noel, Greig, Farrell, and Wheat (2020) calculate that the standard deviation of monthly transitory labor income shocks is 0.36 in the Survey of Income and Program Participation and 0.30 in their transactional dataset from Chase Bank. We compute that the sample mean of $\hat{\sigma}_{i,t-1}$ is 0.42, averaging across employees and time. This level of income uncertainty is slightly larger than those in Ganong, Jones, Noel, Greig, Farrell, and Wheat (2020) but on a similar order of magnitude. The source of this uncertainty in the unpredicted component of payroll income can include, for instance, unpredicted changes in bonuses, wage adjustments, and commissions. The sample standard deviation of $\hat{\sigma}_{i,t-1}$ is 0.17, meaning that across persons and within-person across time, individuals may experience different levels of income uncertainty. To isolate variations external to the employee in the empirical analysis, we use firm-level leave-one-out average income uncertainty at each point in time as an instrument for its individual-level counterpart, while simultaneously controlling for a set of fixed effects that include individual fixed effects to ensure we use within-person variations.

econometric model is specified as follows:

$$\text{donation}_{i,t+1} = \beta_1 \hat{\sigma}_{i,t} + \boldsymbol{X}'_{i,t}\gamma + \mu_t + \lambda_i + \varepsilon_{i,t} \tag{5}$$

In Equation (5), the dependent variable, $\text{donation}_{i,t+1}$, represents either the incidence of donating in quarter $t+1$, in which case we estimate a linear probability model, or individual i's donated amount in quarter $t+1$. The main independent variable $\hat{\sigma}_{i,t}$ is the realized income uncertainty experienced by individual i recently before quarter $t+1$. The vector $\boldsymbol{X}_{i,t}$ includes other independent variables and controls such as the log of payroll income, log financial wealth, age, age squared, educational attainment, occupational type, marital status, and number of dependents. . μ_t denotes quarterly time fixed effects, while λ_i represents individual fixed effects. Standard errors are clustered at the individual level to account for potential within-individual correlation in regression residuals.

Our econometric specification improves upon traditional cross-sectional analyses, which often face difficulties in distinguishing the effect of income uncertainty and the influence of unobserved individual characteristics. By using within-person variations and including individual fixed effects, we control for time-invariant characteristics such as a preference for more or less risky jobs or inherent attitudes toward charity. This approach helps isolate the relationship between income uncertainty and donations. Additionally, by using past income uncertainty to predict future donations, we reduce the risk of simultaneity bias or reverse causality.

Panel A of Table 2 presents the estimates of Equation (5) for the predictive relationship of income uncertainty recently experienced up to quarter t on the probability of donation in quarter $t+1$. Columns (1)-(3) present the OLS estimates of the linear probability model. Column (1) includes the baseline individual and quarter fixed effects, column (2) adds the other independent variables control variables, and columns (3) further adds city-by-quarter fixed effects that controls for any city-specific trends in giving. The income uncertainty coefficient barely changes. For brevity, control coefficients are included in the online appendix (Appendix Table A.1).

With a one standard deviation increase in income uncertainty from the past four quarters, the individual is 48% more likely to donate in the next quarter, statistically significant at the 1% level. The increase likelihood to donate is also economically significant considering the average donation amount ($97.1). Even small increases in donation likelihood can lead to meaningful financial impact, given the size of donations and the response to income uncertainty.[11]

Panel B of Table 2 presents the estimates for the donation amount. We find that a one standard deviation increase in income uncertainty over the past four quarters results in a 37% increase in unconditional donations. Together, Panels A and B suggest that the increase in donations driven by income uncertainty mainly arises from the extensive margin—an increased likelihood to donate.

[11] We conducted robustness checks to ensure that our results are not driven by model specification. These include using alternative durations for M_{t-1} and calculating income uncertainty with unpredicted monthly income fluctuations $\hat{\varepsilon}_{im}$ over shorter periods of three or two quarters (see Panels A and B of Appendix Table A.2). Additionally, results remain consistent when aggregating donation transactions at the individual-month level (Panel C of Appendix Table A.2). While the number of observations varies across these specifications, point estimates remain consistent.

[Table 2 here]

The residual payroll income fluctuations that we use to measure income uncertainty arise because of reasons that include unpredicted changes in bonuses, wage adjustments, and commissions. The estimation takes advantage of the fact that the volatility of these fluctuations are observed to change within-individual over time in the dataset. Consequently, the estimates capture differences in in donation behaviors following periods of high versus low experienced income uncertainty for the same individual.

The interpretation of estimates from Equation (5) could be affected by two potential issues. First, the income uncertainty variable may contain some measurement error. Second, it may capture both external income risks and labor supply decisions. To address these concerns, we use the firm-level leave-one-out average income uncertainty as an instrument for individual-level income uncertainty. The leave-one-out approach removes the individual's own income data from the firm average, ensuring the instrument reflects external firm-level uncertainty rather than individual choices. We limit our focus to individuals at firms with 10 or more employees to enhance the relevance of the instrument. By including individual fixed effects, we avoid capturing cross-sectional differences, such as the possibility that religious individuals select into firms with different risk profiles. By relying on firm-level changes that are external to the individual, this instrument addresses variations in income uncertainty driven by firm dynamics, supporting the validity of the exclusion restriction.

The instrumental variable estimates, shown in columns (4)-(6) of Table 2, confirm the positive predictive effect of income uncertainty on donations. The first-stage regression coefficient, which links individual-level income uncertainty to firm-level average income uncertainty, is 0.56. For brevity, this coefficient is not included in Table 2 but reported in Appendix Table A.1. The instrument's relevance is supported by the first-stage F statistic, which exceeds 300, well above conventional thresholds.

According to the IV estimate in column (6) of Panels A and B in Table 2, a one standard deviation increase in income uncertainty over the preceding four quarters raises the likelihood of donating by 130% and increases unconditional donations by 145%, with both effects statistically significant at the 1% level. The IV estimate is larger than the OLS result, consistent with the expectation that instrumental variables help correct for measurement error. This result supports the spiritual insurance channel, where greater income uncertainty encourages higher donations as a protective behavior.

The positive effect of income uncertainty on donations, observed across both OLS and IV estimations, matches the prediction of Proposition 1, which assumes a strong spiritual insurance motive. In comparison, Lemma 1, predicts that in the absence of a strong spiritual insurance motive, higher uncertainty would reduce donations. Our results favor the interpretation that the spiritual insurance motive influences donation behavior.

We summarize our first main empirical finding regarding the predictive relationship between income uncertainty and donations as follows:

Finding 1 *Higher income uncertainty positively predicts more donations, consistent with the prediction of the model with a strong spiritual insurance channel.*

3.3.2 Donation and Spiritual Insurance

While Finding 1 supports the influence of spiritual insurance on how individuals adjust to income uncertainty, several questions remain. First, given that spiritual insurance often represents a belief in "divine intervention", do donations to religious organizations show stronger effects compared to secular charities? Second, in light of the tendency of believers to seek blessings against adversity, is there a more pronounced effect of negative uncertainty? Third, if donation has a spiritual insurance function, do we observe individuals substituting between insurance purchases and donations? Our dataset allows us to conduct further tests to inform these questions and distinguish the predictions of the spiritual insurance model.

Donating for Blessings: Religious and Secular Destinations

To explore whether religion plays a role in the previous result consistent with spiritual insurance that we estimated, we categorize the donations into religious and secular donations based on whether the recipient is a religious organization.

We draw upon Taiwan's census data to contextualize the reasons behind religious donations. We analyze the 2003 Survey on Social Development Trends conducted by the Directorate-General of Budget, Accounting and Statistics, which asked individuals whether they have made a religious donation and whether they have made a secular donation, with the donations categorized by the type of the recipient organization identically to our method on the transactional dataset.

The census survey inquired each donor what was the primary reason for her religious (secular) donation out of five candidate reasons: supporting the organization's mission, giving back to the society, building up charitable deeds and seek blessings, being influenced by family, friends or colleagues, and being persuaded by fundraisers.

As Figure 1 from this census data shows, the most frequently stated reason for religious donations is to "build up charitable deeds and seek blessings" (56%), followed by "giving back to the society" (25%). The observation that 'seeking blessings' is the most common motivation for religious donations provides direct anecdotal evidence of donors believing that their contributions may result in divine blessings.

Secular donations, while driven first and foremost by societal motives, still exhibit some influence from spiritual beliefs (22%). While the census was from a year earlier than the bank transaction data, it is reasonable to believe these attitudes are stable. For example, the 2021 APA-Taiwan survey asked the same question to a sample of donators to secular charities, 22% of which (again) responded with the "seeking blessing" motivation.

[Figure 1 here]

Given the closer connection between religious donations and spiritual motives, we hypothesize that the spiritual insurance effect will be more pronounced for donations to religious charities. To test this hypothesis, we re-estimate Equation (5) separately for each donation type. The

findings, as shown in columns (1)-(2) of Table 3, follow the same specification as column (3) of Table 2 but differentiate between religious and secular donations as separate dependent variables.

[Table 3 here]

The results indicate that income uncertainty positively affects both types of donations, with a more substantial impact on religious donations. Specifically, in Panel A, a one standard deviation increase in income uncertainty over the preceding four quarters raises the likelihood of donating to religious charities by 53%, compared to a 39% increase in the likelihood of donating to secular charities. The difference in coefficients is statistically significant at the 1% level. The absolute magnitude of the effect on religious donation likelihood is 96% greater than that on secular donations, suggesting a meaningful economic distinction.[12]

Considered alongside the significant average donation amount (both approximately $94.4 for religious and secular donations), these increases in donation likelihood can lead to meaningful financial impact and differentiations between the donation destinations, given the size of donations and the response to income uncertainty.

In Panel B, a one standard deviation increase in income uncertainty over the preceding four quarters, leads to a 38% increase in the unconditional amount of religious donations, compared to a 22% increase in the unconditional amount of secular donations. Similar to the result on total donations, the increase in donations driven by income uncertainty mainly arises from the extensive margin—an increased likelihood to donate, especially to religious charities.

A similar pattern is also observed in the IV estimates (columns (5) and (6) of Table 3), where the impact on the likelihood of religious donation is 92% larger, and the coefficient on the likelihood of secular donation is statistically less significant, though the statistical difference between the two types is less precise. The impact on the unconditional amount of religious donation is also 89% larger, consistent with the extensive margin dominating the effects. The stronger effect in religious donations corroborates the high proportion of donations made with the motivation of "seeking blessings," as indicated in Figure 1.

Downside Income Shock as a Negative Shock

American philosopher William James, one of the most influential architects of modern psychology, put forward a utilitarian view that religion improves well-being by providing relief from "evils" in the world (James, 1902). Is the predictive relationship we find stronger for downside risk (e.g., Ang, Chen, and Xing, 2006)?

To better understand this potential distinction, we decompose the income uncertainty measure into positive and negative income uncertainty. We employ the semi-deviation method, a widely used approach for measuring downside risk (e.g., Segal, Shaliastovich, and Yaron, 2015). We then estimate the predictive effects of positive and negative income uncertainty on religious

[12] We compare the degrees to which spiritual insurance predictions manifest in religious versus secular donation behaviors in multiple ways in this section. We address multiple hypothesis testing following the stringent Romano and Wolf (2005) procedure, as detailed in Online Appendix A.5, and this statistically significant difference between religious and secular donations is robust.

and secular donations.[13]

The estimation results are shown in columns (3) and (4) of Table 3. We find that both negative and positive income uncertainty significantly predict increases in religious and secular donations. However, the point estimates for negative income uncertainty are larger. Specifically, a one standard deviation increase in $\hat{\sigma}^{\text{neg}}$ ($\hat{\sigma}^{\text{pos}}$) leads to a 30% (21%) increase in the likelihood of religious donations and a 23% (11%) increase in the likelihood of secular donations. While both effects are statistically significant, negative income uncertainty has a stronger impact.[14]

In columns (7) and (8) of Table 3, we present IV estimates that employ firm-level average positive and negative income uncertainty as instruments for their individual-level counterparts. These estimates further validate the observed pattern, showing larger point estimates for negative income uncertainty, although with reduced statistical significance for both positive and negative income uncertainty. According to the IV estimates, a one standard deviation increase in negative income uncertainty leads to a 119% increase in the likelihood of religious donations and a 151% increase in the unconditional amount of religious donations. It is noteworthy that in these IV estimates, the only predictive effect statistically significant at the 10% level is the effect of negative income uncertainty on religious donations.

Health Shock as a Negative Shock

Besides income uncertainty, an important form of concrete adverse shock closely related to religious donation is disease. For instance, in a meta-analysis on religion and health in the Lancet, Sloan, Bagiella, and Powell (1999) mentions that in a poll of 1000 US adults, "79% of the respondents believed that spiritual faith can help people recover from disease." In line with this reasoning, we investigate whether spiritual insurance also manifests in response to health shocks. Disease is a negative shock to a household's financial situation because it implies not only medical expenditures, but also a possible decline in future income due to health outcomes.

According to the spiritual insurance hypothesis, a health shock may (somewhat counterintuitively) lead to an increase in donations, as households facing adversity may seek blessings and healing. Thus, we investigate how health shock as a negative shock affects people's donation behavior. We also view health shock as relatively exogenous, so its relationship with donation serves as an additional and cleaner test of the spiritual insurance motive.

We define a health shock as incurring medical expenditures in the past quarter that are above

[13] Positive and negative income uncertainties are calculated based on whether an individual's demeaned residual income in a given month is above or below zero. Specifically, the calculations are as follows:

$$\hat{\sigma}^{\text{pos}}_{i,\{t-1,\ldots,t-T\}} = \sqrt{\frac{1}{T-1}\sum_{s=t-T}^{t-1} \mathbb{I}\{\Delta\hat{\varepsilon}_{is} \geq 0\}\, \Delta\hat{\varepsilon}_{is}{}^2}; \quad \hat{\sigma}^{\text{neg}}_{i,\{t-1,\ldots,t-T\}} = \sqrt{\frac{1}{T-1}\sum_{s=t-T}^{t-1} \mathbb{I}\{\Delta\hat{\varepsilon}_{is} < 0\}\, \Delta\hat{\varepsilon}_{is}{}^2},$$

where $\Delta\hat{\varepsilon}_{is}$ is the demeaned residual income for individual i in month s ($\Delta\hat{\varepsilon}_{is} \equiv \hat{\varepsilon}_{is} - \frac{\sum_{\tau=t-T}^{t-1} \hat{\varepsilon}_{i\tau}}{T}$).

[14] If we compare the non-normalized regression coefficients, negative income uncertainty has an even larger impact, as one standard deviation in $\hat{\sigma}^{\text{neg}}$ (0.11) is smaller in absolute units than one standard deviation in $\hat{\sigma}^{\text{pos}}$ (0.13).

the positive median of the sample.[15] The regression model is specified as follows:

$$\text{donation}_{i,t+1} = \beta_1 \text{health shock}_{i,t} + \boldsymbol{X}'_{i,t}\gamma + \mu_t + \lambda_i + \varepsilon_{i,t} \tag{6}$$

In this model, $\text{health shock}_{i,t}$ is operationalized either as a dummy variable indicating the occurrence of at least one health shock in the past quarter or, for robustness, as the standardized amount of above-median medical expenditures during that period. The other variables in the equation are defined consistently with Equation (5).

[Table 4 here]

Table 4 shows the health shock results. We find that health shocks, under both measures, positively predict the likelihood of donation in the following quarter. Specifically, the coefficient in column (1) suggests that experiencing at least one health shock in the past quarter leads to a 270% increase in the likelihood of donating in the subsequent quarter. Similarly, the results in column (4) indicate that a one standard deviation increase in health shock spending predicts a 52% increase in the likelihood of donation.

Consistently, experiencing at least one health shock in the past quarter leads to a 146% increase in the unconditional donation amount, while a one standard deviation increase in health shock spending predicts a 31% increase in unconditional donations. These findings suggest that health shocks drive individuals to increase donations primarily through the extensive margin, as they become more likely to donate.

The remaining columns of Table 4 detail the predictive effects of health shocks on religious and secular donations separately. The response of religious donations to health shocks is significant. According to the results in columns (2) and (3), the occurrence of at least one health shock in the past quarter leads to a 354% increase in the likelihood of religious donation in the following quarter, and a 236% increase in the unconditional amount of donation, both significant at the 1% level.

The response of secular donations to health shocks is more varied–the likelihood of secular donation increase significantly by 139%, but the unconditional amount of secular donation has no statistically insignificant increase (p-value of 0.377). Results for the dollar amount of health shocks show a similar pattern, that the increase in medical expenditures leads to robust and significant increase in religious donations, while it leads to smaller and less robust increase in secular donations.

Put together, the positive relationships between income uncertainty/health shock and donations substantiate the idea that spiritual insurance, particularly through religious donations, serves as a response to uncertainty or adverse events. We summarize our second main finding as follows:

Finding 2 *The predictive effect of income uncertainty on donations is stronger for religious donations. Furthermore, the increase in religious donations is particularly evident following negative*

[15] We exclude transactions related to cosmetic surgery to ensure that these expenditures indeed represent negative shocks. For robustness, we also vary the window of health shock to the past two quarters or adjust the window of future donations to one month. Our findings remain consistent across these different specifications.

income uncertainty. Health shock, another prominent negative shock, also predicts more religious donations.

3.3.3 The Substitutability between Spiritual Insurance and Insurance Products

The extended model's prediction in Section 2 motivates our examination of the relationship between donations and insurance purchases. If a spiritual insurance motive indeed underlies donations and is strong enough, Proposition 2 says we should observe a pattern of substitutability between spiritual insurance and market-based insurance, within the same period.

To test this prediction, we ask whether individuals reduce insurance purchases in periods when they make donations. Further, we examine whether this relationship is more pronounced for religious donations. To assess this potential substitutability, our empirical specification is designed as follows:

$$\begin{aligned} \text{insurance}_{i,t+1} =& a_1 \cdot \mathbb{I}\{\text{donation}_{i,t+1} > 0\} + a_2 \cdot \hat{\sigma}_{i,t} \\ &+ \boldsymbol{X}'_{i,t}\gamma + \mu_t + \lambda_i + \varepsilon_{i,t} \end{aligned} \tag{7}$$

where $\text{insurance}_{i,t+1}$ is the amount of insurance individual i purchased in quarter $t+1$, and $\mathbb{I}(\text{donation}_{i,t+1} > 0)$ is a dummy variable that takes the value of 1 when individual i is observed to donate least once in the same quarter. The dummy variable approach means that we focus on the extensive margin of donations that drives our primary results, but is not essential—we also replace the dummy variable with the dollar amount of donations and present the results.

To reflect that income uncertainty influences both insurance purchases (Guiso and Jappelli, 1998) and donations, we include the ex-ante predictor variable $\hat{\sigma}_{i,t}$ as a control variable. Other variables are defined as before, meaning that we still focus on within-person variations. The inclusion of individual fixed effects helps account for unobserved, time-invariant individual characteristics that might influence both donation and insurance behaviors. Because we control for individual fixed effects, the coefficient of interest, a_1, measures the within-person difference in insurance purchases between individual-quarter observations in which the individual donates and those in which she does not donate.

We examine this difference, as captured by a_1, to explore whether donations and insurance purchases tend to be complementary or substitutable within the same quarter $t+1$. We estimate Equation (7) first for donations to any charity, then for donations to religious charities, and donations to secular charities separately. Table 5 present the results.

As a pre-test, the ex-ante predictor variable income uncertainty recently experienced—as a control variable here—consistently positively predicts insurance purchases, sharing a similar pattern to income uncertainty predicting donations. This positive effect of income uncertainty on insurance purchases aligns with expectations from risk-averse behavior with positive prudence and corroborates findings in the background risk literature, such as Guiso and Jappelli (1998)).

In Panel A of Table 5, we explore when an individual donates at least once in a given quarter, do we observe reduction in insurance purchases. Column (1) shows a negative estimate of

a_1, suggesting a reduction on average in insurance purchases when charitable donations is observed. Specifically, using within-person variations, we observe that when an individual donates at least once in a given quarter, her average insurance purchases decrease by 80.4 USD. This reduction, amounting to approximately a third of the unconditional sample mean, is statistically significant at the 1% level.

In Panel B, we observe a consistent result, that each $1 of donation is associated with a $6.36 reduction in insurance spending. That donation is linked disproportionally to insurance expenditures is a novel finding. This negative estimate of a_1 is consistent with the prediction of Proposition 2 under a strong spiritual insurance motive, and appears to be consistent with the interpretation of an economically significant role of spiritual insurance.

As with the health shock findings, a significant substitutable relationship is observed only with religious donations. The estimate of a_1 in column (2) of Panel A shows that in within-person variations, a 98.67 USD reduction in insurance purchases when individual i donates to a religious charity, amounting to approximately 41% of the average quarterly insurance spending.

Similarly, Panel B shows each $1 of religious donation is associated with a $6.4 reduction in insurance spending. In comparison, as shown in column (3), the reduction in insurance purchases associated with secular donations has a smaller coefficient and is statistically insignificant.

[Table 5 here]

We are also interested in how donation potentially interferes with the nexus between income uncertainty and insurance purchases. We, therefore, propose the following specification:

$$\begin{aligned} \text{insurance}_{i,t+1} =& a_1 \cdot \mathbb{I}\{\text{donation}_{i,t+1} > 0\} + a_2 \cdot \hat{\sigma}_{i,t} \\ &+ a_3 \cdot \mathbb{I}\{\text{donation}_{i,t+1} > 0\} \cdot \hat{\sigma}_{i,t} \\ &+ \boldsymbol{X}'_{i,t}\gamma + \mu_t + \lambda_i + \varepsilon_{i,t} \end{aligned} \tag{8}$$

The coefficient of interest is a_3, on the interaction term of the donation indicator in quarter $t+1$ and income uncertainty experienced just before the quarter. It reflects whether and by how much the sensitivity of insurance purchases to income uncertainty is changed when individual i is observed to donate at least once, compared to when individual i is not observed to donate. All other variables are defined as before.

The estimation results of Equation (10) are shown in columns (4) to (6) of Table 5, which differentiate between donation types. These results indicate that donations, particularly religious donations, are associated with changes in the sensitivity of insurance purchases to income uncertainty. Column (4) of Panel A shows that when individuals donate at least once in a given quarter, their insurance purchases are no longer predicted by income uncertainty. Specifically, while a one standard deviation increase in income uncertainty predicts a statistically significant 88.09 USD increase in insurance purchases when individuals do not donate, the same increase leads to a statistically and economically insignificant reduction of 9.59 USD when individuals do donate.

The results in columns (5) and (6) of both Panels in Table 5 show that a significant change in

the sensitivity of insurance purchases to income uncertainty is only observed when individual i makes a religious donations. The corresponding change in this sensitivity of insurance purchases to income uncertainty when the individual makes a secular donation is smaller and statistically insignificant.

One other possibility that could account for the patterns in Table 5 is the presence of financial constraints (e.g., Yao and Zhang, 2005). Does the substitutability pattern hold for individuals who are unlikely to be financially constrained? While the differing effects between religious and secular donations already suggest that financial constraints are not the driving factor, we further test this by focusing on individuals who are unlikely to face such constraints. We conservatively define these individuals as those whose monthly income consistently exceeds their total expenditures, including consumption and the higher of their actual maximum or sample average monthly spending on insurance and donations. Restricting the analysis to these individuals, we find similar results (see Appendix Table A.6). This consistency across financial contexts supports the conclusion that the relationship between donations, particularly religious donations, and insurance purchases is not driven by financial constraints.

Further, to ensure that the substitutability result is not due to statistical chance or false positives, we conduct a placebo test, replacing the indicator variable representing donation with a indicator variable representing high consumption spending, with several specifications differing in the threshold of defining the high consumption spending indicators. We find no negative relationships between these placebo high-spending indicators and insurance purchases (see Appendix Table A.7).

The observed substitutability between donations and insurance purchases, particularly with religious donations, provides evidence consistent with the spiritual insurance channel. We summarize these findings as follows:

Finding 3 *Conditional on donating, especially conditional on donating to religious charities, people (a) buy less insurance, and (b) their insurance spending is no longer related to income uncertainty, even for individuals unlikely to be financially-constrained.*

3.4 Examining Alternative Explanations

We have discussed early on that Finding 1, the positive predictive effect of income uncertainty on donations, is hard to explain with existing donation theories. Now that we have reported more of our empirical findings (Findings 2 and 3), we further examine whether they distinguish spiritual insurance and alternative explanations.

Mutual Insurance

One alternative explanation of the positive relationship between income uncertainty and donation is that religious donations serve as a form of informal insurance. By donating, individuals may strengthen ties within their community (e.g., a church), which then provides reciprocal support during future adverse shocks. Empirical evidence supports this mutual insurance mechanism, as that households who donate to a religious organization are better able to insure their

consumption (Dehejia, DeLeire, and Luttmer, 2007). However, in our data, this mutual insurance channel is unlikely to apply. The donations we observe are directed to broad-based charities, aiding unfamiliar people in various disadvantaged groups across and outside the economy, individuals who do not directly overlap with the donors' social groups. Thus, there is unlikely an effect on mutual help in the community.

We nonetheless try to address the potential of mutual insurance as much as possible by replicating the specification of Dehejia, DeLeire, and Luttmer (2007) with our data. Specifically, we analyze whether the religious donations in our dataset—credit card donations to large, non-local religious organizations—affect consumption insurance, measured as the pass-through of income growth to consumption growth. As reported in Appendix Table A.8, our results show no improvement in consumption insurance from either religious or secular donations to broad-based charities. This suggests that, in our context, donations as spiritual insurance do not function through informal consumption insurance within the community.

Increased Altruism

Another possible explanation is increased altruism: individuals' experience of income uncertainty or health shocks might heighten their sympathy and, in turn, altruism toward those in need. While Finding 1, that higher income uncertainty predicts a significant increase in total donations, may initially appear to align with increased altruism, if altruism were the main driver, we would expect similar effects for both religious and secular donations. However, Finding 2, the clear distinction between these two types of donations following health shocks, points to an inconsistency with a simple increase in altruism.

Further, this explanation also cannot predict the observed substitutability between religious donation and insurance purchases (our Finding 3). Indeed, increased altruism would not generate the same implications on traditional insurance behaviors. We illustrate this inability by discussing the prediction of the initial model without spiritual insurance but with an increased altruism motive (Appendix A.4). Indeed, when this motive is strong enough, optimal donations increase with the size of income uncertainty. However, this motive does not generate the substitutability between insurance purchases and donations. Intuitively, ex-ante donating more in anticipation of uncertainty reduces available economic resources ex-post, potentially increasing the need for insurance. This dynamic makes insurance purchase and donation complements, rather than substitutes, in the model solely influenced by the increased altruism motive.

Income Seasonality

Income uncertainty in our sample can arise from fluctuations in commissions, performance-based compensation, wage raises and wage cuts, as well as bonuses. To ensure our results are not driven by the seasonality of these income fluctuations, we have controlled for the month-of-the-year fixed effects in all our regressions.

Furthermore, we recognize that bonuses, customarily paid in a few months, constitute a particular seasonal component of income. While we view as plausible that individuals may do good deeds to sway blessings in a favorable bonus outcome, we also conducted an additional robustness check to ensure that our results are not purely driven by the seasonality of annual bonuses,

detailed in Appendix Table A.9. Here, we stringently exclude payroll observations from January, February, and July, months conventionally likely for annual bonus payouts, in our computation of income uncertainty. The variations in labor income uncertainty then primarily come from commissions and within-year aspects of performance-based pay. The consistency of our findings, even after this exclusion, underscores their robustness, confirming that our results are not artifacts of income seasonality.

Tax Considerations

Appendix Table A.10 shows the predictive effect of income uncertainty on donations controlling for tax considerations, to address the potential that income uncertainty may be correlated with the price of giving. The donations in our dataset qualify for tax exemptions, which effectively reduces the cost of giving to one minus the marginal tax rate. We do not directly observe the marginal tax rate of the individuals. To address this, we implemented two methods for imputing marginal tax rates: (1) extrapolate based on monthly payroll income, multiplied by an annualization factor of twelve, to estimate expected annual income, and the associated marginal tax rate; (2) use ex-post annual income for observations with a complete calendar year in our dataset (i.e. all observations in 2014), and for other observations (i.e. observations in 2013 and 2015), extrapolate annual income by applying the whole sample seasonality adjustment factors, to arrive at the corresponding marginal tax rate.

Our results remain consistent across both imputation methods for the price of giving. And, including these marginal tax rates as an additional control variable does not change our study's outcomes. This reinforces the robustness of our findings on the link between income uncertainty and donation behavior.

3.5 Discussion: Is Future Income Uncertainty Materially Reduced?

One interesting question to be answered post-hoc is whether donations, particularly religious ones, have a significant impact on future income uncertainty. This is possible if donations under spiritual insurance provides psychological comfort, thereby creating a 'self-fulfilling prophecy' effect. Anticipating a better future, individuals may experience less stress in dealing with uncertainty, potentially leading to improved work performance and lower income uncertainty. This possibility involves no supernatural force but can nonetheless achieve a similar result. To more directly explore this question, we test whether donations in the first year of our two-year sample predicts income uncertainty in the second year. The regression specification is follows:

$$\begin{aligned}\hat{\sigma}_{i,year=2} = \rho_0 + \rho_1 \mathbb{I}\{\text{donation}_{i,year=1} > 0\} \\ + \rho_2 \hat{\sigma}_{i,year=1} + \boldsymbol{X}_i' \gamma + \varepsilon_i\end{aligned} \tag{9}$$

where $\hat{\sigma}_{i,year=2}$ denotes the income uncertainty measure for individual i in the second half of our 24-month sample ("second year"). The main regressor, $\mathbb{I}\{\text{donation}_{i,year=1} > 0\}$, is a dummy variable indicating whether individual i donated in the first half of the 24-month sample ("first year"). The coefficient of interest is ρ_1. We control for $\hat{\sigma}_{i,year=1}$, i.e., the income uncertainty mea-

sure in the first year. The other control variables included in $\boldsymbol{X}_i$ are the same as in Equation (5), but are measured for the first year. ε_i is the error term. We estimate Equation (9) separately for donation to any charity, to religious charities, and to secular charities. We also consider an alternative main regressor using the donation amount in the first year. These estimation results are shown in Table 6.

[Table 6 here]

The results in Table 6 suggest that donation activities in the first year, whether in existence or amount, do not significantly predict income uncertainty in the second year. This holds true for both religious and secular donations.[16] On the other hand, income uncertainty experienced in the first year does significantly and positively forecast income uncertainty in the second year. This is consistent with Meghir and Pistaferri (2004), and provides assurance on our approach using an income uncertainty measure based on realized volatility.

Collectively, we do not find evidence that donation have a material effect on future income uncertainty, suggesting that the anticipated blessing associated with spiritual insurance are wishful in a material sense. Considering the observed reduction in insurance purchases, such spiritual insurance behaviors could inadvertently heighten risk exposure.

However, what we find does not rule out, and may even align with belief-based utility models (e.g., Caplin and Leahy, 2001; Brunnermeier and Parker, 2005). They may align in the sense that donations, especially religious donations, may enhance psychological utility despite no significant effect on material well-being.

4. The Field Experiment on Spiritual Insurance Narratives

To directly test the causal impact of spiritual insurance on donation behavior—specifically, the concept of performing good deeds in exchange for blessings— we analyze a unique field experiment conducted by one of the largest charitable crowdfunding platforms in mainland China and globally (referred to as Platform X) which utilizes the spiritual insurance narratives.

Platform X, which primarily aids low-income patients with serious illnesses, had supported millions of patients by the end of 2023, with a user base in the hundreds of millions and donations totaling billions of USD. These figures represent a substantial portion (around 10%) of total charitable giving in mainland China. On Platform X, patients in need can initiate campaigns by submitting verifiable medical and financial details. Once approved, these campaigns are accessible to Platform X's user base, with detailed information about the patient's condition and financial needs, enabling donors to make informed decisions.

[16] Given our observation that income uncertainty predicts donations, as delineated in Finding 1, yet donations do not forecast income uncertainty, we can infer a lack of reverse causality in this relationship in a "Granger" sense. This directional clarity adds further robustness to our findings, confirming that the effect of income uncertainty on donations is not reciprocally influenced by the impact of donations on income uncertainty.

4.1 Experimental Design

This experiment on Platform X evaluated how spiritual insurance narratives could influence donation behavior, particularly by invoking a sense of protection through good deeds. In the treatment group, potential donors saw a modified donation interface that included the message: "Do good deeds and receive blessings" beneath the "Donation" button. Figure 2 provides an illustration of the interface and treatment. This subtle change was intended to emphasize the idea that performing good deeds might lead to blessings—in the form of divine favor or protection from a higher power—as a form of spiritual insurance against future uncertainty. In this context, "blessings" signify anticipated divine favor, representing a personal and spiritual form of insurance that is distinct from social or community-based mutual insurance mechanisms. The control group experienced the standard donation interface without this message.

[Figure 2 here]

Running from July 28 to August 15, 2022, the experiment's randomization was at the user level, ensuring consistent treatment for individuals who encountered multiple campaigns. There were approximately 4 million participants who were nearly equally assigned to the treatment and control groups. In total, we observe that they visited numerous campaigns on the platform approximately 7.5 million times and obtained summary results accordingly.[17]

4.2 Data Description and Balance Tests

The analysis includes two data sets: donor behavior and fundraiser characteristics. Donor data included donation behavior, age, location, the way they learned of each campaign, historical donation activities, anonymous donation history, and social distance within the donation network. Fundraiser data covered disease type, campaign details, target amount, patient age, patient gender, and insurance coverage.

Random assignment ensured comparability between groups, as confirmed by balance tests. The balance tests were carried out on 20 covariate dimensions including the age of the experiment subjects, the historical and recent donations behaviors of the experiment subjects, and the details of the campaigns visited by the experiment subjects (see Appendix Table A.12). Our sample revealed that most of the campaign patients were covered by basic health insurance but still faced significant financial burdens, particularly with cancer diagnoses. The average campaign target was approximately 42,000 USD. Patients on average wrote more than 848 characters in the campaign description and uploaded more than 7 photos to appeal others to donate. Donors, on average, had interacted with over 35 campaigns and donated in 4 campaigns prior to the experiment, with a total average donation of 18 USD. Donor activity, both historical and recent, suggested vitality within the platform community. The majority of participants received campaign links through timeline posts on social media (84%), and resided in a different city than that of the patient (68%).

[17] We designed the data analysis plan and submitted it to Platform X, which conducted analysis within the platform. Data remains within Platform X's premises and is not extracted. We only obtained the results of the analysis as requested.

4.3 Experiment Results and Discussions

Average Treatment Effects

Our primary interest in the field experiment was to assess whether donations were influenced by the spiritual insurance narrative, captured in the six-word phrase 'do good deeds and receive blessings' placed below the donation button. The results, shown in Figure 3, indicate an increase in the likelihood of donating due to this treatment. In the control condition, the donation likelihood was 5.752%, while in the treated condition, it rose to 5.806%. This 0.93% increase in donation likelihood is noteworthy given the subtlety of the intervention, which occupied only 1/40th of the screen. These effects are approximately a quarter of those found in Chan, Liao, Martin, and Wang (2023), whose experiment involved a more prominent modification of the donation screen, with a message placed centrally and occupying significantly more space, showing the donation information of the potential donor's friends, and found a deterrent effect of peer comparison pressure on donations. The treatment's effect size is significant, particularly given the minimal adjustment to the donation interface. No significant change was found in donation amounts (the intensive margin), suggesting that the spiritual insurance narrative influenced the likelihood of donating rather than the donation amounts.

[Figure 3 here]

Heterogeneous Treatment Effects: Regional Variations in Spiritual Narratives

Cultural variations (Stulz and Williamson, 2003; Guiso, Sapienza, and Zingales, 2006) might influence the impact of our spiritual insurance narrative treatment. In regions with greater exposure to beliefs of fate determined by supernatural forces, larger treatment effects may be observed. To explore this, we utilized the Baidu search index—akin to Google trends (Shiller, 2017)—from Baidu, the largest search engine in the country where the experiment was conducted. This index measures the frequency of keyword searches in a given geographical area, adjusted for the base of all searches. We selected the prefectural city level, comparable to the Metropolitan Statistical Area (MSA), as our regional unit.

To gauge pre-exposure to beliefs of fate, we concentrated on eight specific keywords that traditionally signify narratives of fate being influenced by a higher power ("spiritual narratives") and have substantial web search volume.[18] We collected city-level standardized search activities for each keyword in 2022 as the spirituality-related Baidu search index, and then conducted principal component analysis, keeping the first principal component. We then winsorize this first principal component at the 1% and 99% level and use its z-score. This component captures the dominant search behavior patterns related to spiritual narratives across the selected keywords.

If this first component of the spirituality-related Baidu search indices indeed captures spiritual narratives, and if spiritual insurance is a factor driving donations on Platform X *de-facto*, then we expect the component to significantly correlate with city-level donations. Column (1)

[18] These keywords were "God of Wealth" (cái shén), "Feng Shui" (fēng shuǐ), "auspicious day of the zodiac" (huáng dào jí rì), "warding off evil spirits" (pì xié), "praying for good luck" (qí fú), "burning incense" (shāo xiāng), "karma" (yīn guǒ), and "I Ching/Book of Changes" (zhōu yì).

of Table 7 reports the coefficient estimate of a univariate regression of average donations (calculated as city total donations on Platform X during the experiment period per million residents) across 290 prefectural cities on this first principal component. Column (2) adds control variables such as per-capita income, public expenditures, and coverage of public programs, similarly z-scored. Indeed, estimates of the coefficient on the component in both univariate and multi-variate regressions shows that this city-level measures of pre-exposure to spiritual narratives significantly and positively correlate with per-capita donations on Platform X.

[Table 7 here]

Then, we estimate the relationship between the first principal component of the spirituality-related Baidu search indices that measures pre-exposure to beliefs of fate, and treatment effects on donation likelihood in the field experiment. This is done by regressing the latter on the former at the city-level, with both winsorized at the 1% and 99% level and z-scored. Column (3) reports the univariate coefficient, and column (4) adds the same set of city-level controls. This analysis yielded a univariate (multivariate) coefficient of approximately 0.124 (0.174) for the spirituality-related index, achieving statistical significance at the 5% level (p-value=0.034 without controls and p-value=0.011 with controls). This finding suggests a significant positive correlation between a city's pre-exposures to beliefs of fate and its residents' responsiveness to our experimental treatment. Specifically, a one standard deviation increment in the principal component—reflecting increased spirituality levels within a city—corresponds to a 0.124 (0.174) standard deviation elevation in the treatment effect. Figure 4 visually illustrates this relationship, suggesting that regions with stronger spiritual or superstitious beliefs may exhibit more pronounced reactions to the spiritual narrative introduced in the field experiment.

[Figure 4 here]

Collectively, the experimental findings from Platform X corroborate our initial findings from the archival data and provide a tangible demonstration of how spiritual narratives influence donation behaviors. The alignment of results from both the archival data and the field experiment further strengthens the likelihood that the spiritual insurance channel is a significant driver of donation behaviors.

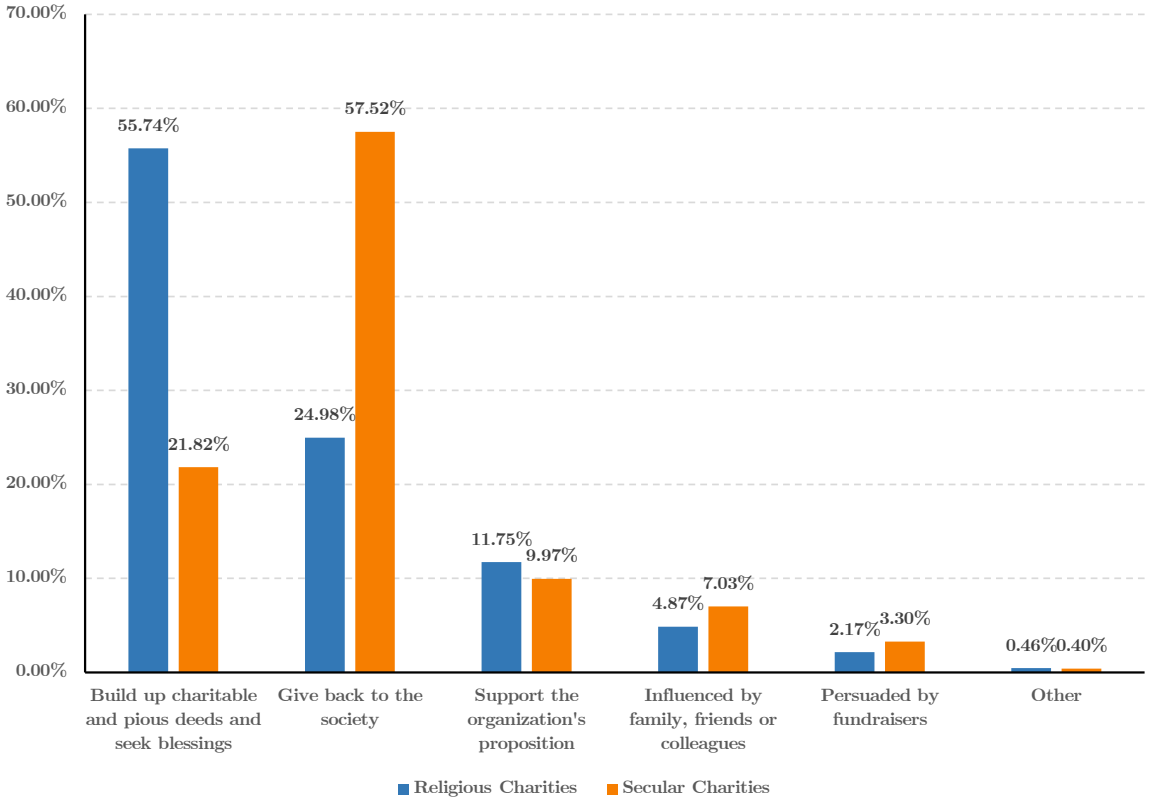
5. Conclusions

Using data from a large commercial bank, we examine how individuals respond to increased income uncertainty by donating. The analysis suggests that donations may act as a form of non-financial hedging, particularly religious donations, which show a stronger response to increased income uncertainty compared to secular donations. Additionally, health shocks—another major source of financial strain—are associated with an increase in religious donations. These findings raise the possibility that donations could substitute for market-based insurance, altering the relationship between income uncertainty and insurance demand. A field experiment that introduced a spiritual insurance narratives into the donation interface—specifically, the concept of

performing good deeds in exchange for blessings—suggests that spiritual insurance narratives have an effect. However, the belief underlying spiritual insurance appears to be wishful thinking, as our analysis shows that donations do not reduce future income or consumption uncertainty.

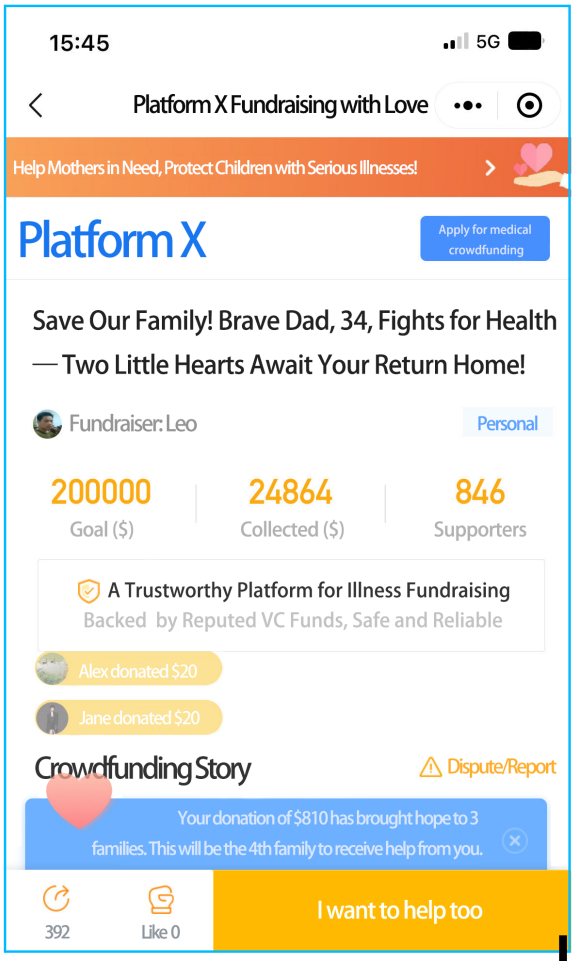
These results provide a new perspective on how individuals "deal with risk" broadly defined, particularly in response of economic uncertainty. They may help explain the counterintuitive patterns observed by List (2011), where donations increased during periods of heightened economic volatility. Additionally, they may be relevant for the financial market for insurance products affected by frictions such as conflicts of interest (e.g. Egan, Ge, and Tang, 2022) and uninsurable risks (e.g. Aiyagari, 1994). The combination of naturally occurring data to observe behavior and experimental approaches to test narratives, as demonstrated here, offers a valuable methodology for future research. As transactional data on financial decisions—and decisions in areas previously loosely connected to finance—becomes more accessible, our findings encourage further exploration of how factors beyond those conventionally studied in the academic literature influence financial decisions related to risk. This research direction opens new avenues for understanding the drivers of financial choices and decisions in other areas of economics.

Figure 1: Survey-stated Reasons for Donating to Religious versus Secular Organizations

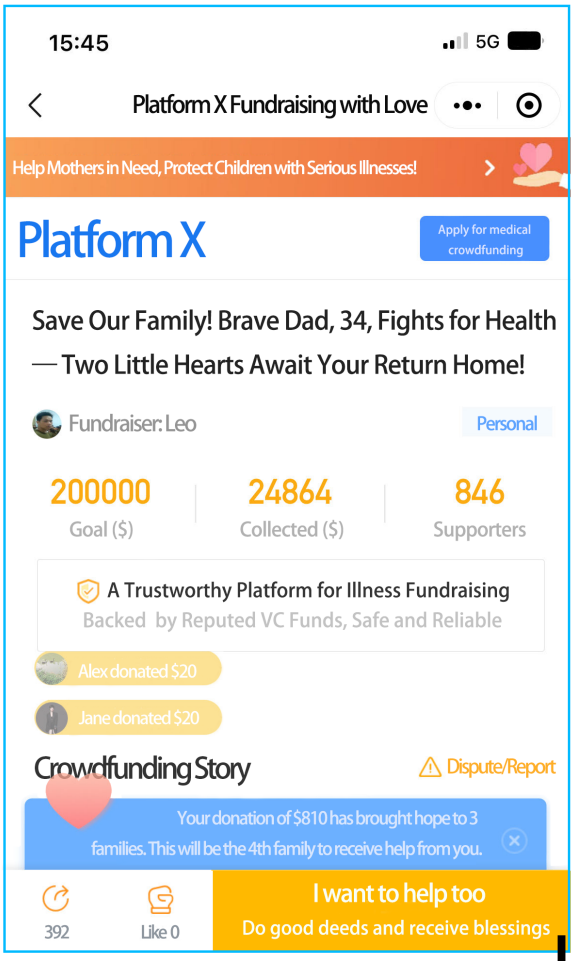


Source: Census of the sample economy. This distribution of primary reasons is calculated out of a sample of a total of 2,630 donors who gave to religious organizations and a total of 2,488 donors who gave to secular organizations.

Figure 2: Illustration of the Field Experiment on Spiritual Insurance Narratives



(a) Donation Page for the Control Group



(b) Donation Page for the Treatment Group

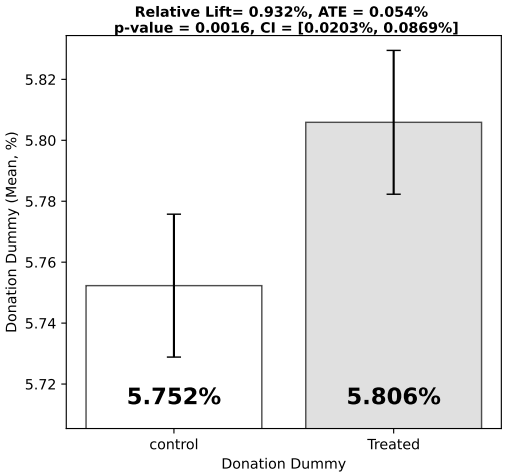
(c) Donation Button for the Control Group

(d) Donation Button for the Treatment Group (with Spiritual Insurance Stimuli Highlighted)

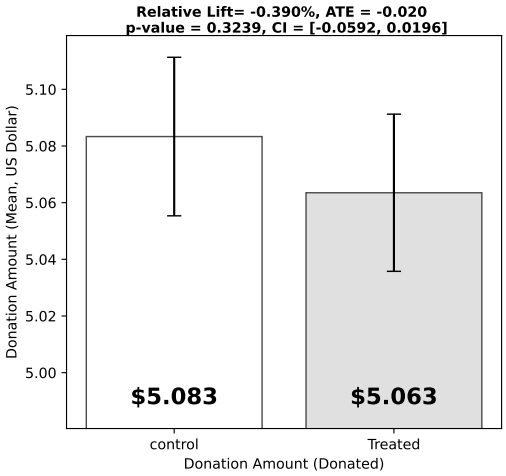
Note: This figure illustrates Platform X's interface (translated to English), and the experiment treatment. Patients in need can initiate campaigns on Platform X by submitting verifiable medical and financial details. These campaigns, upon verification, become accessible to and spread via social network among Platform X's potential donor base. The potential donors view the donation page on their cell phone screens for the the campaign details. For the treatment group of potential donors, the donation button was altered by adding a phrase "do good deeds and receive blessings", which increases the salience of the spiritual insurance narrative. The control group experienced the standard donation page without this message. The experiment ran from July 28 to August 15, 2022.

Figure 3: The Field Experiment: Average Treatment Effect

(a) Effect on Donation Likelihood

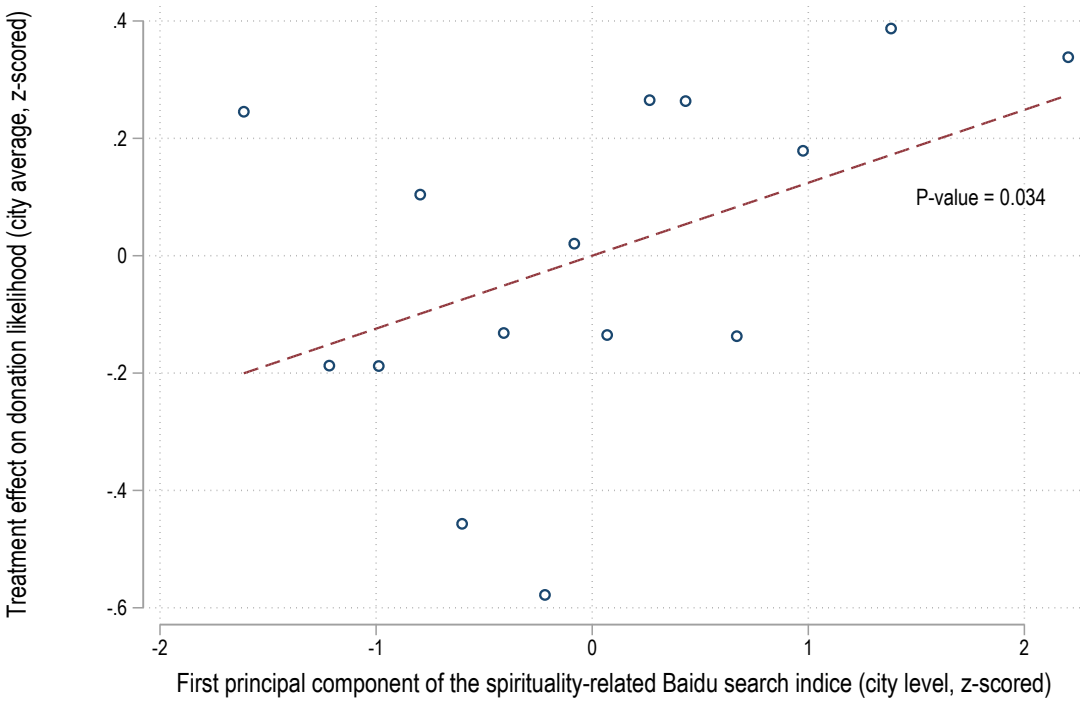


(b) Effect on Donation Amount (Donated)



Note: This figure illustrates the estimated average treatment effects in the field experiment on Platform X. For the treatment group of potential donors, a phrase (”do good deeds and get blessings”) was added below the donation button in the campaign page on this online donation platform, while the page stays unchanged for the control group. The left and right panels show the average treatment effects on donation ratio and donation amount respectively. The right panel, “Donate Amount (Donated)”, denotes the amount the user gave to the campaign if the user donated. Comparisons between the treated and control are described on the top of each panel, with relative change ratios, average treatment effects, and p-values and 95% confidence intervals for the average treatment effects. The error bars are 95% confidence intervals around the sample group averages.

Figure 4: The Field Experiment: The Relationship between Heterogeneous Treatment Effects and Regional Variations in Spirituality-related Search Activities



Note: The figure illustrates how the treatment effects in the field experiment is positively related at the city-level with web search activity of keywords that traditionally signify a belief in fate being influenced by supernatural forces and are associated with spiritual narratives. Both the dependent variable and the independent variable are z-scored. The dots are produced through a binscatter procedure. The linear fit line corresponds to the regression result in Table 7.

Table 1: Summary Statistics

Number of individuals					74,023
Number of quarters					8
Number of observations					592,184
Non-zero fraction of donation					1.46%
Non-zero fraction of religious donation					0.89%
Non-zero fraction of secure donation					0.61%
Non-zero fraction of insurance					13.44%
Non-zero fraction of health expenditure					6.54%
	Mean	Std. dev.	25th pct.	Median	75th pct.
Income	\$4,067	\$30,867	\$1,478	\$2,200	\$3,867
Financial wealth	\$13,600	\$35,667	\$894	\$3,500	\$12,667
Total donation (non-zero)	\$97.10	\$95.85	\$50.00	\$80.00	\$100.00
Religious donation (non-zero)	\$94.39	\$102.60	\$50.00	\$70.00	\$100.00
Secular donation (non-zero)	\$94.40	\$72.54	\$50.00	\$83.33	\$100.00
Insurance (non-zero)	\$905.07	\$6,143.89	\$266.67	\$433.33	\$657.57
Health expenditure (non-zero)	\$72.56	\$207.33	\$18.00	\$33.33	\$66.67
Age	36.53	6.99	31	36	41
$\hat{\sigma}$	0.42	0.17	0.30	0.41	0.54
$\hat{\sigma}^{\text{pos}}$	0.32	0.13	0.22	0.30	0.40
$\hat{\sigma}^{\text{neg}}$	0.25	0.11	0.17	0.24	0.32
Gender	Female				
	0.46				
Marriage status	Married				
	0.32				
Education	Masters and above		Undergraduate		Vocational school
	0.14		0.38		0.20
	High school and below				
	0.29				
Job position	Public sector officers		Agricultural workers		Blue-collar workers
	0.02		0.00		0.31
	White-collar workers		Service-sector workers		Executives
	0.52		0.04		0.08
	Owner-managers		Others		
	0.01		0.02		
Dependents	No dependent		One dependent		Two dependents
	0.87		0.05		0.07
	Three or more				
	0.01				

Notes: This table presents the summary statistics for the sample at the individual-quarter level. Income is the average monthly payroll receipt during the quarter. Financial wealth is measured as the sum of the value of saving, bond, fund, and stocks net of debt. Donations include donations to secular and religious charities. Insurance is spending on life insurance and private health insurance. Health expenditure is defined as spending on medical care. The means, standard deviations, and quantiles of donation, health expenditure, and insurance are conditional on the corresponding variable being non-zero. $\hat{\sigma}$ is the income uncertainty measure, computed as the standard deviation of all monthly income realizations over the preceding four quarters, after removing predictable income components. $\hat{\sigma}^{\text{neg}}$ ($\hat{\sigma}^{\text{pos}}$) retains only the negative (positive) component of the unpredicted income realizations when computing the income uncertainty measure. All currency units are converted to USD at the exchange rate.

Table 2: Income Uncertainty Predicts Donation

Panel A: Probability of donation $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Pr(donation$_{t+1}$)			
Specification	OLS	OLS	OLS	IV	IV	IV
Income uncertainty$_t$	0.70%***	0.70%***	0.70%***	1.86%***	1.92%***	1.90%***
	(0.06%)	(0.06%)	(0.06%)	(0.56%)	(0.59%)	(0.60%)
Income$_t$		-0.02%	0.02%		0.07%	0.07%
		(0.03%)	(0.03%)		(0.05%)	(0.06%)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	403.0	394.0	378.8
R^2-Adjusted	0.384	0.384	0.384	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
City × quarter FE	NO	NO	YES	NO	YES	YES
Panel B: Donation amount $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Donation amount$_{t+1}$			
Specification	OLS	OLS	OLS	IV	IV	IV
Income uncertainty$_t$	0.53***	0.52***	0.52***	2.09***	2.17***	2.13***
	(0.06)	(0.06)	(0.06)	(0.77)	(0.81)	(0.83)
Income$_t$		0.01	0.02		0.12*	0.12
		(0.06)	(0.06)		(0.07)	(0.07)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	403.0	394.0	378.8
R^2-Adjusted	0.402	0.402	0.402	/	/	/
Uncond. Mean(Dona. Amt$_{t+1}$)	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
City × quarter FE	NO	NO	YES	NO	YES	YES

Notes: This table reports estimates of regressions where within-person variations in income uncertainty predict the likelihood and amount of donations. The dependent variable is the next-quarter likelihood to donate in Panel A and the next-quarter donation amount in Panel B. The main independent variable of interest, income uncertainty, is the standard deviation of the unpredicted component of all realized log monthly payroll income in the last four quarters. Columns (1)-(3) report OLS estimates. Columns (4)-(6) report instrumental variable estimates, where individual-level income uncertainty is instrumented by the firm-level leave-one-out average of income uncertainty. Control variables are log income, log financial wealth, and demographic variables that include age, age squared, education, occupation, marital status, and number of dependents. Standardized coefficients are reported for continuous dependent variables. Full set of coefficients are reported in Online Appendix Table A.1. All currency units are converted to USD. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table 3: Income Uncertainty Predicts Donation: Religious Charities and Negative Uncertainty

Panel A: Probability of donation $(t+1)$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable				Pr(donation$_{t+1}$)				
Charity type	Religious	Secular	Religious	Secular	Religious	Secular	Religious	Secular
Specification	OLS	OLS	OLS	OLS	IV	IV	IV	IV
Income	0.47%***	0.24%***			1.23%***	0.64%		
uncertainty$_t$	(0.04%)	(0.04%)			(0.45%)	(0.40%)		
Positive			0.19%***	0.09%***			0.36%	0.17%
uncertainty$_t$			(0.03%)	(0.02%)			(0.23%)	(0.20%)
Negative			0.27%***	0.15%***			1.06%*	0.39%
uncertainty$_t$			(0.05%)	(0.04%)			(0.55%)	(0.47%)
Observations	296,092	296,092	296,092	296,092	273,616	273,616	273,616	273,616
First-stage F-stat.	/	/	/	/	378.8	378.8	159.7	159.7
R^2-Adjusted	0.382	0.383	0.382	0.383	/	/	/	/
Mean Pr(Donation$_{t+1}$)	0.89%	0.61%	0.89%	0.61%	0.89%	0.61%	0.89%	0.61%
Cond. Mean(Dona. Amt$_{t+1}$)	$94.39	$94.40	$94.39	$94.40	$94.39	$94.40	$94.39	$94.40
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES	YES	YES
Panel B: Donation amount $(t+1)$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable				Donation amount$_{t+1}$				
Charity type	Religious	Secular	Religious	Secular	Religious	Secular	Religious	Secular
Specification	OLS	OLS	OLS	OLS	IV	IV	IV	IV
Income	0.32***	0.21***			1.40**	0.73*		
uncertainty$_t$	(0.04)	(0.04)			(0.71)	(0.43)		
Positive			0.13***	0.07***			0.36	0.23
uncertainty$_t$			(0.02)	(0.03)			(0.33)	(0.21)
Negative			0.19***	0.14***			1.27*	0.35
uncertainty$_t$			(0.05)	(0.04)			(0.77)	(0.50)
Observations	296,092	296,092	296,092	296,092	273,616	273,616	273,616	273,616
First-stage F-stat.	/	/	/	/	378.8	378.8	159.7	159.7
R^2-Adjusted	0.368	0.444	0.368	0.444	/	/	/	/
Uncond. Mean(Dona. Amt$_{t+1}$)	$0.84	$0.58	$0.84	$0.58	$0.84	$0.58	$0.84	$0.58
Cond. Mean(Dona. Amt$_{t+1}$)	$94.39	$94.40	$94.39	$94.40	$94.39	$94.40	$94.39	$94.40
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: This table reports estimates of regressions where within-person variations in income uncertainty predict the likelihood and amount of donations to religious charities and donations to secular charities. The dependent variable is the next-quarter likelihood to donate in Panel A and the next-quarter donation amount in Panel B for the respective charity type. The main independent variables of interest include income uncertainty, as the standard deviation of the unpredicted component of all realized log monthly payroll income in the last four quarters, and positive income uncertainty and negative income uncertainty, as constructed using the semi-variance approach. Columns (1)-(4) report OLS estimates. Columns (5)-(8) report instrumental variable estimates, where individual-level (positive, negative) income uncertainty is instrumented by the firm-level leave-one-out average of (positive, negative) income uncertainty. Control variables are log income, log financial wealth, and demographic variables that include age, age squared, education, occupation, marital status, and number of dependents. Standardized coefficients are reported for continuous dependent variables. Full set of coefficients are reported in Online Appendix Table A.3. All currency units are converted to USD. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table 4: Health Shocks Predicts Donation: Religious Charities and Secular Charities

Panel A: Probability of donation $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Pr(donation$_{t+1}$)			
Charity type	All	Religious	Secular	All	Religious	Secular
Health shock occurrence$_t$	3.94%***	3.15%***	0.85%***			
	(0.25%)	(0.21%)	(0.14%)			
Health shock amount$_t$				0.76%***	0.61%***	0.16%***
				(0.21%)	(0.17%)	(0.05%)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.387	0.386	0.383	0.385	0.384	0.383
Mean Pr(Donation$_{t+1}$)	1.46%	0.89%	0.61%	1.46%	0.89%	0.61%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$94.39	\$94.40	\$97.10	\$94.39	\$94.40
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES
Panel B: Donation amount $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Donation amount$_{t+1}$			
Charity type	All	Religious	Secular	All	Religious	Secular
Health shock occurrence$_t$	2.08***	1.98***	0.11			
	(0.23)	(0.20)	(0.12)			
Health shock amount$_t$				0.44***	0.42***	0.02
				(0.13)	(0.12)	(0.02)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.402	0.369	0.443	0.402	0.369	0.443
Uncond. Mean(Dona. Amt$_{t+1}$)	\$1.42	\$0.84	\$.58	\$1.42	\$0.84	\$0.58
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$94.39	\$94.40	\$97.10	\$94.39	\$94.40
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES

Notes: This table reports the estimates of regressions where within-person variations in health shocks predict the likelihood and amount of donations to all charities, to religious charities, and to secular charities. The dependent variable is the quarter $t+1$ likelihood to donate in Panel A and the donation amount in Panel B for the respective charity type. The main independent variable of interest, health shock occurrence, is defined as the dummy of incurring medical expenditures in quarter t that are above the median of the sample in Columns (1)-(3), and as the amount spent on medical expenditures in quarter t that are above the median of the sample in Columns (4)-(6). Control variables and fixed effects are the same as in Table 2. Standardized coefficients are reported for continuous dependent variables. The full set of coefficients are reported in Online Appendix Table A.4. All currency units are converted to USD. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table 5: Donation Associated with Reduction in Contemporaneous Insurance Expenditures

Panel A: Whether donated in the same quarter $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Insurance expenditures$_{t+1}$ ($)					
Charity type	All	Religious	Secular	All	Religious	Secular
Donation dummy$_{t+1}$	-80.40***	-98.67***	-54.08	7.06	14.82	0.14
	(25.76)	(32.58)	(37.90)	(37.03)	(48.70)	(52.96)
Income uncertainty$_t$ ×				-97.68**	-125.25**	-60.19
Donation dummy$_{t+1}$				(42.77)	(58.79)	(52.98)
Income uncertainty$_t$	86.58***	86.47***	86.14***	88.09***	87.66***	86.52***
	(19.64)	(19.63)	(19.62)	(19.83)	(19.75)	(19.69)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Mean(Insur. exp.$_{t+1}$)	$242.01	$242.01	$242.01	$242.01	$242.01	$242.01
Control variables	YES	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES	YES	YES
Panel B: Donation amount in the same quarter $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Insurance expenditures$_{t+1}$ ($)					
Charity type	All	Religious	Secular	All	Religious	Secular
Donation amount$_{t+1}$	-6.26*	-6.38**	-1.98	0.97	0.14	1.50
	(3.31)	(3.12)	(3.82)	(3.68)	(3.54)	(3.93)
Income uncertainty$_t$ ×				-7.74**	-7.19**	-3.58
Donation amount$_{t+1}$				(3.68)	(3.54)	(3.93)
Income uncertainty$_t$	86.23***	86.19***	86.05***	86.17***	86.14***	86.03***
	(19.62)	(19.61)	(19.62)	(19.62)	(19.61)	(19.62)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Mean(Insur. exp.$_{t+1}$)	$242.01	$242.01	$242.01	$242.01	$242.01	$242.01
Control variables	YES	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES	YES	YES

Notes: This table reports estimates of regressions examining the contemporaneous association between donations and insurance expenditures using within-person variations in insurance spending, donations, and income uncertainty. The dependent variable is the insurance expenditures in quarter $t+1$. In columns (1)-(3) of Panel A, the main independent variables of interest are a donation dummy for donating to the corresponding type of charities in quarter $t+1$, and income uncertainty, as the standard deviation of the unpredicted component of all realized log monthly payroll income in the last four quarters up to quarter t. In columns (4)-(6) of Panel A, the interaction of income uncertainty$_t$ and donation dummy$_{t+1}$ is further added. In Panel B, donation dummy$_{t+1}$ is replaced with donation amount$_{t+1}$, the amount donated to the corresponding type of charities in quarter $t+1$. Control variables and fixed effects are the same as in Table 2. Standardized coefficients are reported for continuous dependent variables. Full set of coefficients are reported in Online Appendix Table A.5. All currency units are converted to USD. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table 6: "Self-fulfilling Hypothesis"? Donation Does Not Predict Reduction in Uncertainty

Panel A: Whether donated in the first half of the sample ($year = 1$)			
	(1)	(2)	(3)
Dependent variable	Income uncertainty$_{year=2}$		
Charity type	All	Religious	Secular
Donation dummy$_{year=1}$	0.04	0.04	0.06
	(0.03)	(0.04)	(0.04)
Income uncertainty$_{year=1}$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Observations	74,023	74,023	74,023
R^2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES
Panel B: Donation amount in the first half of the sample ($year = 1$)			
	(1)	(2)	(3)
Dependent variable	Income uncertainty$_{year=2}$		
Charity type	All	Religious	Secular
Donation amount$_{year=1}$	0.00	-0.01	0.01
	(0.05)	(0.09)	(0.10)
Income uncertainty$_{year=1}$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Observations	74,023	74,023	74,023
R^2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES

Notes: This table reports estimates of regressions examining the association between donation and future income uncertainty. The dependent variable is individual income uncertainty in the second half of the sample ($year = 2$), measured as the standard deviation of the unpredicted component of all realized log monthly payroll income in the second year of the two-year sample. In panel A, the independent variables of interest are a donation dummy for donating to the corresponding type of charities in $year = 1$, the first year of the two-year sample, and income uncertainty in $year = 1$. In panel B, donation dummy$_{year=1}$ is replaces with donation amount$_{year=1}$, the amount donated to the corresponding type of charities in $year = 1$. Control variables include log income in $year = 1$, log financial wealth in $year = 1$, and demographic variables that include age, age squared, educational attainment, occupational type, marital status, and the number of dependents. Standardized coefficients are reported for continuous dependent variables. Full set of coefficients are reported in Online Appendix Table A.11. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table 7: Field Experiment: Heterogeneous Treatment Effects Associated with Regional Variations in Spirituality-related Search Activities

Dependent variables	(1) Per-capita donations (city-level)	(2) Per-capita donations (city-level)	(3) Treatment effect (city average)	(4) Treatment effect (city average)
First principal component of the	3363.303***	2488.144***	0.124**	0.174**
spirituality-related Baidu search indices	(573.835)	(822.926)	(0.058)	(0.068)
Per capita gross regional product		-1563.145		-0.094
		(1062.327)		(0.128)
Per capita retail sales		2524.516**		0.033
		(1027.773)		(0.108)
Per capita public expenditure		226.497		-0.070
		(1125.434)		(0.154)
Per capita public expenditure		-1219.129		0.112
(science and technology)		(812.559)		(0.095)
Per capita public expenditure		2024.067**		0.044
(education)		(941.841)		(0.170)
Coverage of urban employee basic		-678.432		0.029
pension		(709.608)		(0.112)
Coverage of urban employee public		-889.344		-0.074
health insurance		(863.603)		(0.152)
Coverage of urban employee		3006.966**		-0.037
unemployment insurance		(1233.060)		(0.138)
Constant	9698.963***	9698.963***	0.000	0.000
	(411.554)	(372.528)	(0.058)	(0.059)
Observations	290	290	290	290
R-squared	0.188	0.353	0.015	0.027

Note: This table reports the relationship between heterogeneous treatment effects in the field experiment and regional variations in spirituality-related search activities. For the treatment group of potential donors, a phrase (”do good deeds and get blessings”) was added below the donation button in the campaign page on this online donation platform, while the page stays unchanged for the control group. The prefectural-city level average treatment effects and the right-hand-side variables in all columns are z-scored. The prefectural-city level total donations on Platform X is normalized by population. Heteroskedasticity-consistent standard errors are reported beneath the estimated coefficient within parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

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Hedging by Giving: Spiritual Insurance and Religious Donations

Online Appendix

A. Proofs of Lemmas and Propositions

We provide proofs of the Lemmas and Propositions in the paper in this appendix section.

A.1 Optimal Donations without Spiritual Insurance Motive

In the model without a spiritual insurance channel, the objective function is:

$$\max_g (1-2p)u(\bar{I}-g) + pu(\bar{I}-g-D) + pu(\bar{I}-g+D) + \theta v(g) \tag{A.1}$$

The first order condition (FOC) is as follow:

$$-(1-2p)u'(\bar{I}-g) - pu'(\bar{I}-g-D) - pu'(\bar{I}-g+D) + \theta v'(g) = 0 \tag{A.2}$$

The second order condition (SOC) is satisfied:

$$(1-2p)u''(\bar{I}-g) + pu''(\bar{I}-g-D) + pu''(\bar{I}-g+D) + \theta v''(g) < 0 \tag{A.3}$$

To consider the comparative statics of optimal donations g^* with respect to expected income $\bar{I}$, rewrite g^* as $g^*(\bar{I}, D)$, and denote $g^*_{\bar{I}}(\bar{I}, D) = \frac{dg^*(\bar{I},D)}{d\bar{I}}$. Taking the derivative of the FOC with respect to $\bar{I}$ gives rise to the following relationship:

$$g^*_{\bar{I}}(\bar{I}, D) = \frac{(1-2p)u''(\bar{I}-g) + pu''(\bar{I}-g-D) + pu''(\bar{I}-g+D)}{(1-2p)u''(\bar{I}-g) + pu''(\bar{I}-g-D) + pu''(\bar{I}-g+D) + \theta v''(g)} > 0 \tag{A.4}$$

Both the numerator and the denominator are negative because the utility function u is concave. Therefore, the income effect on donations in the model without a spiritual insurance motive is positive.

Then consider the comparative statics of optimal donations g^* with respect to the size of the background risk D. Denote $g^*_D(\bar{I}, D) = \frac{dg^*(\bar{I},D)}{dD}$, the derivative of the FOC with respect to D. We have the following relationship:

$$g^*_D(\bar{I}, D) = \frac{pu''(\bar{I}-g+D) - pu''(\bar{I}-g-D)}{(1-2p)u''(\bar{I}-g) + pu''(\bar{I}-g-D) + pu''(\bar{I}-g+D) + \theta v''(g)} < 0 \tag{A.5}$$

The denominator in (A.5) is inherited from the previous equation and is negative. The numerator in (A.5) is positive because $u''' > 0$. Therefore, the effect of the size of income uncertainty on donations in the model without a spiritual insurance motive is negative.

This ends the proof for Lemma 1, that is, in the model without a spiritual insurance motive, if expected income $\bar{I}$ rises, the optimal donation size g^* rises, and if the size of income uncertainty D rises, the optimal donation size g^* falls. In the model without a spiritual insurance motive, donation is a normal good, and shares the findings on uncertainty and consumption of normal goods in Kimball (1990).

A.2 Optimal Donations with Spiritual Insurance Motive

We next assume a spiritual insurance motive exists and derive testable implications. The objective function of the individual's optimal donation problem with a spiritual insurance motive is:

$$\max_g (1-2\bar{p})u(\bar{I}-g) + (\bar{p}-\pi(g))u(\bar{I}-g-D) + (\bar{p}+\pi(g))u(\bar{I}-g+D) + \theta v(g) \tag{A.6}$$

The FOC of the optimal donation problem is now as follows:

$$\begin{gathered}\pi'(g)[u(\bar{I}-g+D) - u(\bar{I}-g-D)] + \theta v'(g) = \\ (1-2\bar{p})u'(\bar{I}-g) + (\bar{p}-\pi(g))u'(\bar{I}-g-D) + (\bar{p}+\pi(g))u'(\bar{I}-g+D)\end{gathered} \tag{A.7}$$

On the left-hand side of (A.7), the term $\pi'(g)[u(\bar{I}-g+D) - u(\bar{I}-g-D)]$ specifically represents the (subjective) marginal benefit from spiritual insurance, and, as before, the next term $\theta v'(g)$ is the marginal benefit of donating not from spiritual insurance. The right-hand side of (A.7) is the expected marginal cost of donating g. The optimal decision balances the marginal benefits and the marginal costs of donation.

Consider an increase in the size of income uncertainty D in the above model with a spiritual insurance motive. First, the marginal benefit of donating from spiritual insurance increases because the scaling factor $u(\bar{I}-g+D) - u(\bar{I}-g-D)$ is higher. Second, the marginal cost of donating also increases through a canonical income effect, as in the model without spiritual insurance. Third, the spiritual insurance channel dampens this canonical income effect of D by shifting subjective belief from the bad state, where the income effect of D is malevolent, to the good state, where the income effect of D is benevolent. Combined, in the model with spiritual insurance, if the spiritual insurance motive is sufficiently strong——strong enough to counterbalance the opposing income effect——then the optimal donation g^* will increase in the size of income uncertainty D.

We formally establish the above statement in the proof below.

Proof of Proposition 1.

To initiate the proof, first examine the condition under which the second-order condition (SOC) of the optimal donation problem in the model with a spiritual insurance motive holds. Taking

the second derivative of the objective function, the SOC amounts to the following condition:

$$\begin{aligned}&\pi''(g)(u(\bar{I}-g+D)-u(\bar{I}-g-D))+\theta v''(g)+(1-2\bar{p})u''(\bar{I}-g)+\\&(\bar{p}-\pi(g))u''(\bar{I}-g-D)+(\bar{p}+\pi(g))u''(\bar{I}-g+D)-\\&2\pi'(g)\left(u'(\bar{I}-g+D)-u'(\bar{I}-g-D)\right)<0\end{aligned} \tag{A.8}$$

In Equation (A.8), all terms are negative except the final one. In an extreme scenario where this final term is dominant, the optimal donation amount would lead to what we term 'complete spiritual insurance'—effectively reducing the subjective probability of experiencing the low state to zero. This represents a corner solution in our model. However, when the subjective probability return function $\pi(\cdot)$ and/or utility function $u(\cdot)$ exhibit sufficient curvature, a different outcome emerges. This curvature ensures the satisfaction of the second-order condition, implying diminishing returns from the spiritual insurance benefits of donations. Under this more typical scenario, which we focus on henceforth, the subjective probability of the low-income state remains above zero post-donation, and the optimal donation problem adopts an interior solution.

Then, to analyze the comparative statics of optimal donation g^* with respect to expected income $\bar{I}$ and background risk D in the model with a spiritual insurance motive, we rewrite g^* as $g^*(\bar{I},D)$, and take derivative of the FOC with respect to $\bar{I}$ and D:

$$\begin{aligned}&g_I^*(\bar{I},D)\left[\pi''(g)(u(\bar{I}-g+D)-u(\bar{I}-g-D))+\theta v''(g)+\right.\\&(1-2\bar{p})u''(\bar{I}-g)+(\bar{p}-\pi(g))u''(\bar{I}-g-D)+\\&\left.(\bar{p}+\pi(g))u''(\bar{I}-g+D)-2\pi'(g)\left(u'(\bar{I}-g+D)-u'(\bar{I}-g-D)\right)\right]\\&=(1-2\bar{p})u''(\bar{I}-g)+(\bar{p}-\pi(g))u''(\bar{I}-g-D)+\\&(\bar{p}+\pi(g))u''(\bar{I}-g+D)-\pi'(g)\left(u'(\bar{I}-g+D)-u'(\bar{I}-g-D)\right)\end{aligned} \tag{A.9}$$

$$\begin{aligned}&g_D^*(\bar{I},D)\left[\pi''(g)(u(\bar{I}-g+D)-u(\bar{I}-g-D))+\theta v''(g)+\right.\\&(1-2\bar{p})u''(\bar{I}-g)+(\bar{p}-\pi(g))u''(\bar{I}-g-D)+\\&\left.(\bar{p}+\pi(g))u''(\bar{I}-g+D)-2\pi'(g)\left(u'(\bar{I}-g+D)-u'(\bar{I}-g-D)\right)\right]\\&=-\pi'(g)\left(u'(\bar{I}-g+D)+u'(\bar{I}-g-D)\right)+\\&(\bar{p}+\pi(g))u''(\bar{I}-g+D)-(\bar{p}-\pi(g))u''(\bar{I}-g-D)\end{aligned} \tag{A.10}$$

Notice that the terms in the brackets on the left side of both equations are exactly the terms in the SOC. Thus, the mathematical conditions for $g_I^*(\bar{I},D)>0$ and $g_D^*(\bar{I},D)>0$ are the conditions

below:

$$g_I^*(\bar{I},D)>0 \text{ if } (1-2\bar{p})u''(\bar{I}-g)+(\bar{p}-\pi(g))u''(\bar{I}-g-D)+ \\ (\bar{p}+\pi(g))u''(\bar{I}-g+D)-\pi'(g)\left(u'(\bar{I}-g+D)-u'(\bar{I}-g-D)\right)<0 \tag{A.11}$$

$$g_D^*(\bar{I},D)>0 \text{ if } \pi'(g)\left(u'(\bar{I}-g+D)+u'(\bar{I}-g-D)\right) \\ >(\bar{p}-\pi(g^*))\left(-u''\left(\bar{I}-g^*-D\right)\right)+(\bar{p}+\pi(g^*))u''\left(\bar{I}-g^*+D\right) \tag{A.12}$$

The condition (A.11) for $g_I^*(\bar{I},D)>0$ is similar to the technical requirement for the second-order condition (A.8), that is, that the spiritual insurance channel should not be so extreme that the corner case of complete spiritual insurance occurs and the conventional income effect does not exist.

More central is the condition (A.12) for $g_D^*(\bar{I},D)>0$, which has clear economic interpretations. On the left-hand side, $\pi'(g)(u'(\bar{I}-g+D)+u'(\bar{I}-g-D))$ is the additional benefit of donations through the spiritual insurance channel, when D increases by one, as the low-state marginal utility is now higher and the high-state marginal utility is now lower. On the right-hand side, $(\bar{p}-\pi(g^*))(-u''(\bar{I}-g^*-D))+(\bar{p}+\pi(g^*))u''(\bar{I}-g^*+D)$ is the additional increase in the expected marginal utility of foregone consumption with the increase in D, which is the income effect of higher income uncertainty that tends to reduce donations, and also exists in the model without spiritual insurance. If the left-hand side is greater than the right-hand side, that is, if the spiritual insurance channel is strong enough, the model with spiritual insurance predicts that

$$\frac{\partial g^*}{\partial D}>0,$$

that is, when the size of income uncertainty D increases, optimal donation g^* rises. This conclusion contrasts with the model where the spiritual insurance motive is not a consideration.

This ends the proof of Proposition 1.

The condition (A.12) that makes the spiritual insurance motive dominate is not difficult to reach. We use a numerical example to illustrate this. We choose the same functional forms as in Auriol et al. (2020). We use a constant absolute risk aversion (CARA) utility function, i.e., $u(c)=1-\exp\{-ac\}$. The magnitude to which the perceived probability of the bad state $\bar{p}-\pi(g)$ is reduced as an individual donates is specified as $\pi(g)=k\cdot\ln(g+1)$. The parameter k governs the relative ease with which the perceived probability is changed. We choose $\bar{I}=10$ following Auriol et al. (2020). We choose $D=4.27$ and $\bar{p}=0.39$ to match the average income uncertainty of $\log$ monthly income of 0.427 in the dataset. The value of g is chosen to match the ratio of the conditional average monthly donation size to average income ($\$46/\$4067$), which gives $g=0.11$. We then examine whether condition (2) in the paper, that is, condition (A.12) here, holds under different values of the coefficient of absolute risk aversion a and the parameter k.

We vary the utility exponent (a) from 0 to 1.0, corresponding to a relative risk aversion (RRA) range of 0 to 10 at a mean income of $\bar{I}=10$. Similarly, we adjust the subjective probability return coefficient k within a range that aligns the ratio of perceived probability reduction relative to the

objective probability ($\pi(g)/\bar{p}$), when the donation size (g) equals the sample average, to a span of 0 to 1.0.

Figure A.1: Numerical Example of Parameter Ranges that Satisfy Condition (2)

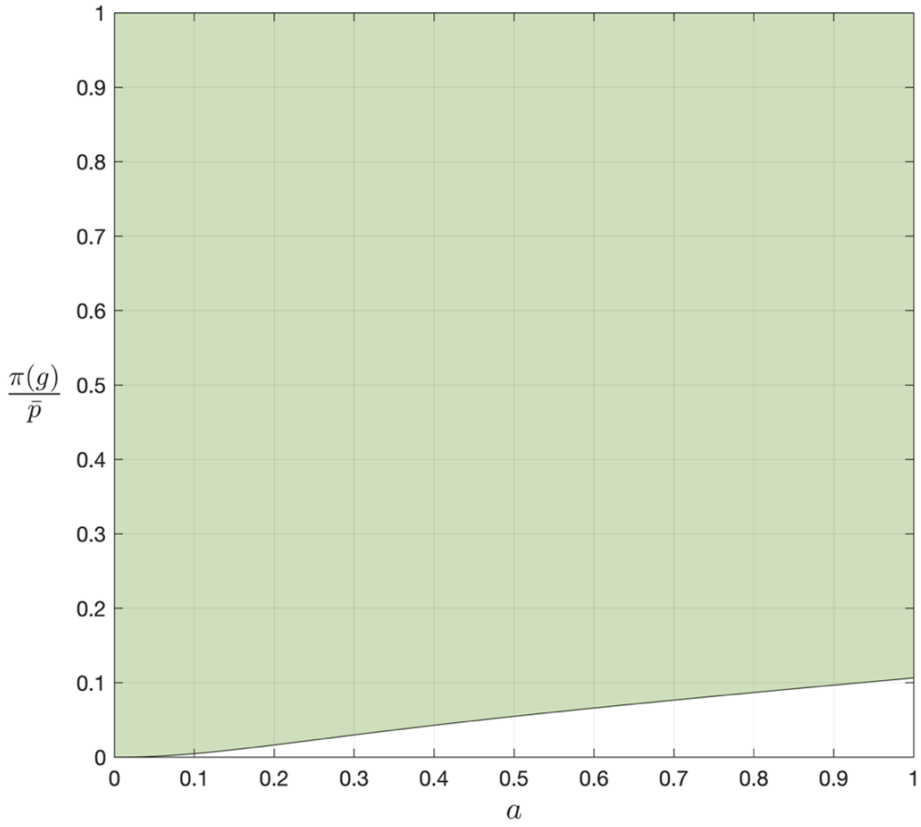

Figure A1 presents our findings, showing the parameter combinations of a and k where condition (2) in the paper, that is, condition (A.12) holds true. Overall, we observe that condition (2) is met in 94.7% of the parameter pairs examined. Notably, a higher subjective probability return coefficient (k), or a greater perceived probability reduction ($\pi(g)/\bar{p}$), increases the likelihood of satisfying the condition. This aligns with expectations, considering that $\pi(g)/\bar{p}$ indicates the efficacy of the spiritual insurance channel. Conversely, an increase in a reduces the probability of meeting the condition, likely due to the amplified income effect from greater income uncertainty at higher levels of risk aversion. Nevertheless, even at the highest risk aversion in our range (RRA of 10), condition (A.12) is predominantly satisfied, holding true 89% of the time.

A.3 Optimal Donations with Two-Dimensional Risks

In this appendix section, we expand our model to include two distinct dimensions of risk: income risk ($\tilde{I}$) and insurable expense risk ($\tilde{E}$). As in our initial model, income risk remains uninsurable and its perceived probability distribution is modified by the spiritual insurance channel.

In contrast, the expense risk, which occurs with probability q, introduces a new element as it can be hedged through market-based insurance.

Agents in our model are provided with the option to purchase a portion (α) of this market-based insurance at a cost of $\alpha(1+\lambda)qE$. This insurance compensates for a fraction (α) of the losses incurred from the expense risk. The coefficient λ, representing the premium loading factor—a concept well-established in the insurance literature (e.g. Eeckhoudt and Schlesinger, 2013)—is inherently non-negative. It essentially denotes the additional cost over the expected loss that the insurance company charges for providing the coverage.

By extending the model in this manner, our objective is to explore the relationship between donations and the purchase of market-based insurance as agents navigate two types of risks—uninsurable income risk and insurable expense risk—within the same economic framework. To analyse this model relationship, we proceed to detail the agent's objective function as follows:

$$\begin{aligned}
\max_{g,\alpha} \quad & q[(1-2\bar{p})u(\bar{I}-g-(1-\alpha)E-\alpha(1+\lambda)qE) \\
& +(\bar{p}-\pi(g))u(\bar{I}-g-D-(1-\alpha)E-\alpha(1+\lambda)qE) \\
& +(\bar{p}+\pi(g))u(\bar{I}-g+D-(1-\alpha)E-\alpha(1+\lambda)qE)] \\
& +(1-q)[(1-2\bar{p})u(\bar{I}-g-\alpha(1+\lambda)qE) \\
& +(\bar{p}-\pi(g))u(\bar{I}-g-D-\alpha(1+\lambda)qE) \\
& +(\bar{p}+\pi(g))u(\bar{I}-g+D-\alpha(1+\lambda)qE)] \\
& +\theta v(g) \\
\equiv\ & \mathbb{E}_{\tilde{I}}\mathbb{E}_{\tilde{E}}u(\tilde{I}-g-(1-\alpha)\tilde{E}-\alpha(1+\lambda)qE)+\theta v(g)
\end{aligned} \tag{A.13}$$

where donation g and the purchase of market-based insurance α are the agent's two choice variables.

We obtain the following the first-order conditions for g and α, where $y_0(\alpha)$ short-hands for $\bar{I}-\alpha(1+\lambda)qE$, and $y_1(\alpha)$ short-hands for $\bar{I}-(1-\alpha)E-\alpha(1+\lambda)qE$:

$$\begin{aligned}
[g]: \quad & \pi'(g)\left\{q\left[u\left(y_1(\alpha)-g+D\right)-u\left(y_1(\alpha)-g-D\right)\right]+\right. \\
& \left.(1-q)\left[u\left(y_0(\alpha)-g+D\right)-u\left(y_0(\alpha)-g-D\right)\right]\right\}+\theta v'(g)= \\
& q\left[(\bar{p}+\pi(g))u'\left(y_1(\alpha)-g+D\right)+(\bar{p}-\pi(g))u'\left(y_1(\alpha)-g-D\right)\right. \\
& \left.+(1-2\bar{p})u'\left(y_1(\alpha)-g\right)\right]+(1-q)\left[(1-2\bar{p})u'\left(y_0(\alpha)-g\right)+\right. \\
& \left.(\bar{p}+\pi(g))u'\left(y_0(\alpha)-g+D\right)+(\bar{p}-\pi(g))u'\left(y_0(\alpha)-g-D\right)\right]
\end{aligned} \tag{A.14}$$

$$
\begin{aligned}
[\alpha]: \quad & q\left(1-(1+\lambda)q\right)E\cdot\left[(1-2\bar{p})u'\left(y_1(\alpha)-g\right)\right. \\
& \left.(\bar{p}+\pi(g))u'\left(y_1(\alpha)-g+D\right)+(\bar{p}-\pi(g))u'\left(y_1(\alpha)-g-D\right)\right] \\
& =(1-q)(1+\lambda)qE\cdot\left[(1-2\bar{p})u'\left(y_0(\alpha)-g\right)\right. \\
& \left.(\bar{p}+\pi(g))u'\left(y_0(\alpha)-g+D\right)+(\bar{p}-\pi(g))u'\left(y_0(\alpha)-g-D\right)\right]
\end{aligned}
\tag{A.15}
$$

The FOC for g equates the spiritual insurance and non-spiritual insurance benefits of donation versus the expected utility of the forgone consumption. The FOC for α balances the marginal utilities of the claim and the non-claim states considering the premium of and compensations from the purchased insurance. Significantly, the first-order conditions for donation and the purchase of market-based insurance are interconnected via the spiritual insurance channel: donation reduces the perceived probability of the low-income state where the insurance compensation is especially beneficial, and the insurance purchase, in turn, affects the value of modifying the probability distribution of the income risk.

The second-order condition for the insurance variable α follows trivially. For the donation variable (g), the second-order condition is confirmed by substituting the term u in condition (A.8) with $\mathrm{E}_{\tilde{E}}u(\cdot)$.

Then, we conduct a comparative static analysis. This leads to the main result from the extended model with two-dimensional risks, summarized in the following proposition:

Proposition 2 *If the spiritual insurance motive for donations is strong enough, i.e.,*

$$
\begin{aligned}
& q\cdot\left[1-(1+\lambda)q\right]\cdot\left\{\pi'(g)\left[u'\left(y_1(\alpha)-g-D\right)-u'\left(y_1(\alpha)-g+D\right)\right]\right. \\
& -\left[(\bar{p}+\pi(g))(-u''\left(y_1(\alpha)-g+D\right))+(\bar{p}-\pi(g))(-u''\left(y_1(\alpha)-g-D\right))\right. \\
& \left.\left.+(1-2\bar{p})(-u''\left(y_1(\alpha)-g\right))\right]\right\} \\
& -(1-q)\cdot\left[(1+\lambda)q\right]\cdot\left\{\pi'(g)\left[u'\left(y_0(\alpha)-g-D\right)-u'\left(y_0(\alpha)-g+D\right)\right]\right. \\
& -\left[(\bar{p}+\pi(g))(-u''\left(y_0(\alpha)-g+D\right))+(\bar{p}-\pi(g))(-u''\left(y_0(\alpha)-g-D\right))\right. \\
& \left.\left.+(1-2\bar{p})(-u''\left(y_0(\alpha)-g\right))\right]\right\}>0
\end{aligned}
\tag{A.16}
$$

then donation g and insurance purchase α are negatively related, that is

$$
\frac{\partial g^*}{\partial \alpha}<0, \frac{\partial \alpha^*}{\partial g}<0
$$

Proof of Proposition 2.

Consider rewriting g^* as $g^*(\alpha)$. Upon differentiating (A.14) with respect to α, we obtain the fol-

lowing arithmetically tedious but straightforward relationship:

$$
\begin{aligned}
& g_\alpha^* \{(1-2\bar{p})\left[qu''\left(y_1(\alpha)-g\right)+(1-q)u''\left(y_0(\alpha)-g\right)\right] \\
& +(\bar{p}+\pi(g))\left[qu''\left(y_1(\alpha)-g+D\right)+(1-q)u''\left(y_0(\alpha)-g+D\right)\right] \\
& +(\bar{p}-\pi(g))\left[qu''\left(y_1(\alpha)-g-D\right)+(1-q)u''\left(y_0(\alpha)-g-D\right)\right] \\
& -2\pi'(g)\left[qu'\left(y_1(\alpha)-g+D\right)+(1-q)u'\left(y_0(\alpha)-g+D\right)\right. \\
& \left.-qu'\left(y_1(\alpha)-g-D\right)-(1-q)u'\left(y_0(\alpha)-g-D\right)\right]+ \\
& \pi''(g)\left[qu\left(y_1(\alpha)-g+D\right)+(1-q)u\left(y_0(\alpha)-g+D\right)\right. \\
& \left.-qu\left(y_1(\alpha)-g-D\right)-(1-q)u\left(y_0(\alpha)-g-D\right)\right]+\theta v''(g)\} \\
& =q\cdot[1-(1+\lambda)q]\cdot E\cdot\{\pi'(g)\left[u'\left(y_1(\alpha)-g-D\right)-u'\left(y_1(\alpha)-g+D\right)\right] \\
& -(\bar{p}+\pi(g))(-u''\left(y_1(\alpha)-g+D\right))-(\bar{p}-\pi(g))(-u''\left(y_1(\alpha)-g-D\right)) \\
& -(1-2\bar{p})(-u''\left(y_1(\alpha)-g\right))\} \\
& -(1-q)\cdot[(1+\lambda)q]\cdot E\cdot\{\pi'(g)\left[u'\left(y_0(\alpha)-g-D\right)-u'\left(y_0(\alpha)-g+D\right)\right] \\
& -(\bar{p}+\pi(g))(-u''\left(y_0(\alpha)-g+D\right))-(\bar{p}-\pi(g))(-u''\left(y_0(\alpha)-g-D\right)) \\
& -(1-2\bar{p})(-u''\left(y_0(\alpha)-g\right))\}
\end{aligned}
\tag{A.17}
$$

The expressions within the curly brackets on the left-hand side precisely match those in the second-order condition for g, thereby being less than zero. To establish $\frac{\partial g^*}{\partial \alpha} < 0$, it is sufficient for the right-hand side of this equation to be greater than zero, a condition that given $qE > 0$ is equivalent to condition (A.16).

In a similar vein, let us denote $\alpha_g^* = \frac{\partial \alpha^*}{\partial g}$ and differentiate (A.14) with respect to g:

$$\begin{aligned}
&\alpha_g^* \left\{ [1-(1+\lambda)q]^2 qE \cdot [(1-2\bar{p})u''(y_1(\alpha)-g) \right. \\
&+(\bar{p}+\pi(g))u''(y_1(\alpha)-g+D)+(\bar{p}-\pi(g))u''(y_1(\alpha)-g-D)] \\
&-[(1+\lambda)q]^2(1-q)E \cdot [(1-2\bar{p})u''(y_0(\alpha)-g) \\
&\left. +(\bar{p}+\pi(g))u''(y_0(\alpha)-g+D)+(\bar{p}-\pi(g))u''(y_0(\alpha)-g-D)] \right\} \\
&= q \cdot [1-(1+\lambda)q] \cdot E \cdot \{\pi'(g)[u'(y_1(\alpha)-g-D)-u'(y_1(\alpha)-g+D)] \\
&-(\bar{p}+\pi(g))(-u''(y_1(\alpha)-g+D))-(\bar{p}-\pi(g))(-u''(y_1(\alpha)-g-D)) \\
&-(1-2\bar{p})(-u''(y_1(\alpha)-g))\} \\
&-(1-q) \cdot [(1+\lambda)q] \cdot E \cdot \{\pi'(g)[u'(y_0(\alpha)-g-D)-u'(y_0(\alpha)-g+D)] \\
&-(\bar{p}+\pi(g))(-u''(y_0(\alpha)-g+D))-(\bar{p}-\pi(g))(-u''(y_0(\alpha)-g-D)) \\
&-(1-2\bar{p})(-u''(y_0(\alpha)-g))\}
\end{aligned} \tag{A.18}$$

Similarly, the expressions within the brackets on the left-hand side correspond to those in the SOC for α, collectively summing to less than zero. Notably, the right-hand side of this equation mirrors that of the preceding one. As a result, condition (A.16) is sufficient to ensure $\frac{\partial \alpha^*}{\partial g} < 0$. This concludes the proof of Proposition 2.

The remaining aspect of Proposition 2 is to explain how condition (A.16), which establishes substitutability between donation and market-based insurance, requires a sufficiently strong spiritual insurance channel.

Donating g affects the cost-benefit analysis of insurance purchase α in the model through four specific ways. First, through the spiritual insurance channel, donating g reduces the probability of the low-income state, and reduces the expected marginal utility benefit to buying insurance (row 1 of condition (A.16)) that occurs in the claim states. Second, spending g reduces money at hand in all states—akin to the income effect in condition (2)—and increases the benefit of insurance (row 2 and 3 of the condition) that occurs in the claim states. Third, reducing the probability of the low-income state also reduces the expected marginal utility cost of paying the insurance premium (row 4 of the condition) in the non-claim states. Fourth and last, spending g reduces money at hand in all states, and through increases the marginal utility cost of paying the insurance premium (row 5 and 6 of the condition) in the non-claim states.

Condition (A.16) thus first requires a strong enough spiritual insurance channel that dominates the canonical income effect in the claim states, so that the net effects of row 1–3 are positive. This requirement closely resembles condition (2). Then, it requires that the net effect of the spiritual insurance channel is higher in the claim states than in the non-claim states, which is natural given that the optimal insurance coverage is partial in the model and $u'' < 0$. In this case, the net effects in rows 1–3 dominates the net effects in rows 4–6, leading to condition (A.16)

being satisfied, and donations and insurance coverage are substitutes. Alternatively, if the spiritual insurance channel is weak or absent, the relationship between donations and the purchase of insurance is reversed.

A.4 Optimal Donations with Increased Altruism Motive

In this appendix section, we discuss the prediction of an increased altruism motive—characterized by a tendency towards more altruistic acts in adverse or uncertain situations—on donation behavior and on the interplay between donations and insurance purchases.

We proceed with this discussion by including in the plain vanilla initial model without a spiritual insurance motive a warm-glow weight $\theta(D)$ that increases with the size of income uncertainty D. This variable warm-glow weight reflects an increased altruism motive. The agent's objective function is now:

$$\max_{g}(1-2p)u(\bar{I}-g)+pu(\bar{I}-g-D)+pu(\bar{I}-g+D)+\theta(D)v(g) \tag{A.19}$$

We assume that $\theta'(D)>0$ and $\theta''(D)\leq 0$.

It is straight forward to show that $g_I^*(\bar{I},D)>0$ in this model, so that optimal donations increase with expected income $\bar{I}$. The relationship between optimal donations and the size of income uncertainty D is as follows:

$$g_D^*(\bar{I},D)=\frac{pu''(\bar{I}-g+D)-pu''(\bar{I}-g-D)-\theta'(D)v'(g)}{(1-2p)u''(\bar{I}-g)+pu''(\bar{I}-g-D)+pu''(\bar{I}-g+D)+\theta(D)v''(g)} \tag{A.20}$$

With a strong enough increased altruism motive, optimal donations g^* increase with the size of income uncertainty D. The denominator is negative because u is concave. In the numerator, if $\theta'(D)$ is large enough, then the increased altruism motive dominates the income effect, represented by the first two terms in the numerator (which combine to be positive because of positive prudence, $u'''>0$), and results in a negative numerator.

Hence, the empirical finding that higher income uncertainty is observed with more donations is consistent with both the model with a spiritual insurance motive and the model with an increased altruism motive.

However, if we consider the two-dimensional risks situation, things are different. $\frac{\partial g^*}{\partial \alpha}$ and $\frac{\partial \alpha}{\partial g^*}$ in the model with just the increase altruism motive but augmented with two-dimensional risks

are determined as follows:

$$
\begin{aligned}
&g_\alpha^* \{(1-2\bar{p})\left[qu''\left(y_1(\alpha)-g\right)+(1-q)u''\left(y_0(\alpha)-g\right)\right] \\
&+\bar{p}\left[qu''\left(y_1(\alpha)-g+D\right)+(1-q)u''\left(y_0(\alpha)-g+D\right)\right] \\
&+\bar{p}\left[qu''\left(y_1(\alpha)-g-D\right)+(1-q)u''\left(y_0(\alpha)-g-D\right)\right]+\theta(D)v''(g)\} \\
&=q\cdot[1-(1+\lambda)q]\cdot E\cdot\{\bar{p}u''\left(y_1(\alpha)-g+D\right)+\bar{p}u''\left(y_1(\alpha)-g-D\right) \\
&+(1-2\bar{p})u''\left(y_1(\alpha)-g\right)\}-(1-q)\cdot[(1+\lambda)q]\cdot E\cdot\{\bar{p}u''\left(y_0(\alpha)-g+D\right) \\
&+\bar{p}u''\left(y_0(\alpha)-g-D\right)+(1-2\bar{p})u''\left(y_0(\alpha)-g\right)\}
\end{aligned}
\tag{A.21}
$$

$$
\begin{aligned}
&\alpha_g^*\left\{[1-(1+\lambda)q]^2qE\cdot[(1-2\bar{p})u''\left(y_1(\alpha)-g\right)+\bar{p}u''\left(y_1(\alpha)-g+D\right)\right. \\
&\left.+\bar{p}u''\left(y_1(\alpha)-g-D\right)]-[(1+\lambda)q]^2(1-q)E\cdot[(1-2\bar{p})u''\left(y_0(\alpha)-g\right)\right. \\
&\left.+\bar{p}u''\left(y_0(\alpha)-g+D\right)+\bar{p}u''\left(y_0(\alpha)-g-D\right)]\right\} \\
&=q\cdot[1-(1+\lambda)q]\cdot E\cdot\{\bar{p}u''\left(y_1(\alpha)-g+D\right)+\bar{p}u''\left(y_1(\alpha)-g-D\right) \\
&+(1-2\bar{p})u''\left(y_1(\alpha)-g\right)\}-(1-q)\cdot[(1+\lambda)q]\cdot E\cdot\{\bar{p}u''\left(y_0(\alpha)-g+D\right) \\
&+\bar{p}u''\left(y_0(\alpha)-g-D\right)+(1-2\bar{p})u''\left(y_0(\alpha)-g\right)\}
\end{aligned}
\tag{A.22}
$$

The terms within the curly brackets on the left-hand sides of the above equations are negative, aligning with the respective SOCs. The right-hand side, shared by both equations, tends to be negative because $u''' > 0$ and $y_1(\alpha) < y_0(\alpha)$. Consequently, $\frac{\partial g^*}{\partial \alpha}$ and $\frac{\partial \alpha}{\partial g^*}$ tend to be positive. Intuitively, insurance coverage, in this context, does not directly influence $\theta(D)$, thus not diminishing the altruistic donation motive. Instead, it facilitates better consumption smoothing, allowing agents to donate more ex-ante. Conversely, ex-ante donating more reduces the economic resource at hand in expense states and increases the demand for insurance. This dynamic makes insurance purchase and donation complements, rather than substitutes, in the model solely influenced by the increased altruism motive.

A.5 Multiple Hypothesis Testing

Motivated by the observation that donors to religious organizations more frequently state a "seeking blessings" motive (Figure 1), we have compared the degrees to which spiritual insurance predictions manifest in religious versus secular donation behaviors in multiple ways. That is, we have analyzed the difference in the predictive effects of income uncertainty on religious and secular donations, the difference in the predictive effects of health shocks on these donations, as well as difference in their substitutability with insurance.

A statistical risk that arises when we test for differences in religious versus secular donation behaviors in multiple ways is that of false positives dues to multiple hypothesis testing (e.g. Ro-

mano and Wolf, 2005, List, Shaikh, and Xu, 2019; List, Shaikh, and Vayalinkal, 2023). We adjust the p-values for multiple hypothesis testing using the stringent Romano and Wolf (2005) bootstrap procedure that accounts for the dependence structure among the tests, and report the results in Table A.13.

[Table A.13 here]

The adjusted p-values that address multiple hypothesis testing maintain the same statistical significance of the religious versus secular donation comparisons observed in the baseline estimations. Specifically, for the income uncertainty effects, the adjusted (unadjusted) p-values are 0.004 (0.000) for the likelihood to donate and 0.049 (0.026) for the donation amount, both significantly different at the 1% and 5% levels, respectively. For health shock effects, the adjusted (unadjusted) p-values are 0.002 (0.000) for both the likelihood to donate and the donation amount, significantly different at the 1% level. For the pattern of substitutability between donation and insurance purchases, comparing religious donations and secular donations, the coefficient difference tests yield adjusted (unadjusted) p-values of 0.213 (0.186) for the incidence of donation and 0.249 (0.186) for the donation amount, slightly above the threshold for statistically significant difference. Notably and consistently, the coefficient difference point estimates indicate stronger effects for religious donations in response to income uncertainty (0.23% for probability, 0.11 for amount) and health shocks (2.30% for probability, 1.87 for amount), while religious donations appear more substitutable than secular donations (-44.59 for probability, -4.40 for amount). Collectively, these results lead to a rejection of the joint hypothesis that the manifestation of spiritual insurance predictions is equivalent between religious and secular donation behaviors.

References for Online Appendix

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B. Appendix Tables

Table A.1: Income Uncertainty Predicts Donation
(Full set of control coefficients)

Panel A: Probability of donation $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Pr(donation$_{t+1}$)			
Specification	OLS	OLS	OLS	IV	IV	IV
Income uncertainty$_t$	0.70%***	0.70%***	0.70%***	1.86%***	1.92%***	1.90%***
	(0.06%)	(0.06%)	(0.06%)	(0.56%)	(0.59%)	(0.60%)
Income$_t$		-0.02	-0.02		0.07	0.07
		(0.03)	(0.03)		(0.05)	(0.06)
Financial wealth$_t$		0.02	0.02		0.01	0.01
		(0.02)	(0.02)		(0.02)	(0.02)
Age squared		-0.01**	-0.01**		-0.00	-0.00
		(0.00)	(0.00)		(0.00)	(0.00)
Married		0.06	0.04		0.17	0.14
		(0.35)	(0.35)		(0.38)	(0.38)
Education (baseline: Graduate school and above)						
Undergraduate		-0.67	-0.66		-0.57	-0.55
		(0.70)	(0.71)		(0.72)	(0.72)
Vocational school		-0.48	-0.48		-0.32	-0.31
		(0.79)	(0.79)		(0.80)	(0.80)
High school and below		-0.78	-0.78		-0.49	-0.48
		(0.77)	(0.77)		(0.75)	(0.75)
Occupation (baseline: Public sector officers)						
Agricultural workers		0.24	0.56		0.67	1.04
		(1.18)	(1.21)		(1.43)	(1.47)
Blue-collar workers		0.12	0.15		-0.16	-0.14
		(1.04)	(1.04)		(1.25)	(1.25)
White-collar workers		-0.06	-0.04		-0.35	-0.33
		(1.06)	(1.06)		(1.26)	(1.26)
Service-sector workers		-0.11	-0.10		-0.45	-0.44
		(1.18)	(1.18)		(1.37)	(1.37)
Owner-managers		0.60	0.62		0.37	0.38
		(1.37)	(1.37)		(1.58)	(1.58)
Executives		1.05	1.07		0.89	0.90
		(1.16)	(1.16)		(1.36)	(1.36)
Others		0.50	0.52		0.22	0.26
		(1.06)	(1.06)		(1.27)	(1.27)
Dependents (baseline: No dependent)						
One dependent		-1.10	-1.09		-1.33	-1.32
		(0.86)	(0.86)		(0.95)	(0.95)
Two dependents		-0.94	-0.91		-1.77*	-1.73
		(1.02)	(1.02)		(1.07)	(1.07)
More than two dependents		-1.82	-1.81		-0.72	-0.74
		(1.25)	(1.25)		(0.70)	(0.70)
Constant	1.74***	10.05**	10.28**			
	(0.00)	(4.02)	(4.02)			
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	403.0	394.0	378.8
R^2-Adjusted	0.384	0.384	0.384	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City $\times$ quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel B: Donation amount $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Donation amount$_{t+1}$			
Specification	OLS	OLS	OLS	IV	IV	IV
Income uncertainty$_t$	0.53***	0.52***	0.53***	2.09***	2.17***	2.13**
	(0.06)	(0.06)	(0.06)	(0.77)	(0.81)	(0.83)
Income$_t$		0.01	0.02		0.12	0.12
		(0.06)	(0.06)		(0.07)	(0.07)
Financial wealth$_t$		0.04*	0.04*		0.02	0.02
		(0.02)	(0.02)		(0.02)	(0.02)
Age squared		-0.01**	-0.01**		-0.01*	-0.01*
		(0.00)	(0.00)		(0.00)	(0.00)
Married		0.17	0.16		0.28	0.26
		(0.29)	(0.29)		(0.30)	(0.30)
Education (baseline: Graduate school and above)						
Undergraduate		-0.71	-0.71		-0.50	-0.49
		(0.56)	(0.56)		(0.57)	(0.57)

Vocational school		-0.30	-0.29		0.04	0.04
		(0.65)	(0.65)		(0.65)	(0.65)
High school and below		-0.84	-0.83		-0.40	-0.40
		(0.62)	(0.63)		(0.60)	(0.60)
Occupation (baseline: Public sector officers)						
Agricultural workers		0.34	0.62		0.73	1.09
		(0.89)	(0.91)		(1.11)	(1.15)
Blue-collar workers		0.12	0.14		-0.16	-0.15
		(0.74)	(0.74)		(0.91)	(0.91)
White-collar workers		-0.08	-0.06		-0.37	-0.36
		(0.75)	(0.75)		(0.92)	(0.92)
Service-sector workers		0.40	0.40		0.09	0.09
		(0.89)	(0.89)		(1.04)	(1.04)
Owner-managers		0.35	0.35		0.03	0.02
		(1.07)	(1.07)		(1.23)	(1.23)
Executives		0.04	0.04		-0.46	-0.45
		(1.05)	(1.05)		(1.19)	(1.19)
Others		0.79	0.80		0.44	0.48
		(0.85)	(0.85)		(1.04)	(1.04)
Dependents (baseline: No dependent)						
One dependent		-0.52	-0.51		-0.69	-0.68
		(1.05)	(1.05)		(1.16)	(1.16)
Two dependents		-0.67	-0.66		-1.32	-1.29
		(0.79)	(0.79)		(0.85)	(0.85)
More than two dependents		-1.49	-1.50		-0.33	-0.37
		(1.13)	(1.13)		(0.42)	(0.41)
Constant	1.56***	12.31***	12.62***			
	(0.00)	(4.67)	(4.70)			
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	403.0	394.0	378.8
R^2-Adjusted	0.402	0.402	0.402	/	/	/
Uncond. Mean(Dona. Amt$_{t+1}$)	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES

Panel C: First stage regression of instrumental variable approach

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable				Income uncertainty		
Firm-level average of income				3.23***	3.08***	3.01***
uncertainty (leave-one-out)				(0.16)	(0.16)	(0.15)
Income					-0.07***	-0.07***
					(0.00)	(0.00)
Financial wealth					0.01***	0.01***
					(0.00)	(0.00)
Age × Age					-0.00***	-0.00***
					(0.00)	(0.00)
Married					0.03*	0.04*
					(0.02)	(0.02)
Education (baseline: Graduate school and above)						
Undergraduate					-0.07*	-0.08**
					(0.04)	(0.04)
Vocational school					-0.15***	-0.15***
					(0.04)	(0.04)
High school and below					-0.14***	-0.14***
					(0.04)	(0.04)
Occupation (baseline: Public sector officers)						
Agricultural workers					-0.06	-0.11
					(0.32)	(0.32)
Blue-collar workers					0.17**	0.18***
					(0.07)	(0.07)
White-collar workers					0.19***	0.20***
					(0.07)	(0.07)
Service-sector workers					0.12*	0.13*
					(0.07)	(0.07)
Owner-managers					0.16*	0.18**
					(0.09)	(0.09)
Executives					0.23***	0.24***
					(0.07)	(0.07)
Others					0.28***	0.27***
					(0.07)	(0.07)
Dependents (baseline: No dependent)						
One dependent					0.06	0.06
					(0.05)	(0.05)
Two dependents					0.16***	0.15***
					(0.06)	(0.06)
More than two dependents					-0.03	-0.03

		(0.17)	(0.17)
Observations	273,616	273,616	273,616
F test statistics	403.0	394.0	378.8
Control variables	NO	YES	YES
Individual fixed effect	YES	YES	YES
Quarter fixed effect	YES	YES	YES
City × quarter fixed effect	NO	NO	YES

Notes: This table reports the full set of coefficients of regressions predicting donation behavior using individual-level income uncertainty. The dependent variable is the next-quarter likelihood to donate in Panel A and the next-quarter donation amount in Panel B. The main independent variable of interest, income uncertainty, is the standard deviation of the unpredicted component of all realized log monthly payroll income in the last four quarters. Control variables include the current quarter's income (in logarithms), financial wealth (in logarithms), and demographic variables that include age (omitted due to multi-collinearity), age squared, educational attainment, occupational type, marital status, and the number of dependents. All currency units are converted to USD at the exchange rate. Columns (1)-(3) of Panels A and B report OLS estimates, while columns (4)-(6) report instrumental variable estimates, where individual-level income uncertainty is instrumented by the firm-level leave-one-out average of income uncertainty. Panel C validates the instrumental variable approach by presenting the first-stage regression results, showing the relationship between the instrument (firm-level leave-one-out average of income uncertainty) and the endogenous variable (individual-level income uncertainty), alongside other control variables. Standard errors are clustered at the individual level and are reported beneath the estimated coefficient within parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standardized coefficients are reported for continuous dependent variables.

Table A.2: Predicting Donations using Income Uncertainty
(Alternative model specifications)

Panel A: Income uncertainty computed using realized monthly payroll income in three recent quarters (instead of four)						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable		Pr(donation$_{t+1}$)			Donation amount$_{t+1}$	
Income uncertainty$_t$	0.42%***	0.43%***	0.44%***	0.38***	0.38***	0.39***
	(0.04%)	(0.04%)	(0.04%)	(0.05)	(0.05)	(0.05)
Income$_t$		0.00	0.00		0.02	0.03
		(0.02)	(0.02)		(0.02)	(0.02)
Observations	370,115	370,115	370,115	370,115	370,115	370,115
R^2-Adjusted	0.245	0.245	0.246	0.212	0.212	0.212
Dep. var. mean	1.46%	1.46%	1.46%	1.42	1.42	1.42
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel B: Income uncertainty computed using realized monthly payroll income in two recent quarters (instead of four)						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable		Pr(donation t+1)			Donation amount t+1	
Income uncertainty$_t$	0.26%***	0.24%***	0.24%***	0.22***	0.21***	0.21***
	(0.03%)	(0.03%)	(0.03%)	(0.04)	(0.04)	(0.04)
Income$_t$		0.01	0.02		0.03	0.03
		(0.02)	(0.02)		(0.02)	(0.02)
Observations	444,138	444,138	444,138	444,138	444,138	444,138
R^2-Adjusted	0.217	0.217	0.218	0.212	0.212	0.212
Dep. var. mean	1.46%	1.46%	1.46%	1.42	1.42	1.42
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel C: Predicting donations in the next month (instead of donations in the next quarter)						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable		Pr(donation t+1)			Donation amount t+1	
Income uncertainty$_t$	0.26%***	0.26%***	0.27%***	0.18***	0.19***	0.20***
	(0.02%)	(0.02%)	(0.02%)	(0.02)	(0.02)	(0.02)
Income$_t$		0.01	-0.00		0.02	0.02
		(0.02)	(0.02)		(0.02)	(0.02)
Observations	888,276	888,276	888,276	888,276	888,276	888,276
R^2-Adjusted	0.602	0.602	0.602	0.181	0.181	0.181
Dep. var. mean	1.01%	1.01%	1.01%	0.52	0.52	0.52
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES

Notes: This table reports estimates of regressions predicting donation behavior using alternative model specifications. Panels A and B report the specifications where income uncertainty is computed using realized monthly payroll income in a shorter 3-quarter or 2-quarter recent period (instead of the baseline four quarters) as the independent variable, respectively. Panel C reports the specification where we alternatively predict donations in the next month (instead of the baseline donations in the next quarter) using the income uncertainty independent variable as computed in the baseline. The dependent variables in columns (1)-(3) and columns (4)-(6) are the likelihood to donate, and the donation amount, respectively. Control variables include the income for the same period as donation (in logarithms), financial wealth (in logarithms), and demographic variables that include age, age squared, educational attainment, occupational type, marital status, and the number of dependents. All currency units are converted to USD at the exchange rate. Standard errors are clustered at the individual level and are reported beneath the estimated coefficient within parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standardized coefficients are reported for continuous dependent variables.

Table A.3: Income Uncertainty Predicts Donation: Religious Charities and Negative Uncertainty (Full set of control coefficients)

Panel A: Probability of donation $(t+1)$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Pr(donation$_{t+1}$)							
Charity type	Religious	Secular	Religious	Secular	Religious	Secular	Religious	Secular
Specification	OLS	OLS	OLS	OLS	IV	IV	IV	IV
Income uncertainty$_t$	0.47%***	0.24%***			1.23%***	0.64%		
	(0.04%)	(0.04%)			(0.45%)	(0.40%)		
Positive uncertainty$_t$			0.19%***	0.09%***			0.36%	0.17%
			(0.03%)	(0.02%)			(0.23%)	(0.20%)
Negative uncertainty$_t$			0.27%***	0.15%***			1.06%*	0.39%
			(0.05%)	(0.04%)			(0.55%)	(0.47%)
Income$_t$	0.05*	-0.06***	0.04*	-0.06***	0.10**	-0.03	0.10**	-0.04
	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)
Financial wealth$_t$	0.00	0.02	0.00	0.02	0.00	0.01	0.01	0.01
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Age squared	-0.00	-0.00***	-0.00	-0.00***	0.00	-0.00**	0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.27	-0.20	0.27	-0.20	0.25	-0.07	0.24	-0.08
	(0.25)	(0.25)	(0.25)	(0.25)	(0.28)	(0.26)	(0.28)	(0.26)
Education (baseline: Graduate school and above)								
Undergraduate	-0.28	-0.42	-0.28	-0.42	-0.42	-0.19	-0.41	-0.20
	(0.53)	(0.47)	(0.53)	(0.47)	(0.56)	(0.46)	(0.56)	(0.46)
Vocational school	0.39	-0.74	0.39	-0.74	0.28	-0.46	0.30	-0.47
	(0.58)	(0.56)	(0.58)	(0.56)	(0.61)	(0.55)	(0.61)	(0.55)
High school and below	-0.17	-0.57	-0.17	-0.57	-0.24	-0.21	-0.22	-0.23
	(0.53)	(0.57)	(0.53)	(0.57)	(0.54)	(0.53)	(0.55)	(0.53)
Occupation (baseline: Public sector officers)								
Agricultural workers	0.73	-0.15	0.71	-0.15	1.01	0.07	1.03	0.05
	(1.01)	(0.59)	(1.01)	(0.59)	(1.22)	(0.70)	(1.21)	(0.68)
Blue-collar workers	0.53	-0.35	0.53	-0.35	0.43	-0.52	0.46	-0.49
	(0.90)	(0.51)	(0.90)	(0.51)	(1.07)	(0.61)	(1.08)	(0.61)
White-collar workers	0.44	-0.50	0.44	-0.50	0.35	-0.68	0.37	-0.66
	(0.91)	(0.51)	(0.92)	(0.51)	(1.09)	(0.61)	(1.09)	(0.61)
Service-sector workers	0.95	-1.06*	0.94	-1.06*	0.84	-1.28**	0.85	-1.26*
	(1.03)	(0.56)	(1.03)	(0.56)	(1.20)	(0.65)	(1.20)	(0.65)
Owner-managers	0.97	-0.43	0.96	-0.44	0.95	-0.63	0.89	-0.63
	(0.95)	(0.99)	(0.95)	(0.99)	(1.12)	(1.10)	(1.12)	(1.10)
Executives	1.45	-0.53	1.44	-0.53	1.48	-0.73	1.47	-0.70
	(0.98)	(0.63)	(0.98)	(0.63)	(1.14)	(0.73)	(1.14)	(0.73)
Others	1.07	-0.49	1.06	-0.49	1.03	-0.68	1.02	-0.66
	(0.93)	(0.51)	(0.93)	(0.51)	(1.10)	(0.61)	(1.10)	(0.61)
Dependents (baseline: No dependent)								
One dependent	-1.38*	0.28	-1.38*	0.28	-1.56**	0.24	-1.53*	0.26
	(0.71)	(0.50)	(0.71)	(0.49)	(0.78)	(0.54)	(0.78)	(0.54)
Two dependents	-0.54	-0.38	-0.54	-0.38	-0.74	-0.99*	-0.75	-0.97*
	(0.84)	(0.58)	(0.84)	(0.58)	(0.93)	(0.54)	(0.92)	(0.54)
More than two dependents	-0.64	-1.18	-0.64	-1.18	-0.67	-0.08	-0.66	-0.07
	(0.59)	(1.11)	(0.59)	(1.11)	(0.66)	(0.16)	(0.66)	(0.15)
Constant	0.63	9.12***	0.67	9.11***				
	(3.10)	(2.54)	(3.10)	(2.54)				
Observations	296,092	296,092	296,092	296,092	273,616	273,616	273,616	273,616
First-stage F-stat.	/	/	/	/	378.8	378.8	159.7	159.7
R^2-Adjusted	0.382	0.383	0.382	0.383	/	/	/	/
Mean Pr(Donation$_{t+1}$)	0.89%	0.61%	0.89%	0.61%	0.89%	0.61%	0.89%	0.61%
Cond. Mean(Dona. Amt$_{t+1}$)	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES	YES	YES

Panel B: Donation amount $(t+1)$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Donation amount$_{t+1}$							
Charity type	Religious	Secular	Religious	Secular	Religious	Secular	Religious	Secular
Specification	OLS	OLS	OLS	OLS	IV	IV	IV	IV
Income uncertainty$_t$	0.32***	0.21***			1.40**	0.73*		
	(0.04)	(0.04)			(0.71)	(0.43)		
Positive uncertainty$_t$			0.13***	0.07***			0.36	0.23
			(0.02)	(0.03)			(0.33)	(0.21)
Negative uncertainty$_t$			0.19***	0.14***			1.27*	0.35
			(0.05)	(0.04)			(0.77)	(0.50)
Income$_t$	0.03	-0.05	0.03	-0.05	0.12**	-0.00	0.12*	-0.01
	(0.05)	(0.04)	(0.05)	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)
Financial wealth$_t$	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)

Age squared	-0.00	-0.01***	-0.00	-0.01***	-0.00	-0.00**	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.26	-0.10	0.26	-0.11	0.25	0.01	0.23	0.01
	(0.20)	(0.21)	(0.20)	(0.21)	(0.22)	(0.21)	(0.22)	(0.21)
Education (baseline: Graduate school and above)								
Undergraduate	-0.14	-0.57	-0.14	-0.57	-0.14	-0.34	-0.13	-0.35
	(0.38)	(0.41)	(0.38)	(0.41)	(0.42)	(0.39)	(0.43)	(0.39)
Vocational school	0.37	-0.66	0.37	-0.66	0.42	-0.36	0.45	-0.38
	(0.42)	(0.48)	(0.42)	(0.48)	(0.46)	(0.45)	(0.47)	(0.45)
High school and below	-0.14	-0.69	-0.14	-0.69	-0.05	-0.34	-0.03	-0.36
	(0.36)	(0.51)	(0.36)	(0.51)	(0.40)	(0.45)	(0.41)	(0.45)
Occupation (baseline: Public sector officers)								
Agricultural workers	0.83	-0.20	0.81	-0.21	1.07	0.03	1.11	-0.01
	(0.62)	(0.59)	(0.62)	(0.59)	(0.83)	(0.68)	(0.79)	(0.66)
Blue-collar workers	0.60	-0.45	0.59	-0.45	0.48	-0.65	0.53	-0.63
	(0.53)	(0.51)	(0.53)	(0.51)	(0.65)	(0.61)	(0.65)	(0.61)
White-collar workers	0.47	-0.53	0.46	-0.53	0.36	-0.74	0.39	-0.71
	(0.53)	(0.51)	(0.53)	(0.52)	(0.65)	(0.62)	(0.66)	(0.62)
Service-sector workers	1.13	-0.73	1.12	-0.73	1.02	-0.95	1.06	-0.94
	(0.72)	(0.51)	(0.72)	(0.51)	(0.83)	(0.60)	(0.83)	(0.60)
Owner-managers	0.94	-0.59	0.94	-0.59	0.80	-0.81	0.73	-0.79
	(0.61)	(0.86)	(0.61)	(0.86)	(0.72)	(0.97)	(0.74)	(0.97)
Executives	1.09*	-1.05	1.09*	-1.05	0.84	-1.32	0.83	-1.29
	(0.63)	(0.75)	(0.63)	(0.75)	(0.72)	(0.84)	(0.72)	(0.84)
Others	1.06*	-0.25	1.05*	-0.25	0.91	-0.46	0.91	-0.43
	(0.57)	(0.57)	(0.57)	(0.57)	(0.70)	(0.69)	(0.71)	(0.69)
Dependents (baseline: No dependent)								
One dependent	-1.06	0.55	-1.06	0.55	-1.23	0.55	-1.18	0.56
	(0.95)	(0.45)	(0.95)	(0.45)	(1.05)	(0.50)	(1.05)	(0.50)
Two dependents	-0.62	-0.03	-0.62	-0.03	-0.87	-0.44*	-0.88	-0.41*
	(0.73)	(0.30)	(0.73)	(0.30)	(0.81)	(0.24)	(0.81)	(0.24)
More than two dependents	-0.32	-1.18	-0.31	-1.18	-0.31	-0.06	-0.29	-0.06
	(0.24)	(1.10)	(0.24)	(1.10)	(0.32)	(0.16)	(0.31)	(0.13)
Constant	3.20	9.54***	3.22	9.53***				
	(3.86)	(2.51)	(3.86)	(2.50)				
Observations	296,092	296,092	296,092	296,092	273,616	273,616	273,616	273,616
First-stage F-stat.	/	/	/	/	378.8	378.8	159.7	159.7
R^2-Adjusted	0.368	0.444	0.368	0.444	/	/	/	/
Uncond. Mean(Dona. Amt$_{t+1}$)	\$0.84	\$0.58	\$0.84	\$0.58	\$0.84	\$0.58	\$0.84	\$0.58
Cond. Mean(Dona. Amt$_{t+1}$)	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4	\$94.4
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES	YES	YES
City $\times$ quarter FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: This table reports the full set of coefficients of regressions where within-person variations in income uncertainty predict the likelihood and amount of donations to religious charities and donations to secular charities. The dependent variable is the next-quarter likelihood to donate in Panel A and the next-quarter donation amount in Panel B for the respective charity type. The main independent variables of interest include income uncertainty, as the standard deviation of the unpredicted component of all realized log monthly payroll income in the last four quarters, and positive income uncertainty and negative income uncertainty, as constructed using the semi-variance approach. Columns (1)-(4) report OLS estimates. Columns (5)-(8) report instrumental variable estimates, where individual-level (positive, negative) income uncertainty is instrumented by the firm-level leave-oneout average of (positive, negative) income uncertainty. Control variables are log income, log financial wealth, and demographic variables that include age, age squared, education, occupation, marital status, and number of dependents. Standardized coefficients are reported for continuous dependent variables. All currency units are converted to USD. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table A.4: Health Shocks Predicts Donation: Religious Charities and Secular Charities (Full Set of Control Coefficients)

Panel A: Probability of donation $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Pr(donation$_{t+1}$)			
Charity type	All	Religious	Secular	All	Religious	Secular
Health shock occurrence$_t$	3.94%***	3.15%***	0.85%***			
	(0.25%)	(0.21%)	(0.14%)			
Health shock amount$_t$				0.76%***	0.61%***	0.16%***
				(0.21%)	(0.17%)	(0.05%)
Income$_t$	-0.01	0.06	-0.08**	-0.02	0.05	-0.08**
	(0.06)	(0.05)	(0.04)	(0.06)	(0.05)	(0.04)
Financial wealth$_t$	0.03	0.01	0.02	0.02	0.01	0.02
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)
Age squared	-0.01**	-0.00	-0.01***	-0.01**	-0.00	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.03	0.26	-0.20	0.06	0.28	-0.19
	(0.35)	(0.25)	(0.25)	(0.35)	(0.25)	(0.25)
Education (baseline: Graduate school and above)						
Undergraduate	-0.71	-0.32	-0.44	-0.70	-0.30	-0.44
	(0.69)	(0.52)	(0.47)	(0.70)	(0.53)	(0.47)
Vocational school	-0.52	0.38	-0.76	-0.55	0.35	-0.77
	(0.78)	(0.57)	(0.56)	(0.79)	(0.57)	(0.56)
High school and below	-0.78	-0.16	-0.58	-0.82	-0.20	-0.59
	(0.76)	(0.52)	(0.57)	(0.77)	(0.53)	(0.57)
Occupation (baseline: Public sector officers)						
Agricultural workers	-0.66	-0.22	-0.42	0.37	0.61	-0.20
	(1.29)	(1.11)	(0.58)	(1.20)	(1.01)	(0.58)
Blue-collar workers	0.27	0.62	-0.31	0.28	0.63	-0.30
	(1.04)	(0.90)	(0.51)	(1.04)	(0.90)	(0.51)
White-collar workers	0.20	0.62	-0.43	0.13	0.56	-0.44
	(1.05)	(0.91)	(0.51)	(1.05)	(0.91)	(0.51)
Service-sector workers	0.15	1.14	-0.99*	-0.03	1.00	-1.03*
	(1.17)	(1.03)	(0.56)	(1.18)	(1.03)	(0.56)
Owner-managers	0.73	1.06	-0.39	0.71	1.04	-0.40
	(1.37)	(0.95)	(0.98)	(1.37)	(0.95)	(0.98)
Executives	1.25	1.57	-0.47	1.22	1.55	-0.48
	(1.16)	(0.97)	(0.63)	(1.16)	(0.97)	(0.63)
Others	0.81	1.28	-0.40	0.72	1.21	-0.42
	(1.06)	(0.93)	(0.51)	(1.06)	(0.93)	(0.51)
Dependents (baseline: No dependent)						
One dependent	-0.95	-1.27*	0.32	-1.05	-1.35*	0.30
	(0.86)	(0.70)	(0.50)	(0.87)	(0.71)	(0.50)
Two dependents	-0.85	-0.51	-0.35	-0.84	-0.49	-0.35
	(1.01)	(0.84)	(0.57)	(1.02)	(0.84)	(0.58)
More than two dependents	-1.78	-0.62	-1.18	-1.79	-0.63	-1.18
	(1.24)	(0.57)	(1.11)	(1.25)	(0.59)	(1.11)
Constant	10.31***	0.95	9.42***	10.93***	1.44	9.55***
	(3.94)	(3.09)	(2.54)	(3.95)	(3.10)	(2.54)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.387	0.386	0.383	0.385	0.384	0.383
Mean Pr(Donation$_{t+1}$)	1.46%	0.89%	0.61%	1.46%	0.89%	0.61%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$94.39	\$94.40	\$97.10	\$94.39	\$94.40
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES
Panel B: Donation amount $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Donation amount$_{t+1}$			
Charity type	All	Religious	Secular	All	Religious	Secular
Health shock occurrence$_t$	2.08***	1.98***	0.11			
	(0.23)	(0.20)	(0.12)			
Health shock amount$_t$				0.44***	0.42***	0.02
				(0.13)	(0.12)	(0.02)
Income$_t$	-0.05	0.01	-0.06	-0.05	0.01	-0.06
	(0.06)	(0.05)	(0.04)	(0.06)	(0.05)	(0.04)
Financial wealth$_t$	0.04**	0.03	0.02	0.04**	0.03	0.02
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)
Age squared	-0.01**	-0.00	-0.01***	-0.01**	-0.00	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Married	0.16	0.25	-0.10	0.17	0.27	-0.10
	(0.29)	(0.20)	(0.21)	(0.29)	(0.20)	(0.21)
Education (baseline: Graduate school and above)						
Undergraduate	-0.74	-0.16	-0.58	-0.73	-0.15	-0.58
	(0.56)	(0.38)	(0.41)	(0.56)	(0.38)	(0.41)

Vocational school	-0.33	0.36	-0.69	-0.35	0.34	-0.69
	(0.64)	(0.41)	(0.48)	(0.65)	(0.42)	(0.48)
High school and below	-0.85	-0.14	-0.71	-0.87	-0.16	-0.71
	(0.62)	(0.35)	(0.51)	(0.62)	(0.36)	(0.51)
Occupation (baseline: Public sector officers)						
Agricultural workers	-0.04	0.23	-0.27	0.51	0.74	-0.24
	(0.91)	(0.66)	(0.59)	(0.91)	(0.62)	(0.59)
Blue-collar workers	0.24	0.66	-0.42	0.24	0.66	-0.42
	(0.74)	(0.53)	(0.51)	(0.74)	(0.53)	(0.51)
White-collar workers	0.09	0.58	-0.49	0.06	0.55	-0.49
	(0.75)	(0.53)	(0.51)	(0.75)	(0.53)	(0.51)
Service-sector workers	0.55	1.25*	-0.70	0.45	1.16	-0.71
	(0.89)	(0.72)	(0.51)	(0.89)	(0.72)	(0.51)
Owner-managers	0.45	1.00	-0.55	0.43	0.99	-0.56
	(1.07)	(0.61)	(0.86)	(1.07)	(0.61)	(0.86)
Executives	0.17	1.17*	-1.00	0.16	1.16*	-1.00
	(1.05)	(0.63)	(0.75)	(1.05)	(0.63)	(0.75)
Others	1.00	1.20**	-0.19	0.95	1.15**	-0.20
	(0.85)	(0.57)	(0.57)	(0.85)	(0.57)	(0.57)
Dependents (baseline: No dependent)						
One dependent	-0.42	-0.99	0.57	-0.48	-1.04	0.56
	(1.05)	(0.95)	(0.45)	(1.05)	(0.95)	(0.45)
Two dependents	-0.60	-0.59	-0.01	-0.59	-0.59	-0.01
	(0.79)	(0.73)	(0.30)	(0.79)	(0.73)	(0.30)
More than two dependents	-1.49	-0.30	-1.18	-1.49	-0.31	-1.18
	(1.12)	(0.23)	(1.10)	(1.13)	(0.24)	(1.10)
Constant	13.32***	3.44	9.87***	13.64***	3.75	9.89***
	(4.66)	(3.87)	(2.51)	(4.66)	(3.86)	(2.51)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.402	0.369	0.443	0.402	0.369	0.443
Uncond. Mean(Dona. Amt$_{t+1}$)	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42	\$1.42
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City $\times$ quarter FE	YES	YES	YES	YES	YES	YES

Notes: This table reports the full set of coefficients of regressions where within-person variations in health shocks predict the likelihood and amount of donations to all charities, to religious charities, and to secular charities. The dependent variable is the quarter $t+1$ likelihood to donate in Panel A and the donation amount in Panel B for the respective charity type. The main dependent variable of interest, health shock, is defined as the dummy of incurring medical expenditures in the past quarter that are above the median of the sample in Columns (1)-(3), and as the amount spent on medical expenditures in the past quarter that are above the median of the sample in Columns (4)-(6). Control variables and fixed effects are the same as in Table A.1. All currency units are converted to USD at the exchange rate. Standard errors are clustered at the individual level and are reported beneath the estimated coefficient within parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Standardized coefficients are reported for continuous dependent variables.

Table A.5: Donation Associated with Reduction in Contemporaneous Insurance Expenditures (Full set of control coefficients)

Panel A: Whether donated in the same quarter $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Insurance expenditures$_{t+1}$ ($)					
Charity type	All	Religious	Secular	All	Religious	Secular
Donation dummy$_{t+1}$	-80.40***	-98.67***	-54.08	7.06	14.82	0.14
	(25.76)	(32.58)	(37.90)	(37.03)	(48.70)	(52.96)
Income uncertainty$_t$ ×				-97.68**	-125.25**	-60.19
Donation dummy$_{t+1}$				(42.77)	(58.79)	(52.98)
Income uncertainty$_t$	86.58***	86.47***	86.14***	88.09***	87.66***	86.52***
	(19.64)	(19.63)	(19.62)	(19.83)	(19.75)	(19.69)
Income$_t$	64.91***	64.97***	64.86***	64.68***	64.78***	64.80***
	(24.50)	(24.50)	(24.50)	(24.52)	(24.51)	(24.51)
Financial wealth$_t$	-1.66	-1.67	-1.66	-1.70	-1.71	-1.67
	(7.35)	(7.35)	(7.36)	(7.35)	(7.35)	(7.35)
Age squared	1.24	1.24	1.24	1.24	1.24	1.24
	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)
Married	-115.16	-114.92	-115.30	-115.34	-115.42	-115.18
	(119.99)	(119.99)	(120.01)	(120.00)	(120.00)	(120.00)
Education (baseline: Graduate school and above)						
Undergraduate	24.95	25.20	25.25	24.77	24.92	25.29
	(1,740.89)	(1,740.87)	(1,740.89)	(1,740.91)	(1,740.90)	(1,740.89)
Vocational school	-330.90	-330.12	-330.91	-331.07	-330.20	-331.05
	(1,717.99)	(1,717.95)	(1,718.02)	(1,718.00)	(1,717.96)	(1,718.05)
High school and below	-755.36	-754.90	-755.04	-755.76	-755.37	-755.08
	(1,889.16)	(1,889.13)	(1,889.17)	(1,889.19)	(1,889.15)	(1,889.17)
Occupation (baseline: Public sector officers)						
Agricultural workers	229.06	229.34	228.55	230.21	230.54	228.74
	(344.95)	(344.96)	(344.94)	(344.75)	(344.75)	(344.94)
Blue-collar workers	-204.26	-203.85	-204.57	-203.81	-203.29	-204.55
	(252.91)	(252.91)	(252.97)	(252.88)	(252.86)	(252.98)
White-collar workers	-133.49	-133.02	-133.72	-132.81	-132.35	-133.68
	(247.96)	(247.95)	(248.03)	(247.92)	(247.90)	(248.03)
Service-sector workers	-947.82	-946.79	-948.30	-946.58	-945.20	-948.32
	(902.60)	(902.58)	(902.68)	(902.57)	(902.57)	(902.68)
Owner-managers	-189.80	-189.33	-190.53	-188.94	-187.80	-190.86
	(314.85)	(314.86)	(314.92)	(314.80)	(314.80)	(314.93)
Executives	-65.13	-64.55	-66.27	-64.15	-63.38	-66.49
	(276.77)	(276.78)	(276.86)	(276.72)	(276.71)	(276.89)
Others	534.64	535.28	533.97	534.90	535.78	534.04
	(585.98)	(585.98)	(585.96)	(585.97)	(585.96)	(585.97)
Dependents (baseline: No dependent)						
One dependent	-350.33	-350.81	-349.30	-349.40	-348.74	-349.72
	(341.83)	(341.84)	(341.83)	(341.85)	(341.87)	(341.84)
Two dependents	79.88	80.08	80.41	82.56	83.18	80.57
	(86.29)	(86.31)	(86.28)	(86.27)	(86.28)	(86.29)
More than two dependents	345.81	346.64	346.63	346.79	347.52	346.79
	(366.38)	(366.36)	(366.38)	(366.35)	(366.34)	(366.37)
Constant	-1,533.96	-1,541.14	-1,536.82	-1,534.38	-1,538.81	-1,537.91
	(1,590.03)	(1,589.71)	(1,590.15)	(1,590.01)	(1,589.79)	(1,590.07)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Mean(Insur. exp. t+1)	$242.01	$242.01	$242.01	$242.01	$242.01	$242.01
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES
Panel B: Donation amount in the same quarter $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Insurance expenditures$_{t+1}$ ($)					
Charity type	All	Religious	Secular	All	Religious	Secular
Donation amount$_{t+1}$	-6.26*	-6.38**	-1.98	0.97	0.14	1.50
	(3.31)	(3.12)	(3.82)	(4.14)	(3.91)	(4.69)
Income uncertainty$_t$ ×				-7.74**	-7.19**	-3.58
Donation dummy$_{t+1}$				(3.68)	(3.54)	(3.93)
Income uncertainty$_t$	86.23***	86.19***	86.05***	86.17***	86.14***	86.03***
	(19.62)	(19.61)	(19.62)	(19.62)	(19.61)	(19.62)
Income$_t$	64.88***	64.91***	64.88***	64.81***	64.88***	64.84***
	(24.50)	(24.50)	(24.50)	(24.51)	(24.50)	(24.51)
Financial wealth$_t$	-1.66	-1.66	-1.67	-1.67	-1.68	-1.67
	(7.36)	(7.35)	(7.36)	(7.35)	(7.35)	(7.35)
Age squared	1.24	1.24	1.24	1.24	1.24	1.24
	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)
Married	-115.12	-115.04	-115.21	-115.07	-115.18	-115.08
	(119.99)	(119.99)	(120.00)	(119.99)	(119.99)	(119.98)
Education (baseline: Graduate school and above)						

Undergraduate	25.18	25.40	25.36	25.12	25.34	25.35
	(1,740.89)	(1,740.86)	(1,740.90)	(1,740.89)	(1,740.87)	(1,740.91)
Vocational school	-330.63	-330.30	-330.65	-330.58	-330.13	-330.70
	(1,717.97)	(1,717.96)	(1,718.01)	(1,717.97)	(1,717.96)	(1,718.03)
High school and below	-755.09	-754.81	-754.88	-755.18	-754.79	-754.95
	(1,889.15)	(1,889.12)	(1,889.17)	(1,889.16)	(1,889.13)	(1,889.19)
Occupation (baseline: Public sector officers)						
Agricultural workers	228.89	229.10	228.58	229.32	229.32	228.78
	(344.97)	(344.95)	(344.95)	(344.94)	(344.89)	(344.98)
Blue-collar workers	-204.31	-204.03	-204.47	-204.44	-204.11	-204.51
	(252.95)	(252.96)	(252.98)	(252.95)	(252.94)	(252.99)
White-collar workers	-133.48	-133.19	-133.57	-133.46	-133.16	-133.56
	(248.01)	(248.01)	(248.03)	(248.00)	(247.99)	(248.04)
Service-sector workers	-947.56	-947.08	-947.89	-947.20	-946.65	-947.87
	(902.60)	(902.60)	(902.66)	(902.58)	(902.61)	(902.66)
Owner-managers	-190.14	-189.75	-190.42	-189.99	-188.92	-190.80
	(314.90)	(314.90)	(314.93)	(314.89)	(314.89)	(314.96)
Executives	-65.96	-65.36	-66.21	-66.38	-65.04	-66.69
	(276.83)	(276.83)	(276.89)	(276.84)	(276.81)	(276.94)
Others	534.57	534.84	534.17	534.93	534.84	534.45
	(586.00)	(585.99)	(585.97)	(586.01)	(585.98)	(586.02)
Dependents (baseline: No dependent)						
One dependent	-349.67	-350.06	-349.33	-348.56	-348.27	-349.61
	(341.83)	(341.83)	(341.83)	(341.84)	(341.89)	(341.84)
Two dependents	80.33	80.26	80.61	81.61	81.79	80.62
	(86.30)	(86.30)	(86.29)	(86.28)	(86.30)	(86.29)
More than two dependents	346.63	347.09	347.01	346.96	347.37	347.10
	(366.37)	(366.36)	(366.37)	(366.36)	(366.35)	(366.37)
Constant	-1,536.32	-1,539.92	-1,539.67	-1,538.27	-1,541.08	-1,540.53
	(1,590.00)	(1,589.74)	(1,590.13)	(1,589.90)	(1,589.71)	(1,590.04)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Mean(Insur. exp.$_{t+1}$)	\$242.01	\$242.01	\$242.01	\$242.01	\$242.01	\$242.01
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City $\times$ quarter FE	YES	YES	YES	YES	YES	YES

Notes: This table reports the full set of coefficients of regressions examining the contemporaneous association between donations and insurance expenditures using within-person variations in insurance spending, donations, and income uncertainty. The dependent variable is the insurance expenditures in quarter $t+1$. In columns (1)-(3) of panel A, the main independent variables of interest are a donation dummy for donating to the corresponding type of charities in quarter $t+1$, and income uncertainty, as the standard deviation of the unpredicted component of all realized log monthly payroll income in the last four quarters up to quarter t. In columns (4)-(6) of panel A, the interaction of income uncertainty$_t$ and donation dummy$_{t+1}$ is further added. In panel B, donation dummy$_{t+1}$ is replaces with donation amount$_{t+1}$, the amount donated to the corresponding type of charities in quarter $t+1$. Control variables and fixed effects are the same as in Table A.1. Standardized coefficients are reported for continuous dependent variables. All currency units are converted to USD. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table A.6: Donation Associated with Reduction in Contemporaneous Insurance Expenditures
(Restricting to individuals unlikely to be financially-constrained)

Panel A: Whether donated in the same quarter $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Insurance expenditures$_{t+1}$ ($)					
Charity type	All	Religious	Secular	All	Religious	Secular
Donation dummy$_{t+1}$	-64.44**	-80.86**	-41.62	40.78	60.04	13.00
	(26.81)	(33.71)	(40.36)	(38.50)	(49.73)	(57.39)
Income uncertainty$_t$ ×				-116.57***	-153.11**	-60.84
Donation dummy$_{t+1}$				(44.00)	(60.40)	(56.41)
Income uncertainty$_t$	101.09***	101.01***	100.74***	102.93***	102.52***	101.12***
	(8.32)	(8.31)	(8.31)	(8.39)	(8.38)	(8.32)
Income$_t$	43.37***	43.43***	43.31***	43.07***	43.16***	43.25***
	(9.48)	(9.48)	(9.48)	(9.47)	(9.48)	(9.48)
Financial wealth$_t$	-3.17***	-3.18***	-3.17***	-3.20***	-3.22***	-3.17***
	(1.21)	(1.21)	(1.21)	(1.21)	(1.21)	(1.21)
Age squared	1.15	1.16	1.16	1.16	1.16	1.16
	(0.95)	(0.95)	(0.95)	(0.95)	(0.95)	(0.95)
Married	-52.33	-52.15	-52.44	-52.59	-52.75	-52.35
	(81.53)	(81.53)	(81.53)	(81.53)	(81.53)	(81.53)
Education (baseline: Graduate school and above)						
Undergraduate	-36.12	-35.91	-35.81	-36.31	-36.24	-35.77
	(113.05)	(113.06)	(113.03)	(113.08)	(113.10)	(113.03)
Vocational school	-110.22	-109.48	-110.20	-110.48	-109.62	-110.37
	(169.49)	(169.50)	(169.49)	(169.52)	(169.52)	(169.49)
High school and below	-152.09	-151.69	-151.92	-152.64	-152.37	-151.96
	(117.07)	(117.07)	(117.06)	(117.09)	(117.10)	(117.06)
Occupation (baseline: Public sector officers)						
Agricultural workers	16.47	16.65	15.96	18.04	18.41	16.12
	(251.76)	(251.74)	(251.73)	(251.63)	(251.57)	(251.75)
Blue-collar workers	-59.86	-59.49	-60.16	-59.27	-58.76	-60.14
	(237.66)	(237.65)	(237.71)	(237.61)	(237.58)	(237.71)
White-collar workers	-36.05	-35.65	-36.26	-35.19	-34.80	-36.20
	(244.22)	(244.21)	(244.27)	(244.18)	(244.14)	(244.28)
Service-sector workers	-95.68	-94.85	-96.11	-94.31	-93.03	-96.15
	(243.86)	(243.85)	(243.91)	(243.81)	(243.78)	(243.92)
Owner-managers	-57.81	-57.39	-58.36	-56.86	-55.58	-58.71
	(273.98)	(273.98)	(274.03)	(273.94)	(273.93)	(274.03)
Executives	-11.76	-11.21	-12.65	-10.74	-10.05	-12.86
	(250.82)	(250.82)	(250.87)	(250.78)	(250.75)	(250.88)
Others	62.23	62.77	61.70	62.58	63.42	61.78
	(268.65)	(268.65)	(268.69)	(268.61)	(268.59)	(268.70)
Dependents (baseline: No dependent)						
One dependent	-350.90	-351.38	-350.02	-349.61	-348.53	-350.46
	(373.99)	(374.00)	(374.00)	(374.01)	(374.05)	(374.00)
Two dependents	101.83	101.89	102.29	105.38	106.02	102.50
	(89.49)	(89.52)	(89.48)	(89.48)	(89.49)	(89.49)
More than two dependents	131.50	132.22	132.25	132.86	133.41	132.46
	(167.39)	(167.38)	(167.38)	(167.39)	(167.39)	(167.38)
Constant	-1,594.35	-1,599.69	-1,596.41	-1,593.72	-1,594.93	-1,597.57
	(1,389.12)	(1,389.04)	(1,389.08)	(1,389.13)	(1,389.08)	(1,389.14)
Observations	271,624	271,624	271,624	271,624	271,624	271,624
R^2-Adjusted	0.130	0.130	0.130	0.130	0.130	0.130
Mean(Insur. exp.$_{t+1}$)	$121.63	$121.63	$121.63	$121.63	$121.63	$121.63
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City →, es quarter FE	YES	YES	YES	YES	YES	YES

Panel B: Donation amount in the same quarter $(t+1)$

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Insurance expenditures$_{t+1}$ ($)					
Charity type	All	Religious	Secular	All	Religious	Secular
Donation amount$_{t+1}$	-3.23**	-5.00**	-1.04	2.91	3.19	2.40
	(1.37)	(2.17)	(4.62)	(3.31)	(4.32)	(5.55)
Income uncertainty$_t$ ×				-6.19**	-8.03**	-3.60
Donation dummy$_{t+1}$				(2.59)	(3.34)	(4.53)
Income uncertainty$_t$	100.81***	100.80***	100.66***	101.72***	101.47***	100.89***
	(8.31)	(8.31)	(8.31)	(8.34)	(8.33)	(8.31)
Income$_t$	43.34***	43.37***	43.33***	43.25***	43.32***	43.30***
	(9.48)	(9.48)	(9.48)	(9.48)	(9.48)	(9.48)
Financial wealth$_t$	-3.17***	-3.17***	-3.17***	-3.18***	-3.18***	-3.17***
	(1.21)	(1.21)	(1.21)	(1.21)	(1.21)	(1.21)
Age squared	1.24	1.24	1.24	1.24	1.24	1.24
	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)
Married	-115.12	-115.04	-115.21	-115.07	-115.18	-115.08
	(119.99)	(119.99)	(120.00)	(119.99)	(119.99)	(119.98)
Education (baseline: Graduate school and above)						
Undergraduate	25.18	25.40	25.36	25.12	25.34	25.35
	(1,740.89)	(1,740.86)	(1,740.90)	(1,740.89)	(1,740.87)	(1,740.91)
Vocational school	-330.63	-330.30	-330.65	-330.58	-330.13	-330.70
	(1,717.97)	(1,717.96)	(1,718.01)	(1,717.97)	(1,717.96)	(1,718.03)
High school and below	-755.09	-754.81	-754.88	-755.18	-754.79	-754.95
	(1,889.15)	(1,889.12)	(1,889.17)	(1,889.16)	(1,889.13)	(1,889.19)
Occupation (baseline: Public sector officers)						
Agricultural workers	228.89	229.10	228.58	229.32	229.32	228.78
	(344.97)	(344.95)	(344.95)	(344.94)	(344.89)	(344.98)
Blue-collar workers	-204.31	-204.03	-204.47	-204.44	-204.11	-204.51
	(252.95)	(252.96)	(252.98)	(252.95)	(252.94)	(252.99)
White-collar workers	-133.48	-133.19	-133.57	-133.46	-133.16	-133.56
	(248.01)	(248.01)	(248.03)	(248.00)	(247.99)	(248.04)
Service-sector workers	-947.56	-947.08	-947.89	-947.20	-946.65	-947.87
	(902.60)	(902.60)	(902.66)	(902.58)	(902.61)	(902.66)
Owner-managers	-190.14	-189.75	-190.42	-189.99	-188.92	-190.80
	(314.90)	(314.90)	(314.93)	(314.89)	(314.89)	(314.96)
Executives	-65.96	-65.36	-66.21	-66.38	-65.04	-66.69
	(276.83)	(276.83)	(276.89)	(276.84)	(276.81)	(276.94)
Others	534.57	534.84	534.17	534.93	534.84	534.45
	(586.00)	(585.99)	(585.97)	(586.01)	(585.98)	(586.02)
Dependents (baseline: No dependent)						
One dependent	-349.67	-350.06	-349.33	-348.56	-348.27	-349.61
	(341.83)	(341.83)	(341.83)	(341.84)	(341.89)	(341.84)
Two dependents	80.33	80.26	80.61	81.61	81.79	80.62
	(86.30)	(86.30)	(86.29)	(86.28)	(86.30)	(86.29)
More than two dependents	346.63	347.09	347.01	346.96	347.37	347.10
	(366.37)	(366.36)	(366.37)	(366.36)	(366.35)	(366.37)
Constant	-1,536.32	-1,539.92	-1,539.67	-1,538.27	-1,541.08	-1,540.53
	(1,590.00)	(1,589.74)	(1,590.13)	(1,589.90)	(1,589.71)	(1,590.04)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Mean(Insur. exp.$_{t+1}$)	$242.01	$242.01	$242.01	$242.01	$242.01	$242.01
Control variables	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
City × quarter FE	YES	YES	YES	YES	YES	YES

Notes: This table reports results examining the substitutability between donations and insurance purchases for the sample unlikely to be cash-constrained. We consider the individual as unlikely to be constrained if she has income to spare in every month, after the observed expenditure on consumption and the maximum of (1) the observed expenditure and (2) the sample conditional average expenditure on donations and on insurance purchase. Specifically, we subtract from an individual's income in each month the sum of (1) the observed consumption in the month, (2) the maximum monthly amount spent on insurance over the sample period for the individual or the sample conditional average insurance purchase amount (whichever is greater) and (3) the maximum monthly amount spent on donations over the sample period for the individual or the sample conditional average donation amount (whichever is greater). The dependent variable is the amount of insurance purchased in the current quarter. All other model setup is the same as in Table 5.

Table A.7: Consumption Not Associated with Reduction in Contemporaneous Insurance Expenditures
(Placebo test for Table 5.)

Panel A: Whether high-spent in the same quarter $(t+1)$					
	(1)	(2)	(3)	(4)	(5)
Dependent variable	Insurance expenditures$_{t+1}$ ($)				
High-spending dummy$_{t+1}$	-7.67	-30.39	-9.76	-5.73	-39.12
	(9.74)	(26.19)	(36.36)	(23.58)	(103.99)
Income uncertainty$_t$ ×	6.56	14.89	-6.98	13.41	-26.82
High-spending dummy$_{t+1}$	(17.24)	(15.54)	(29.86)	(31.11)	(87.11)
Income uncertainty$_t$	82.35***	81.54***	86.90***	85.10***	86.33***
	(13.70)	(19.33)	(17.21)	(20.09)	(19.68)
Income$_t$	64.94***	64.92***	64.82***	64.94***	64.83***
	(24.45)	(24.50)	(24.37)	(24.53)	(24.50)
Observations	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215
High spending over __ percentile	50th	75th	90th	95th	99th
Dep. var. mean	$242.01	$242.01	$242.01	$242.01	$242.01
Control variables	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES	YES
Panel B: High-spent amount in the same quarter $(t+1)$					
	(1)	(2)	(3)	(4)	(5)
Dependent variable	Insurance expenditures$_{t+1}$ ($)				
High-spending amount$_{t+1}$	-14.93	-14.92	-12.61	-12.56	-14.06
	(17.89)	(17.65)	(17.36)	(17.37)	(19.20)
Income uncertainty$_t$ ×	2.48	2.48	1.39	1.70	2.20
High-spending amount$_{t+1}$	(4.26)	(4.14)	(4.07)	(4.16)	(4.98)
Income uncertainty$_t$	83.26***	83.57***	84.84***	84.90***	85.24***
	(20.07)	(20.10)	(19.82)	(19.79)	(19.64)
Income$_t$	64.85***	64.82***	64.80***	64.83***	64.88***
	(24.49)	(24.49)	(24.49)	(24.50)	(24.50)
Observations	296,092	296,092	296,092	296,092	296,092
R^2-Adjusted	0.215	0.215	0.215	0.215	0.215
High spending over __ percentile	50th	75th	90th	95th	99th
Dep. var. mean	$242.01	$242.01	$242.01	$242.01	$242.01
Control variables	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES	YES

Notes: The table reports the estimates of robustness check regression, in which donation in Table 5 are replaced by high-spending consumption. The dependent variable is the total amount of insurance purchases for the current quarter. Income uncertainty is the standard deviation of all observations of log monthly payroll income in the previous four quarters, after residualizing from the income measure the part that can be accounted for by demographic background variables and time fixed effects. High-spending dummy variables in Columns (1) to (5) represent whether the individual experience consumption over the 50th, 75th, 90th, 95th, and 99th percentile in the same quarter as insurance purchases, respectively. Consumption is measured in thousands of USD. All other model setup is the same as in Table 5.

Table A.8: Mutual Insurance: Does Donations Improve the Degree of Consumption Insurance?

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variables	Consumption (Year 2 - Year 1)					
Donation type	If donated in Year 1			Donation Amount in Year 1		
	Any donation	*Religious donation*	*Secular donation*	*Any donation*	*Religious donation*	*Secular donation*
Income (Year 2 - Year 1) × Donation	0.01	0.02	0.01	0.00	0.00	0.00
	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)
Income (Year 2 - Year 1)	0.03***	0.03***	0.03***	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Donation	348.21*	193.83	453.62*	0.45	0.41	0.67
	(189.55)	(245.92)	(267.58)	(0.41)	(0.43)	(0.86)
Control variables	YES	YES	YES	YES	YES	YES
Observations	74,023	74,023	74,023	74,023	74,023	74,023
R^2-Adjusted	0.01	0.01	0.01	0.01	0.01	0.01

Notes: This table reports how donation behavior affects the consumption pass-through of income fluctuations, and is a replication of Dehejia, DeLeire, and Luttmer (2007). The dependent variable is the difference between the consumption in the second year and the consumption in the first year. The independent variables include the difference between the income in the second year and the income in the first year, donation behaviors of the first year and control variables. Donation behaviors in columns (1)-(3) are dummy variables indicating whether at least a donation, religious donation, or secular donation occurs in the first year, respectively. Donation behaviors in columns (4)-(6) are the amounts of donation, religious donation, and secular donation made in the first year. Control variables include demographic background variables and financial wealth (in logarithms) in the first year. Demographic variables are age, the square of age, educational attainment, occupational type, marital status, and the number of dependents at the current month. All currency units are converted to USD at the exchange rate. Standard errors are clustered at the individual level and are reported beneath the estimated coefficient within parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table A.9: Income Uncertainty Predicts Donation
(Further excluding conventional bonus-dispersing months when computing income uncertainty)

Panel A: Probability of donation $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Pr(donation$_{t+1}$					
Specification	OLS	OLS	OLS	IV	IV	IV
Income uncertainty$_t$	0.51***	0.52***	0.51***	2.33***	2.43***	2.43***
	(0.05)	(0.05)	(0.05)	(0.70)	(0.74)	(0.77)
Income$_t$		0.02	-0.01		0.11*	0.11
		(0.06)	(0.06)		(0.07)	(0.07)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	507.0	461.0	425.6
R^2-Adjusted	0.383	0.383	0.383	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel B: Donation amount $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Donation amount$_{t+1}$					
Specification	OLS	OLS	OLS	IV	IV	IV
Income uncertainty$_t$	0.42***	0.42***	0.40***	2.62***	2.75***	2.72**
	(0.05)	(0.05)	(0.05)	(0.97)	(1.03)	(1.07)
Income$_t$		-0.03	-0.05		0.16*	0.16*
		(0.06)	(0.06)		(0.09)	(0.09)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	507.0	461.0	425.6
R^2-Adjusted	0.402	0.402	0.402	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES

Notes: Here, we conduct an additional robustness check where we stringently exclude payroll observations from traditional bonus months (January, February, July) in our computation of income uncertainty, to recognize that bonuses, customarily paid in these few months, constitute a particular seasonal component of income. While we view as plausible that individuals may do good deeds to sway blessings in a favorable bonus outcome, this additional robustness check is to ensure that our results are not purely driven by the seasonality of bonuses. The dependent variable is total donation during the current quarter. The independent variable income uncertainty is the standard deviation of residual log monthly payroll income in the past four quarters after removing these months where bonuses are traditionally dispersed (January, February, July). All other model setup is the same as in Table 2.

Table A.10: Income Uncertainty Predicts Donation
(Controlling for tax considerations)

Panel A: Probability of donation $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Pr(donation$_{t+1}$)			
Specification	OLS	OLS	OLS	IV	IV	IV
Panel A.1: Marginal tax rates calculated by extrapolating monthly income						
Income uncertainty$_t$	0.71%***	0.70%***	0.70%***	1.88%***	1.91%***	1.90%***
	(0.06%)	(0.06%)	(0.06%)	(0.56%)	(0.59%)	(0.60%)
Income$_t$		-0.03	-0.03		0.05	0.05
		(0.04)	(0.04)		(0.06)	(0.06)
Price of giving	-0.25	-0.46	-0.34	-0.87	-0.53	-0.41
	(0.48)	(0.56)	(0.56)	(0.57)	(0.59)	(0.60)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	401.62	388.94	373.93
R2-Adjusted	0.384	0.384	0.384	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City $\times$ quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel A.2: Marginal tax rates calculated by using ex-post annual income						
Income uncertainty$_t$	0.53***	0.52***	0.53***	2.11***	2.17***	2.13**
	(0.06)	(0.06)	(0.06)	(0.78)	(0.81)	(0.83)
Income$_t$		0.01	0.02		0.13*	0.13*
		(0.04)	(0.04)		(0.07)	(0.08)
Price of giving	0.13	0.28	0.43	-0.63	0.30	0.46
	(0.48)	(0.57)	(0.57)	(0.65)	(0.60)	(0.60)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	401.62	388.94	373.93
R2-Adjusted	0.402	0.402	0.402	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City $\times$ quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel B: Donation amount $(t+1)$						
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable			Donation amount$_{t+1}$			
Specification	OLS	OLS	OLS	IV	IV	IV
Panel B.1: Marginal tax rates calculated by extrapolating monthly income						
Income uncertainty$_t$	0.70***	0.69***	0.69***	1.86***	1.92***	1.90***
	(0.06)	(0.06)	(0.06)	(0.56)	(0.59)	(0.61)
Income$_t$		-0.04	-0.04		0.07	0.07
		(0.04)	(0.04)		(0.06)	(0.06)
Price of giving	-1.33	-1.71	-1.77	-0.76	-0.05	-0.12
	(1.06)	(1.22)	(1.32)	(1.04)	(1.32)	(1.34)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	402.22	393.98	378.73
R2-Adjusted	0.384	0.384	0.384	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10	\$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES

City × quarter fixed effect	NO	NO	YES	NO	NO	YES
Panel B.2: Marginal tax rates calculated by using ex-post annual income						
Income uncertainty$_t$	0.53***	0.52***	0.52***	2.09***	2.17***	2.13**
	(0.06)	(0.06)	(0.06)	(0.77)	(0.82)	(0.84)
Income$_t$		-0.02	-0.02		0.12	0.12
		(0.04)	(0.04)		(0.08)	(0.08)
Price of giving	-1.51	-1.73	-1.83	-0.97	0.30	0.16
	(1.15)	(1.24)	(1.25)	(1.17)	(1.46)	(1.49)
Observations	296,092	296,092	296,092	273,616	273,616	273,616
First-stage F-stat.	/	/	/	402.22	393.98	378.73
R2-Adjusted	0.402	0.402	0.402	/	/	/
Mean Pr(Donation$_{t+1}$)	1.46%	1.46%	1.46%	1.46%	1.46%	1.46%
Cond. Mean(Dona. Amt$_{t+1}$)	$97.10	$97.10	$97.10	$97.10	$97.10	$97.10
Control variables	NO	YES	YES	NO	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
Quarter fixed effect	YES	YES	YES	YES	YES	YES
City × quarter fixed effect	NO	NO	YES	NO	NO	YES

Notes: This table reports the predictive effect of income uncertainty on donations controlling for tax considerations, to address the potential that income uncertainty may be correlated with the price of giving. The donations in our dataset are eligible for tax exemption, making the price of giving effectively one minus the marginal tax rate. Panels A.1 and B.1 report the imputed marginal tax rates based on extrapolating based on monthly payroll income, multiplied by twelve, to estimate annual income, and Panels A.2 and B.2 report the imputed marginal tax rates based on utilizing ex-post annual income for those with a complete calendar year in our dataset. For others, we extrapolated annual income using all available monthly income data, applying aggregate seasonality adjustment factors. All other model setup is the same as in Table 2.

Table A.11: "Self-fulfilling hypothesis"? Donation Does Not Predict Reduction in Uncertainty (Full set of control coefficients)

	(1)	(2)	(3)
Dependent variable	Income uncertainty$_{year=2}$		
Panel A: Donation dummy and future income uncertainty			
Donation dummy$_{year=1}$	0.04		
	(0.03)		
Religious donation dummy$_{year=1}$		0.04	
		(0.04)	
Secular donation dummy$_{year=1}$			0.06
			(0.04)
Income uncertainty$_{year=1}$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Income$_{year=1}$	0.33***	0.33***	0.33***
	(0.01)	(0.01)	(0.01)
Financial wealth$_{year=1}$	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
Age$_{year=1}$	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Age$_{year=1}$ squared	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)
Female	0.10***	0.10***	0.10***
	(0.01)	(0.01)	(0.01)
Married$_{year=1}$	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)
Education$_{year=1}$ (baseline: Graduate school and above)			
Undergraduate	-0.21***	-0.21***	-0.21***
	(0.01)	(0.01)	(0.01)
Vocational school	-0.22***	-0.22***	-0.22***
	(0.01)	(0.01)	(0.01)
High school and below	-0.26***	-0.26***	-0.26***
	(0.01)	(0.01)	(0.01)
Occupation$_{year=1}$ (baseline: Public sector officers)			
Agricultural workers	-0.24***	-0.24***	-0.24***
	(0.08)	(0.08)	(0.08)
Blue-collar workers	0.05**	0.05**	0.05**
	(0.02)	(0.02)	(0.02)
White-collar workers	0.16***	0.16***	0.16***
	(0.02)	(0.02)	(0.02)
Service-sector workers	0.03	0.03	0.03
	(0.03)	(0.03)	(0.03)
Owner-managers	0.05	0.05	0.05
	(0.04)	(0.04)	(0.04)
Executives	0.09***	0.09***	0.09***
	(0.02)	(0.02)	(0.02)
Others	-0.02	-0.02	-0.02
	(0.03)	(0.03)	(0.03)
Dependents$_{year=1}$ (baseline: No dependent)			
One dependent	0.03*	0.03*	0.03*
	(0.01)	(0.01)	(0.01)
Two dependents	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)
More than two dependents	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)
Constant	-455.33***	-456.04***	-455.95***
	(14.13)	(14.12)	(14.12)
Observations	74,023	74,023	74,023
R^2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES
Panel B: Donation amount and future income uncertainty			
Donation amount$_{year=1}$	0.00		
	(0.05)		
Religious donation amount$_{year=1}$		-0.01	
		(0.09)	
Secular donation amount$_{year=1}$			0.01
			(0.10)
Income uncertainty$_{year=1}$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Income$_{year=1}$	0.33***	0.33***	0.33***

	(0.01)	(0.01)	(0.01)
Financial wealth$_{year=1}$	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)
Age$_{year=1}$	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Age$_{year=1}$ squared	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)
Female	0.10***	0.10***	0.10***
	(0.01)	(0.01)	(0.01)
Married$_{year=1}$	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)
Education$_{year=1}$ (baseline: Graduate school and above)			
Undergraduate	-0.21***	-0.21***	-0.21***
	(0.01)	(0.01)	(0.01)
Vocational school	-0.22***	-0.22***	-0.22***
	(0.01)	(0.01)	(0.01)
High school and below	-0.26***	-0.26***	-0.26***
	(0.01)	(0.01)	(0.01)
Occupation$_{year=1}$ (baseline: Public sector officers)			
Agricultural workers	-0.24***	-0.24***	-0.24***
	(0.08)	(0.08)	(0.08)
Blue-collar workers	0.05**	0.05**	0.05**
	(0.02)	(0.02)	(0.02)
White-collar workers	0.16***	0.16***	0.16***
	(0.02)	(0.02)	(0.02)
Service-sector workers	0.03	0.03	0.03
	(0.03)	(0.03)	(0.03)
Owner-managers	0.05	0.05	0.05
	(0.04)	(0.04)	(0.04)
Executives	0.09***	0.09***	0.09***
	(0.02)	(0.02)	(0.02)
Others	-0.02	-0.02	-0.02
	(0.03)	(0.03)	(0.03)
Dependents$_{year=1}$ (baseline: No dependent)			
One dependent	0.03*	0.03*	0.03*
	(0.01)	(0.01)	(0.01)
Two dependents	-0.00	-0.00	-0.00
	(0.01)	(0.01)	(0.01)
More than two dependents	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)
Constant	-456.61***	-456.70***	-456.62***
	(14.13)	(14.12)	(14.13)
Observations	74,023	74,023	74,023
R^2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES

Notes: This table reports the full set of coefficients of regressions examining the association between donation and future income uncertainty. The dependent variable is individual income uncertainty in the second half of the sample ($year = 2$), measured as the standard deviation of the unpredicted component of all realized log monthly payroll income in the second year of the two-year sample. In panel A, the independent variables of interest are a donation dummy for donating to the corresponding type of charities in $year = 1$, the first year of the two-year sample, and income uncertainty in $year = 1$. In panel B, donation dummy$_{year=1}$ is replaces with donation amount$_{year=1}$, the amount donated to the corresponding type of charities in $year = 1$. Control variables include log income in $year = 1$, log financial wealth in $year = 1$, and demographic variables that include age, age squared, educational attainment, occupational type, marital status, and the number of dependents. Standardized coefficients are reported for continuous dependent variables. Standard errors are clustered at the individual level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table A.12: The Field Experiment: Balance Tests

Covariate	Mean		T-Statistic/Chi-Squared	*p*-Value
	Control	Treated		
Age	38.168	38.179	-1.323	0.186
Hist. visit case	35.848	35.850	-0.054	0.957
Hist. donate case	4.489	4.504	-1.466	0.143
Hist. donate amt.	18.159	18.208	-1.159	0.246
Last month visited(=1)	37.6%	37.6%	0.121	0.121
Last month visited case	0.667	0.666	0.931	0.352
Last month donated count	0.078	0.078	-1.641	0.101
Last month donated amt.	0.311	0.313	-0.702	0.483
Anonymous donation count	0.109	0.107	0.971	0.332
Anonymous donation amt.	0.198	0.200	-0.767	0.443
Campaign target amt.	42141.2	42175.3	-1.659	0.097
Campaign target amt. (log)	10.649	10.650	-1.357	0.175
Campaign word count	848.495	848.051	1.424	0.154
Campaign picture count	7.389	7.386	0.963	0.336
Patient age	39.619	39.591	1.466	0.143
Patient gender(=Male)	61.2%	61.2%	0.145	0.145
Insurance coverage(=Yes)	90.1%	90.1%	0.470	0.638
Cancer(=Yes)	25.4%	25.5%	0.216	0.829
Same city(=Yes)	31.9%	31.8%	0.832	0.405
Channel(=Timeline posts)	84.0%	84.0%	0.555	0.579

Notes: This table presents the balance test results for the field experiment on Platform X examining the effect of spiritual narratives on the likelihood to donate. Sample balance was tested between observations from the treatment group and control group potential donors. We report group means, t-statistics for continuous variables or Chi-squared statistics for binary variables, and the corresponding p-values. All currency units are converted to USD at the exchange rate.

Table A.13: Religious and Secular Donations: Adjusting for Multiple Hypothesis Testing

Religious v.s. secular hypotheses (null hypothesis is no difference)	Coeff. difference	*p*-values for one-sided tests of the null hypothesis (H0)	
		Unadjusted	Romano-Wolf adjusted
Predictive effect of income uncertainty on religious versus secular donation probability (Table 3, higher is stronger effect)	0.23%	0.000***	0.004***
Predictive effect of income uncertainty on religious versus secular donation amount (Table 3, higher is stronger effect)	0.11	0.026**	0.049**
Predictive effect of health shocks on religious versus secular donation probability (Table 4, higher is stronger effect)	2.30%	0.000***	0.002***
Predictive effect of health shocks on religious versus secular donation amount (Table 4, higher is stronger effect)	1.87	0.000***	0.002***
Association with insurance expenditure for incidence of religious versus secular donation (Table 5, lower is more substitutable)	-44.59	0.186	0.213
Association with insurance expenditure for amount of religious versus secular donation (Table 5, lower is more substitutable)	-4.40	0.186	0.249

Note: This table reports the unadjusted p-values for the difference between the coefficients on religious and secular contributions in Tables 3, 4, and 5 and the p-values after adjusting for multiple hypothesis testing using the Romano-Wolf method. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.