Hedging by Giving: Spiritual Insurance and Religious Donations

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Motivation I: Household Finance

- We seek to provide the first large-scale study examining the hypothesis that religious giving, through a "spiritual insurance" mentality, serves as a non-traditional tool for household risk hedging

- Throughout history, humans often turned to religion when facing uncertainty

  - Before sailing, ancient Greek and ancient Chinese sailors would worship Poseidon and Mazu, respectively
  - "Whoever is kind to the poor lends to the LORD, and will be repaid in full." Proverbs 19:17
  - "What goes around comes around." Buddhism proverb

People in China compete to burn first incense and make religious donation at New Year
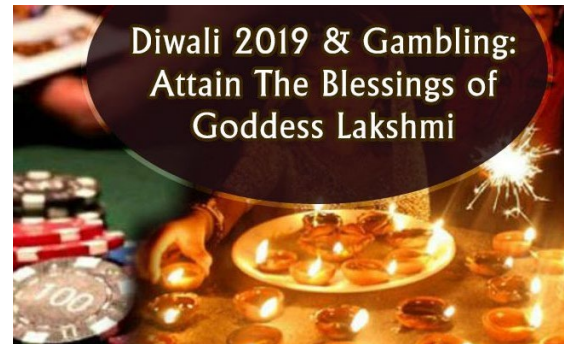
Hinduism believes that gambling will be blessed by Goddess Lakshmi if making a religious donation on Diwali

Paula White, Trump's spiritual advisor, prayed to God for Trump's re-election (Unsuccessfully ☹)

- These examples illustrate the mentality we call "spiritual insurance", that people donate for blessings from their gods and hedge income uncertainty spiritually, believing that good deeds will be rewarded by the super nature.
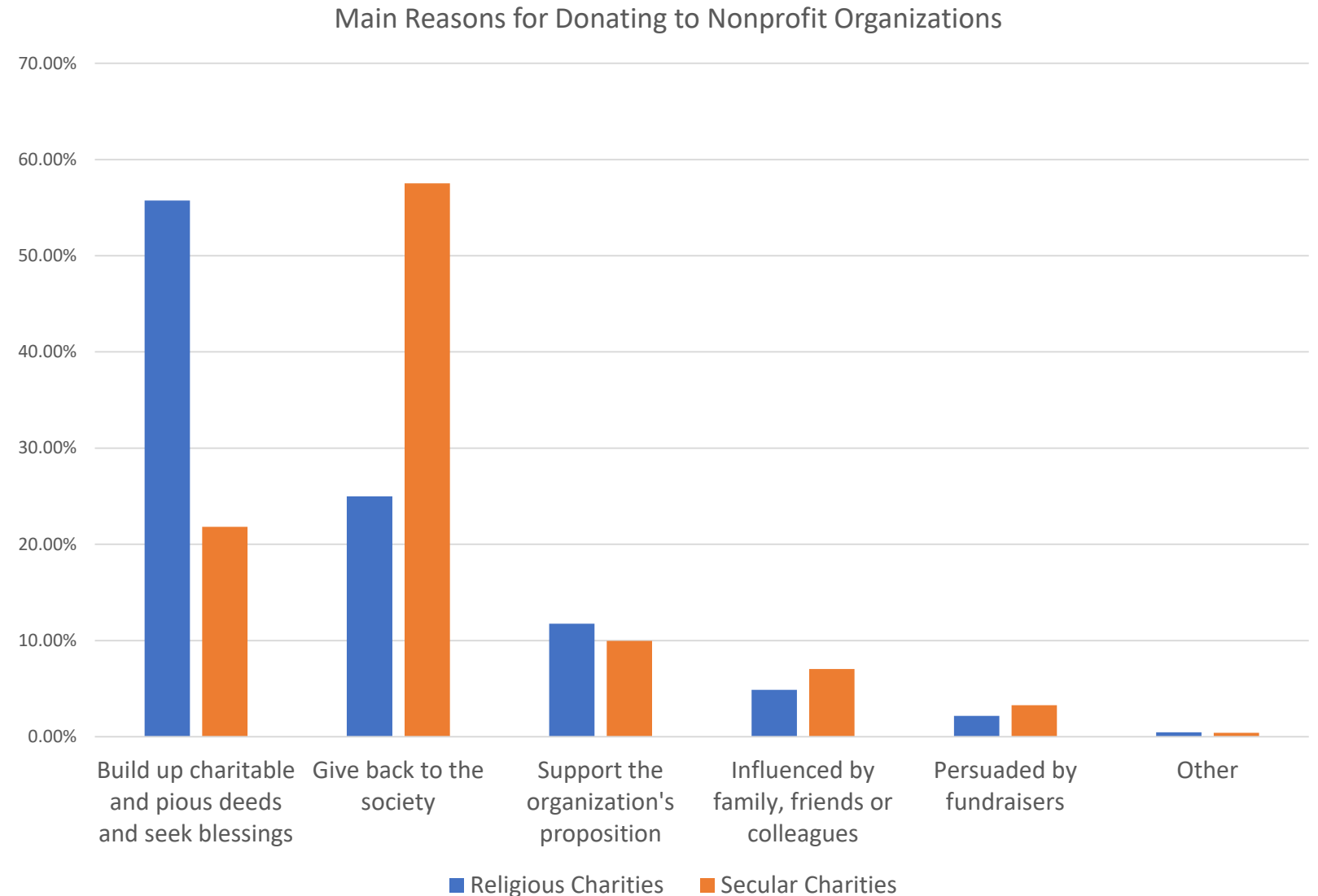
Motivation II: Charitable Giving

- Charitable giving constitutes an important sector of the economy:
  - It has accounted for 2.3% of U.S. GDP (Giving USA, 2021)

- Religious giving is an essential part of charitable giving:
  - 28% of donations in the U.S. go to religion, taking the largest share (Giving USA, 2021).
  - Religious giving account for 40% of all giving in Canada, also the largest share (Lasby and Barr, 2018).
  - Over 50% of the donators donated to religious recipients in Taiwan, our sample economy.

- Charitable giving is "sticky downwards" in cyclicality:
  - It is much more sensitive to increases than decreases in macroeconomic and financial indicators, such as GDP and the S&P500 (List, 2011)

- Does "donating for blessings" help understand (1) the cyclicality of giving (uncertainty in downturns) and (2) the importance of religious giving (dampens secularization)?

What We Do

- We analyze **unique data** on income uncertainty, insurance spending, and religious donations based on transactions from a leading bank in Taiwan.

- We examine whether **background risk** predicts more **donations**, which conflicts with the traditional motivation for donations, but is consistent with **spiritual insurance**.

- We examine **conditional on donating**, whether people **buy less insurance**, and whether their insurance spending's **relationship with background risks changes**.

- We examine and discuss whether our findings are consistent**uniquely** with "spiritual insurance", or with other channels such as mutual insurance or increased altruism.

- We examine **external validity** by analyzing a **field donation experiment** on "spiritual narratives" on a large online platform in mainland China

Anecdotal Evidence: Survey-stated "Donating for Blessings" Motives

- The **2003 Taiwan census** asked this question: **What are the main reasons why you donate?**

- Result:

- **"Seek blessing" (55.7%)** is the **1st** most stated reason for **religious donations**

- **"Seek blessing" (21.8%)** is the **2nd** most stated reason for **secular donations**
  - The 2021 APA-Taiwan Survey on secular donators reaffirms this result (21.4%)

Main Reasons for Donating to Nonprofit Organizations

Legend: ■ Religious Charities ■ Secular Charities

Source: 2003 Taiwan Census.

Model Sketch and Testable Hypotheses

- Income uncertainty: good state, neutral state, and bad state

- **Spiritual insurance motive**: donation reduces the perceived probability of the bad state

- Whether or not there is a spiritual insurance motive, optimal donation rises with **expected income**: cannot distinguish the spiritual insurance motive by **expected income**

- Without spiritual insurance motive: optimal donation **decreases** with **income uncertainty**
  With a strong spiritual insurance motive: optimal donation **increases** with **income uncertainty**

- **Extended model with 2-d risks**: Introduce expense uncertainty and insurance purchase.
  - Donating more associates with reduced purchase of insurance by reducing the marginal benefit of insurance

Data

- We use a proprietary dataset from a leading commercial bank (the Bank) in Taiwan.

- The data consist of detailed transaction records, monthly balances for all types of accounts, and demographic information for each consumer.

- The raw data include approximately 1.6 million clients for two years **from July 2013 through June 2015**. We focus on clients who receive their salaries through the Bank (around 10% of the raw data) and spend through the Bank's credit cards

- We end up with **74,023 individuals** for whom we have records on payroll income, credit card spending, and insurance purchases, for whom we observe credit card donations to religious and secular charities.

- As a unique institution setting of our dataset, all recipient organizations are broad-based charities (not local church)

- Moreover, most religious donations are to charities with an evangelical background.
  - Our results are potentially important where these groups are relevant.

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	Standard deviation	Min	25th percentile	Median	75th percentile	Max
Income (converted to monthly)	$4,067	$30,867	$635	$1,478	$2,200	$3,867	$11,349,309
Financial wealth	$13,600	$35,667	$0	$894	$3,500	$12,667	$3,540,548
Total donation	$97.10	$95.85	$0.03	$50.00	$80.00	$100.00	$3,033.33
Religious donation	$94.39	$102.60	$3.33	$50.00	$70.00	$100.00	$3,033.33
Secular donation	$94.40	$72.54	$0.03	$50.00	$83.33	$100.00	$1,200.00
Insurance	$905.07	$6,143.89	$1.97	$266.67	$433.33	$657.57	$963,227.20
Health expenditure	$72.56	$207.33	$0.07	$18.00	$33.33	$66.67	$18,400.00
Age	36.53	6.99	18	31	36	41	55

			Job position		Public sector officers		Agricultural workers		Blue-collar workers
Gender	Female				0.02		0.00		0.31
	0.46				White-collar workers		Service-sector workers		Executives
Marriage status	Married				0.52		0.04		0.08
	0.32				Owner-managers		Others		
Education	Graduate school and above	Undergraduate			0.01		0.02		
	0.14	0.38		Dependents	No dependent		One dependent		
	Vocational school	High school and below			0.87		0.05		
	0.20	0.29			Two dependents		More than two dependents		
					0.07		0.01		

Measuring Income Uncertainty in the Payroll Dataset

- Following Meghir and Pistaferri (ECMA '04) and Jurado, Ludvigson and Ng (AER '15), **we first remove the anticipated part of income, leaving only the unanticipated part of income**.

$$\log\left(income\right)_{im} = \alpha + X'_{im}\beta + \mu_m + \varepsilon_{im}$$

- where X_{im} denotes the demographic characteristics of the individual *i* in month *m*, including city of residence, age, square of age, gender, marital status, educational level, occupation and number of dependents, and μ_m denotes the time fixed effect.

- We only use ε_{im}, thus capturing the unpredicted component of income that is uncertainty.
  - Nevertheless, we find robust results if we use raw income or income growth rate.

Measuring Income Uncertainty in the Payroll Dataset

- **We then compute the income uncertainty measure,** as the standard deviation of residual log payroll income in the immediate past period M_{t-1}. **Specifically, for each individual-quarter:**

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

- where the immediate past period M_{t-1}, is taken to be **all months of the previous four quarters in our baseline.**
  - all our results are robust to using a shorter M_{t-1} of three or two quarters.
- calculating income uncertainty using recent past data is similar to studies on how uncertainty from the firm affects individual consumption (Alfaro and Park 2020; Di Maggio et al. 2022), which measure uncertainty using realized stock market volatility.

Main Finding: Income Uncertainty Predicts Donations

- In our first main test, we examine the **whether the income uncertainty an individual recently experienced predict the individual's donations**. The data is at the individual-quarter level.

$$donation_{i,t+1} = \beta_1 income\,uncertainty_{i,t} + X_{i,t}'\gamma + \mu_t + \lambda_i + \varepsilon_{it}$$

- We employ time and individual fixed effects, thus focusing solely on **within-person variations**, comparing an individual when experiencing higher income uncertainty with the same individual when experiencing lower income uncertainty.

- Control variables: We further include log level of income, log financial wealth, age, the square of age, and dummies of educational attainment, occupational type, marital status, and the number of dependents. We cluster at the individual level.

Main Finding: Income Uncertainty Predicts More Donations

	(1)	(2)	(3)
Dependent variables	All donations$_{t+1}$	All donations$_{t+1}$	All donations$_{t+1}$
Specifications	OLS	OLS	OLS
Income uncertainty$_t$	0.53***	0.52***	0.52***
	(0.06)	(0.06)	(0.06)
Income$_t$		0.01	0.02
		(0.06)	(0.06)
Observations	296,092	296,092	296,092
R2-Adjusted	0.402	0.402	0.402
Dep. var. mean	1.42	1.42	1.42
Control variables	NO	YES	YES
Individual FE	YES	YES	YES
Quarter FE	YES	YES	YES
City × quarter FE	NO	NO	YES

37% increase

Main Finding: Income Uncertainty Predicts More Donations

- One standard deviation increase of income uncertainty leads to an average increase of donation by US$0.52, amounting to 37% of the sample unconditional mean of quarterly donations of US$1.42.

- **Finding 1: We find that in within-person variations, higher background risk predicts more donations.**

Main Finding: Income Uncertainty Predicts Donations (IV Approach)

$$donation_{i,t+1} = \beta_1 income\,uncertainty_{i,t} + X'_{i,t}\gamma + \mu_t + \lambda_i + \varepsilon_{it}$$

- Interpretation of Finding 1 could be potentially complicated by two issues:
  - First, the income uncertainty variable might be subject to measurement errors.
  - Second, the income uncertainty may reflect both labor supply choices and income risk factors external to the employee

- To address these concerns, we use the **firm-level average income uncertainty** as an instrument for individual-level income uncertainty.
  - We focus on individuals employed in firms with 10 or more employees to ensure the instrument is meaningful.

- This instrument effectively concentrates the predictive estimation on variations in income uncertainty driven by firm-level dynamics, external to the employee, thereby supporting the plausibility of the exclusion restriction.

Main Finding: Income Uncertainty Predicts More Donations (IV Approach)

Dependent variables	(1) All donations$_{t+1}$	(2) All donations$_{t+1}$	(3) All donations$_{t+1}$
Specifications	IV	IV	IV
Income uncertainty$_t$	1.99***	2.06***	2.02***
	(0.73)	(0.76)	(0.78)
Income$_t$		0.11	0.11
		(0.07)	(0.07)
Observations	273,616	273,616	273,616
First-stage F-stat	423.9	415.6	400.3
Dep. var. mean	1.42	1.42	1.42
Control variables	NO	YES	YES
Individual FE	YES	YES	YES
Quarter FE	YES	YES	YES
City × quarter FE	NO	NO	YES

142% increase

Main Finding: Income Uncertainty Predicts More Donations (IV Approach)

- Instrumental variable estimates suggest that one standard deviation increase of income uncertainty leads to an average increase of donation by US$2.02, amounting to 142% of the sample unconditional mean of quarterly donations of US$1.42, and confirms our **Finding 1: that we find that in within-person variations, higher background risk predicts more donations.**

- We also report that the spiritual insurance effect mostly comes from **extensive margin**:
  - Individuals are more likely to donate when experienced high income uncertainty, whereas the conditional donation amt. is similar to the sample conditional mean (approx $95)

Mechanism: Donation and Spiritual Insurance

- Finding 1: Spiritual insurance influences donation behavior.

- Unanswered questions:
  - Do we observe stronger effects on religious organizations vs. secular charities?
  - Do uncertainty in the negative side drive our effects?
  - Do people substitute between insurance purchases and religious donations?

- Dataset enables further tests to address these questions and distinguish model predictions with spiritual insurance channel.

Mechanism: Donation and Spiritual Insurance

- Test 1: Religious and Secular Donation

- Recall that from survey-stated giving motivations in the 2003 Taiwan census

- Religious donations: 55.8% for "seeking blessings", 25.0% for "giving back to society"
- Secular donations: 57.5% for "giving back to society", 21.8% for " seeking blessings"
- Different primary purposes for religious and secular donations

- but spiritual insurance is important for both religious and secular donations;
- religious donations may have stronger spiritual insurance behavior.

Main Reasons for Donating to Nonprofit Organizations
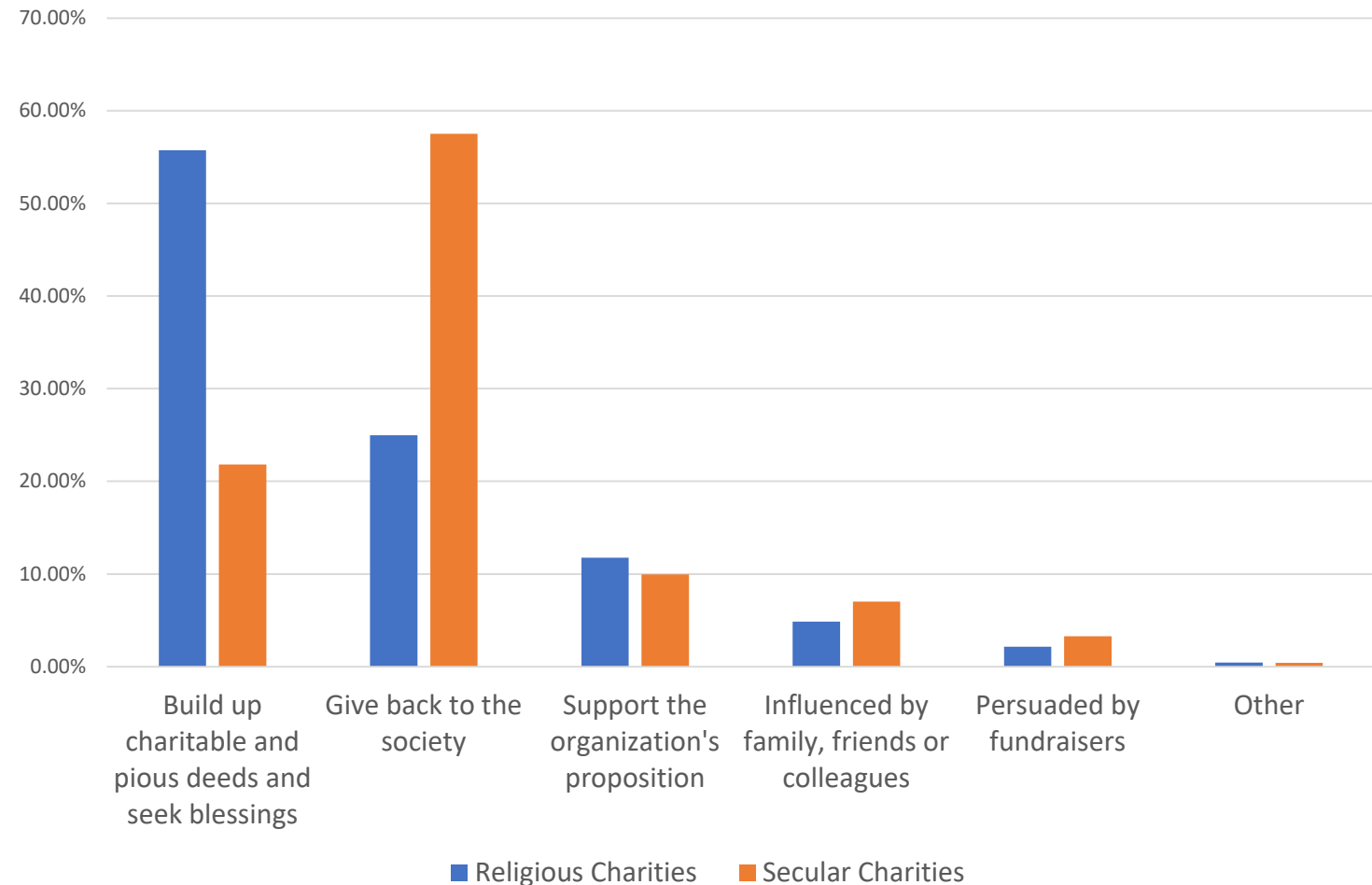
Source: 2003 Taiwan census.

Mechanism: Donation and Spiritual Insurance

	(1)	(2)	(3)	(4)
Dependent variables	Religious donation$_{t+1}$	Religious donation$_{t+1}$	Secular donation$_{t+1}$	Secular donation$_{t+1}$
Specifications	OLS	OLS	OLS	OLS
Income uncertainty$_t$	0.32***		0.21***	
	(0.04)		(0.04)	
Positive uncertainty$_t$		0.13***		0.07***
		(0.02)		(0.03)
Negative uncertainty$_t$		0.19***		0.14***
		(0.05)		(0.04)
Income$_t$	0.03	0.03	-0.05	-0.05
	(0.05)	(0.05)	(0.04)	(0.04)
Observations	296,092	296,092	296,092	296,092
R2-Adjusted	0.368	0.368	0.444	0.444
Dep. var. mean	0.84	0.84	0.58	0.58
Control variables	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES

Mechanism: Donation and Spiritual Insurance

- When income uncertainty rises by one standard deviation, religious donations increase by $0.32 over the next quarter; whereas secular donations increase by $0.21.
- The predictive effect of income uncertainty on religious donations is 54% larger than secular donations, consistent with the more prevalent "donating for blessings" survey-stated giving motive of religious donations compared to secular donations.

Mechanism: Donation and Spiritual Insurance

- Test 2: positive v.s. negative shock

  - Down-side income risk

  - Health shock

Mechanism: Donation and Spiritual Insurance

Dependent variables	(1) Religious donation$_{t+1}$	(2) Religious donation$_{t+1}$	(3) Secular donation$_{t+1}$	(4) Secular donation$_{t+1}$
Specifications	OLS	OLS	OLS	OLS
Income uncertainty$_t$	0.32***		0.21***	
	(0.04)		(0.04)	
Positive uncertainty$_t$		0.13***		0.07***
		(0.02)		(0.03)
Negative uncertainty$_t$		0.19***		0.14***
		(0.05)		(0.04)
Income$_t$	0.03	0.03	-0.05	-0.05
	(0.05)	(0.05)	(0.04)	(0.04)
Observations	296,092	296,092	296,092	296,092
R2-Adjusted	0.368	0.368	0.444	0.444
Dep. var. mean	0.84	0.84	0.58	0.58
Control variables	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES

Mechanism: Donation and Spiritual Insurance

- For both religious and secular donation, the predictive coefficient of negative income uncertainty is larger: When negative (positive) income uncertainty increases by one standard deviation, religious donations increase by $0.19 ($0.13), and secular donations increase by $0.14 ($0.07), over the next quarter.

Mechanism: Donation and Spiritual Insurance (Firm-level instrument)

	(1)	(2)	(3)	(4)
Dependent variables	Religious donation$_{t+1}$	Religious donation$_{t+1}$	Secular donation$_{t+1}$	Secular donation$_{t+1}$
Specifications	IV	IV	IV	IV
Income uncertainty$_t$	1.32**		0.70*	
	(0.67)		(0.40)	
Positive uncertainty$_t$		0.35		0.22
		(0.31)		(0.20)
Negative uncertainty$_t$		1.19*		0.34
		(0.72)		(0.46)
Income$_t$	0.11**	0.12*	-0.00	-0.02
	(0.06)	(0.06)	(0.04)	(0.04)
Observations	273,616	273,616	273,616	273,616
First-stage F-stat	400.3	170.5	400.3	170.5
Dep. var. mean	0.84	0.84	0.58	0.58
Control variables	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES
City × quarter fixed effect	YES	YES	YES	YES

Mechanism: Donation and Spiritual Insurance

- IV estimates confirms that income uncertainty predicts religious donations more pronouncedly, where the effect for religious donations is 89% larger than that for secular donations, and suggest the same qualitative pattern of larger point estimates for negative income uncertainty.

Mechanism: Donation and Spiritual Insurance

- Besides income uncertainty, a form of adverse shock related to religious donation is disease.

- Absent a spiritual insurance motive, health shock should reduce donation, but spiritual insurance would predict the opposite (because households under health shock are in urgent need of blessings and healing)

- We define health shock as incurring medical expenditures in the past quarter that are above the conditional median of the sample

- We examine whether people tend to *increase* religious donations when they experienced health shock thus defined.

Mechanism: Donation and Spiritual Insurance

Dependent variables	All donations$_{t+1}$ (1)	Religious donation$_{t+1}$ (2)	Secular donation$_{t+1}$ (3)	All donations$_{t+1}$ (4)	Religious donation$_{t+1}$ (5)	Secular donation$_{t+1}$ (6)
Occurrence of health shock$_t$	2.08***	1.98***	0.11			
(past quarter)	(0.23)	(0.20)	(0.12)			
Amount of health shock$_t$				0.44***	0.42***	0.02
(past quarter)				(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)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R2-Adjusted	0.402	0.369	0.443	0.402	0.369	0.443
Dep. var. mean	1.42	0.84	0.58	1.42	0.84	0.58
Control variables	YES	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
City × month fixed effect	YES	YES	YES	YES	YES	YES

146% increase

31% increase

Mechanism: Donation and Spiritual Insurance

Finding 2: We find that the predictive effect of income uncertainty on donations is more pronounced for religious donations and negative uncertainty,
and such relationship also exists for other adverse shock such as health shock.

Mechanism: Donation and Spiritual Insurance

- Test 3: **The Substitutability between Spirituality and Insurance**

- Will people reduce insurance purchases during the same period when they make donations,

- and if such a pattern exists, do donations affect the impact of uncertainty on insurance purchases?

$$insurance_{i,t+1} = \beta_1 donationdummy_{i,t+1} + \beta_2 income\ uncertainty_{i,t} + X'_{i,t}\gamma + \mu_t + \lambda_i + \varepsilon_{it}$$

$$insurance_{i,t+1} = \beta_1 donationdummy_{i,t+1} + \beta_2 income\ uncertainty_{i,t} + \beta_3 donationdummy_{i,t+1} \times income\ uncertainty_{i,t} + X'_{it}\gamma + \mu_t + \lambda_i + \varepsilon_{it}$$

Mechanism: Donation and Spiritual Insurance

Dependent variable	Insurance$_{t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
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)
Donation dummy$_{t+1}$	-80.40***			7.06		
	(25.76)			(37.03)		
Religious donation dummy$_{t+1}$		-98.67***			14.82	
		(32.58)			(48.70)	
Secular donation dummy$_{t+1}$			-54.08			0.14
			(37.90)			(52.96)
Income uncertainty$_t$ ×Donation dummy$_{t+1}$				-97.68**		
				(42.77)		
Income uncertainty$_t$ ×Religious donation dummy$_{t+1}$					-125.25**	
					(58.79)	
Income uncertainty$_t$ ×Secular donation dummy$_{t+1}$						-60.19
						(52.98)
Income	64.91***	64.97***	64.86***	64.68***	64.78***	64.80***
	(24.50)	(24.50)	(24.50)	(24.52)	(24.51)	(24.51)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Dep. var. mean	121.63	121.63	121.63	121.63	121.63	121.63

Mechanism: Donation and Spiritual Insurance

Dependent variable	Insurance$_{t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
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)
Donation dummy$_{t+1}$	-80.40***			7.06		
	(25.76)			(37.03)		
Religious donation dummy$_{t+1}$		-98.67***			14.82	
		(32.58)			(48.70)	
Secular donation dummy$_{t+1}$			-54.08			0.14
			(37.90)			(52.96)
Income uncertainty$_t$ ×Donation dummy$_{t+1}$				-97.68**		
				(42.77)		
Income uncertainty$_t$ ×Religious donation dummy$_{t+1}$					-125.25**	
					(58.79)	
Income uncertainty$_t$ ×Secular donation dummy$_{t+1}$						-60.19
						(52.98)
Income	64.91***	64.97***	64.86***	64.68***	64.78***	64.80***
	(24.50)	(24.50)	(24.50)	(24.52)	(24.51)	(24.51)
Observations	296,092	296,092	296,092	296,092	296,092	296,092
R2-Adjusted	0.215	0.215	0.215	0.215	0.215	0.215
Dep. var. mean	121.63	121.63	121.63	121.63	121.63	121.63

Mechanism: Donation and Spiritual Insurance

Finding 3: conditional on donating, people (1) spend less on insurance, and (2) their insurance spending is no longer related to background risks (Guiso and Jappelli, 1998).

Robustness Check

- Financial constraint does not explain negative giving-insurance:
  - Some are concerned that there may not be enough cash on hand to buy insurance.
  - The results still hold after we remove the financially-constrained individuals.

- No negative relation with insurance for non-giving consumption spending:
  - We do a placebo test with general consumption to replace donations.
  - Crowding out effect disappears.

Further Discussions

- ## Spiritual insurance or "mutual insurance"?
  - Dehejia, DeLeire, and Luttmer (2007) finds that religious donations are a form of mutual insurance.
  - Our unique institutional setting (broad-based charities) means that our result does not operate through mutual insurance.
  - Nevertheless, we replicate their mutual insurance test and confirm a null result.

- ## Wishful thinking or "devine blessing"?
  - Donations does not predict future income uncertainty.
  - Spiritual insurance exists only in one's perception but not reality.

- ## Increased altruism?
  - Individuals' own experience of uncertainty increase the level of sympathy. Finding 1 may be consistent.
  - Difference between religious and secular donation
  - Substitutability between donation and insurance

Further Discussion 1: Mutual Insurance

- Direct test: We replicate the specification of Dehejia, DeLeire, and Luttmer (2007) and find that the religious donations (in the form of a dummy variable) do not improve the degree of consumption insurance (the pass-through of income growth to consumption growth) in our data.

Dependent variable	Consumption growth$_{t+1}$		
	(1)	(2)	(3)
Panel A: Donation dummy in Year 1			
Income growth$_{t+1}$	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)
Donation dummy$_t$	348.21*		
	(189.55)		
Religious donation dummy$_t$		193.83	
		(245.92)	
Secular donation dummy$_t$			453.62*
			(267.58)
Income growth$_{t+1}$ × Donation dummy$_t$	0.01		
	(0.01)		
Income growth$_{t+1}$ × Religious donation dummy$_t$		0.02	
		(0.02)	
Income growth$_{t+1}$ × Secular donation dummy$_t$			0.01
			(0.02)
Control variables	YES	YES	YES
Observations	74,023	74,023	74,023
R2-Adjusted	0.01	0.01	0.01

Further Discussion 1: Mutual Insurance

- Direct test: We replicate the specification of Dehejia, DeLeire, and Luttmer (2007) and find that the religious donations (in the form of donation amount) do not improve the degree of consumption insurance (the pass-through of income growth to consumption growth) in our data.

Dependent variable	Consumption growth$_{t+1}$		
	(1)	(2)	(3)
Panel B: Donation amount in Year 1			
Income growth$_{t+1}$	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)
Donation amount$_t$	0.45		
	(0.41)		
Religious donation amount$_t$		0.41	
		(0.43)	
Secular donation amount$_t$			0.67
			(0.86)
Income growth$_{t+1}$ × Donation amount$_t$	0.00		
	(0.00)		
Income growth$_{t+1}$ × Religious donation amount$_t$		0.00	
		(0.00)	
Income growth$_{t+1}$ × Secular donation amount$_t$			0.00
			(0.00)
Control variables	YES	YES	YES
Observations	74,023	74,023	74,023
R2-Adjusted	0.01	0.01	0.01

Further Discussion 2: Does Donation Reduce Future Income Uncertainty Materially?

We find that religious donations (in the form of a donation dummy) does not predict future income uncertainty.

Dependent variable	Income uncertainty$_{t+1}$		
	(1)	(2)	(3)
Panel A: Donation dummy in Year 1			
Income uncertainty$_t$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Donation dummy$_t$	0.04		
	(0.03)		
Religious donation dummy$_t$		0.04	
		(0.04)	
Secular donation dummy$_t$			0.06
			(0.04)
Income$_t$	0.33***	0.33***	0.33***
	(0.01)	(0.01)	(0.01)
Observations	74,023	74,023	74,023
R2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES

Further Discussion 2: Does Donation Reduce Future Income Uncertainty Materially?
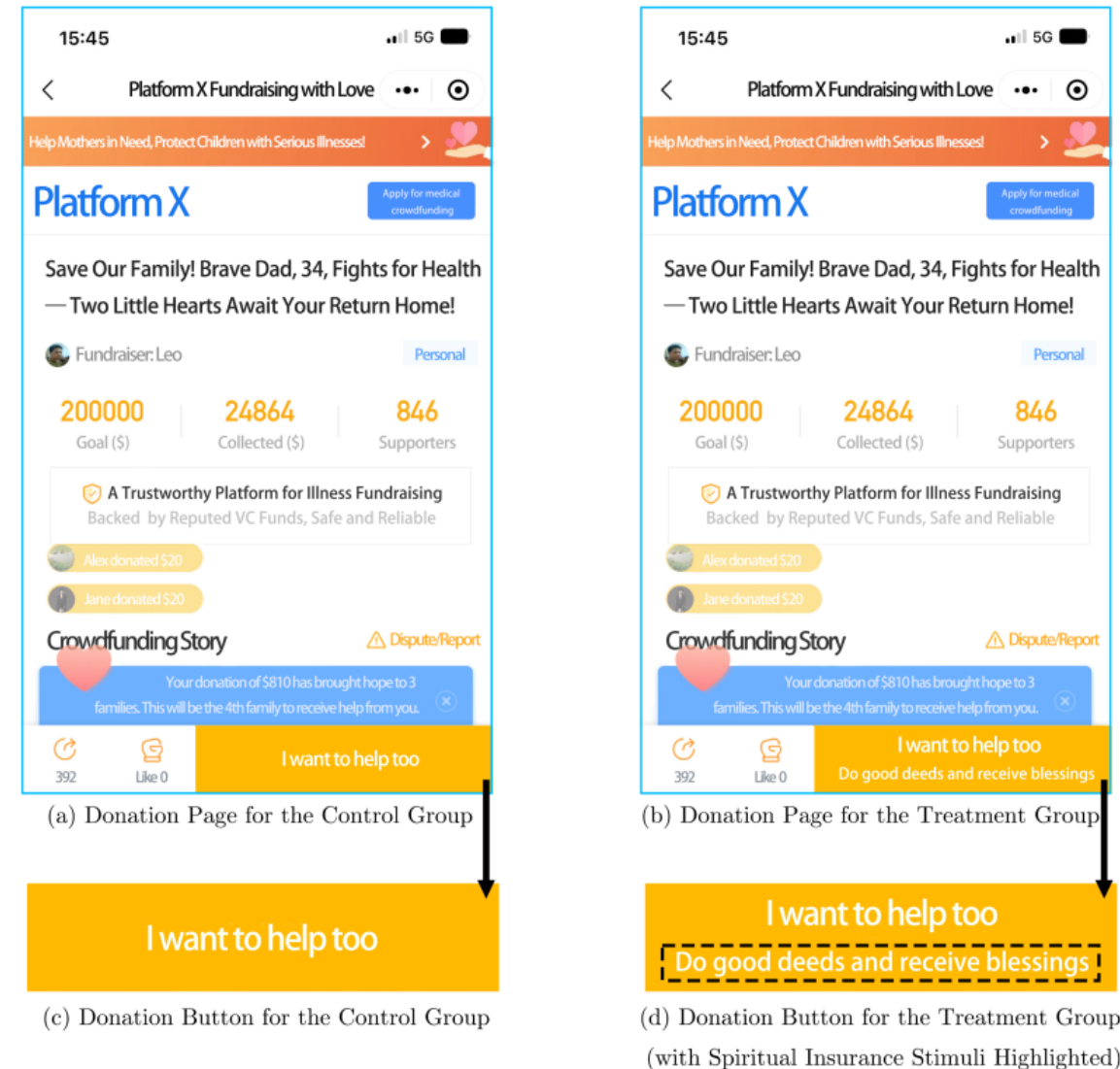
We find that religious donations (in the form of donation amount) does not predict future income uncertainty.

Dependent variable	Income uncertainty$_{t+1}$		
	(1)	(2)	(3)
Panel B: Donation amount in Year 1			
Income uncertainty$_t$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Donation amount$_t$	0.00		
	(0.05)		
Religious donation amount$_t$		-0.01	
		(0.09)	
Secular donation amount$_t$			0.01
			(0.10)
Income$_t$	0.33***	0.33***	0.33***
	(0.01)	(0.01)	(0.01)
Observations	74,023	74,023	74,023
R2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES

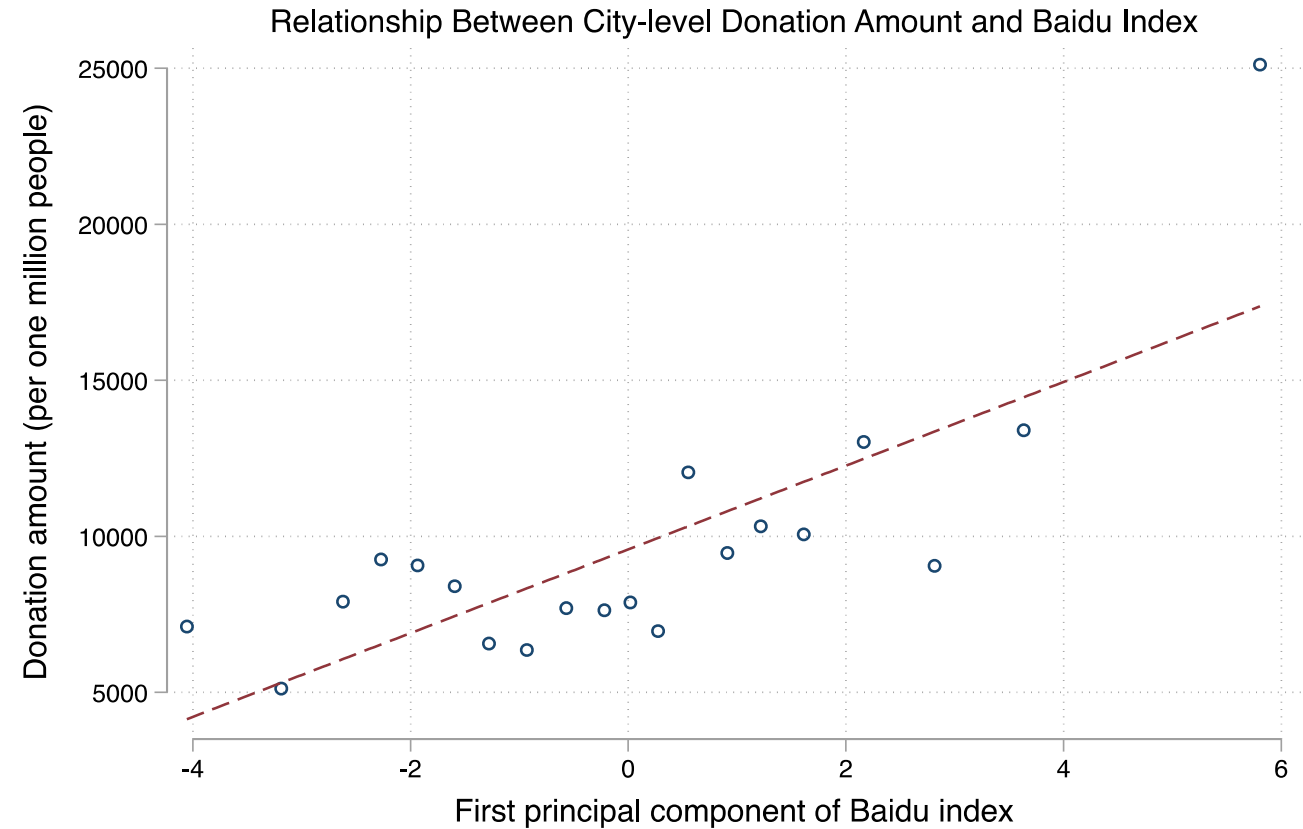# External Validity: Field Experiment on Spiritual Insurance Narratives

- From July to August 2022, a large online donation platform ("Platform X") in mainland China conducted an field experiment on millions of users.

- The experiment introduced spiritual insurance narratives via a modest visual cue.

- Users in the randomized treatment group will see an additional line of text **"do good deeds and receive blessings"** ("积善缘得福报") below the donation button.

- The treatment group are 0.93% more likely to donate than the control group in any given visit.

Figure 2: Illustration of the Field Experiment on Spiritual Insurance Narratives
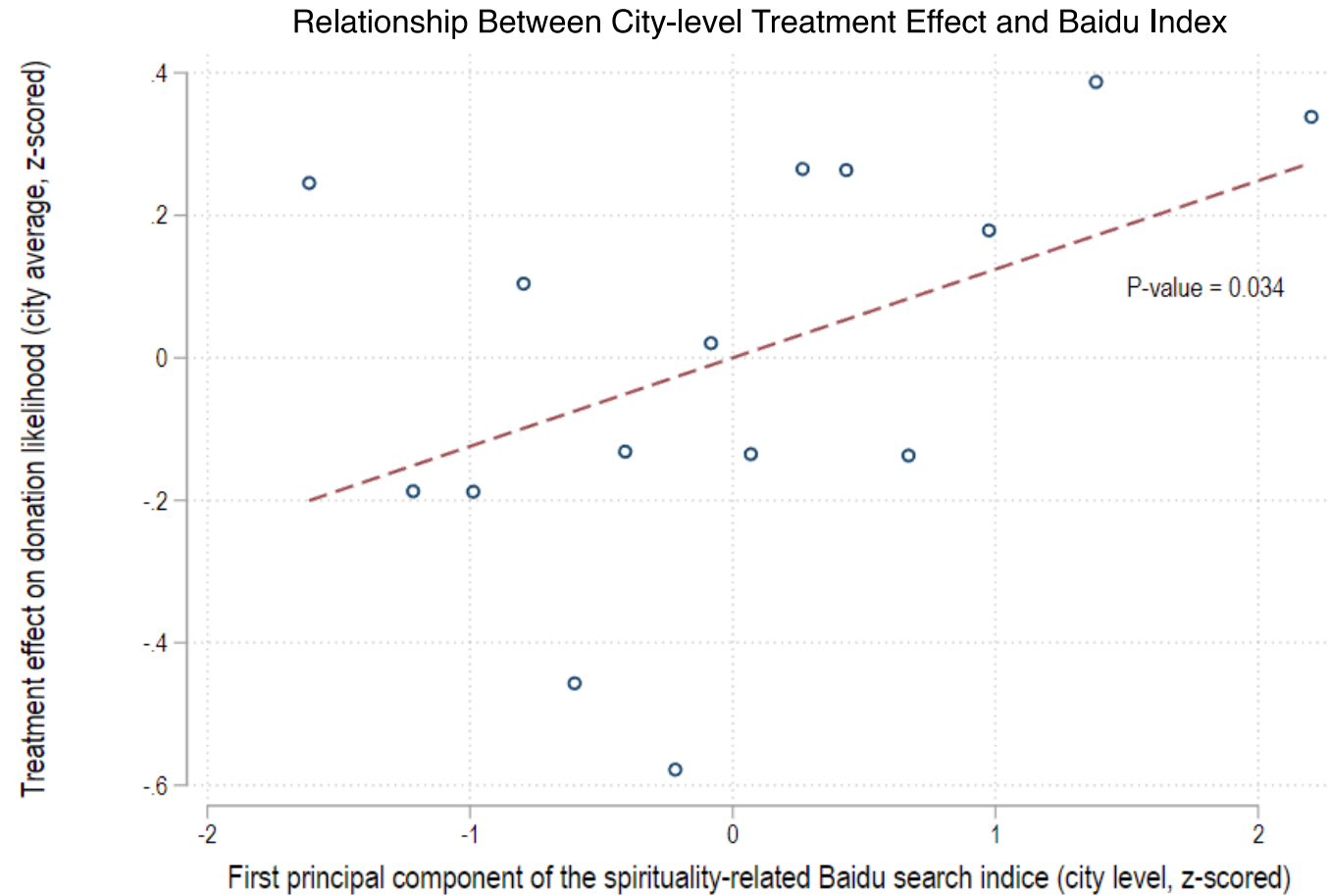
(a) Donation Page for the Control Group

(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)

External Validity: Positive City-level Correlation between Baidu Index of Spirituality and Donation Amount (Platform X)

Dependent variables	(1) Per-capita donations (city-level)	(2) Per-capita donations (city-level)
First principal component of the spirituality-related Baidu search indices	3363.303*** (573.835)	2488.144*** (822.926)
Per capita gross regional product		-1563.145 (1062.327)
Per capita retail sales		2524.516** (1027.773)
Per capita public expenditure		226.497 (1125.434)
Per capita public expenditure (science and technology)		-1219.129 (812.559)
Per capita public expenditure (education)		2024.067** (941.841)
Coverage of urban employee basic pension		-678.432 (709.608)
Coverage of urban employee public health insurance		-889.344 (863.603)
Coverage of urban employee unemployment insurance		3006.966** (1233.060)
Constant	9698.963*** (411.554)	9698.963*** (372.528)
Observations	290	290
R-squared	0.188	0.353

Relationship Between City-level Donation Amount and Baidu Index

External Validity: Positive City-level Correlation between Baidu Index of Spirituality and Treatment Effect (in Platform X's Field Experiment on Spiritual Insurance Narratives)

Dependent variables	(3) Treatment effect (city average)	(4) Treatment effect (city average)
First principal component of the	0.124**	0.174**
spirituality-related Baidu search indices	(0.058)	(0.068)
Per capita gross regional product		-0.094
		(0.128)
Per capita retail sales		0.033
		(0.108)
Per capita public expenditure		-0.070
		(0.154)
Per capita public expenditure		0.112
(science and technology)		(0.095)
Per capita public expenditure		0.044
(education)		(0.170)
Coverage of urban employee basic		0.029
pension		(0.112)
Coverage of urban employee public		-0.074
health insurance		(0.152)
Coverage of urban employee		-0.037
unemployment insurance		(0.138)
Constant	0.000	0.000
	(0.058)	(0.059)
Observations	290	290
R-squared	0.015	0.027

Relationship Between City-level Treatment Effect and Baidu Index

P-value = 0.034

Treatment effect on donation likelihood (city average, z-scored)

First principal component of the spirituality-related Baidu search indice (city level, z-scored)

Conclusion

- Using data from a leading commercial bank in Taiwan, we find that individual reacts to risks by increasing religious giving: higher income uncertainty and medical expenditure shocks leads to more donations, especially religious donations, inconsistent with known theories of giving, but consistent with the mentality of "donating for blessings" and "spiritual insurance".

- We further document a negative giving-insurance relation. Conditional on donating to religious organizations, people (1) buy less insurance, and (2) their insurance spending is no longer related to background risks.

- A field experiment on spiritual narratives that adds a "donating for blessings" phrase to the donation interface increases the likelihood of donation. These findings point to the explanation that religious donations serve as a form of spiritual insurance to cope with income uncertainty and other adverse shocks in life.

Literature

- Superstition in finance:
e.g. Slovic (JF '72), Hirshleifer (JF '02), Hirshleifer, Jian, and Zhang (MS '18), Bhattacharya, Kuo, Lin, and Zhao (MS '18), He, Liu, Sing, Song, and Wong (MS '19), Fisman, Huang, Ning, Pan, Qiu, and Wang (MS '22)

- Charitable giving:
List (JPE '02, JEP '11), tax avoidance (Meer, 2014; Duquette, JPubE '16), pure altruism (Becker, JPE '74, Fehr and Schmidt QJE '99, Bolton and Ockenfels, AER '00, Charness and Rabin QJE '02), warm-glow (Andreoni JPubE '88, JPE '89, Della Vigna et al. QJE '12)

- Effects of economic uncertainty on general consumption:
Kimball (ECMA '93), Eeckhoudt et al. (ECMA '96), Heaton and Lucas (JF '00), Viceira (JF '01), Cocco et al. (RFS '05), Gomes and Michaelides (RFS '08), Gormley et al. (JFE '10), Koijen et al. (JF '15), Yogo (JME, '16), Fagereng et al. (RES '18), Vestman (RFS '19), Choi and Robertson (JF '20), Kellner et al. (JPubE '19), Chen and Zhong ('21), Hu (JFE, '22)

- Motivated belief, wishful thinking, and endogenous expectations:
Bénabou and Tirole (QJE '02) and Bénabou (RES '13), Caplin and Leahy (QJE '01; '19), Brunnermeier (AER '05), Zimmermann (AER '20), Banerjee, Davis, Gondhi (JF '24)

Shift the prior on spiritual insurance

- The most related study is Auriol et al. (QJE 2020), who show that free funeral insurance reduced religious donations in an experiment in Ghana.

However:

- Only for Ghana? (secularization)

- Only for funeral risks? (e.g. related to death)

- Does donating for blessings really exist? Or was it just mutual insurance. (The Wave II, which arguably had low statistical power, did not replicate the "national thanksgiving offering" treatment effect, i.e. the effect on giving to broad-based religious charities).

We show:

- Solely giving to broad-based religious charities.

- Prominent risks such as income risks and health risks.

- Large-scale "donating for blessings" and "spiritual insurance" even among high income individuals.

- External validity inside and outside of experiments.

Thanks!

Model

- To formalize the empirical hypothesis, we provide a simple model about the relationship between income level/uncertainty and donations without and with spiritual insurance motive following the spirit of the model in Auriol et al. (2020).

- The agent is endowed with an uncertain income of $\tilde{I}$, with the realization having three states: $\bar{I} - D$ (bad state) and $\bar{I} + D$ (good state) each with probability $\bar{p}$, as well as $\bar{I}$ (neutral state) with probability $1 - 2\bar{p}$.

Model

- Before knowing the realization, the agent decides to put out g as donation.

- The agent's utility function is $E\left(u(\tilde{I} - g)\right) + \theta v(g)$

- Standard assumptions: $u(\cdot), v(\cdot)$ increasing and concave, $u'''(\cdot) > 0.$

- **Lemma 1:** In the model **without a spiritual insurance motive**, optimal donation g^* increases in expected income $\bar{I}$ and decreases in background risk D

Model

- **Spiritual insurance** (donation reduces the perceived probability of the bad state): subjective probability of the bad state, good state: $\bar{p} - \pi(g), \bar{p} + \pi(g), \pi'(\cdot) > 0, \pi''(\cdot) < 0$

- Objective function:

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

Model

- **Proposition 1:** In the model **with a spiritual insurance motive**, optimal donation g^* increases in expected income $\bar{I}$ (same as before). If the spiritual insurance motive is strong enough (i.e. the following condition holds), then optimal donation g^* rises in background risk D

$$\pi'(g^*)[u'(\bar{I} - g^* + D) + u'(\bar{I} - g^* - D)] > -\left[(\bar{p} - \pi(g^*))u''(\bar{I} - g^* - D) - (\bar{p} + \pi(g^*))u''(\bar{I} - g^* + D)\right]$$

- LHS: additional marginal benefit from spiritual insurance
- RHS: additional increase in marginal utility (income effect)

Model

- **Remark 1**: Regardless of whether the donation is motivated by spiritual insurance, optimal donation increases with expected income, so it is not possible to infer the existence of a spiritual insurance motive from the relationship between income levels and donations.

- **Remark 2**: When the spiritual insurance motive is sufficiently strong, **the optimal donation is positively related to income uncertainty**, exactly opposite to the prediction in the model absent the spiritual insurance motive.

Model

- **Extended model**: introduces expense risks (in addition to income risks) and insurance purchases

- **Proposition 2:** If the spiritual insurance channel is strong enough (depending on a condition similar to in Proposition 1), by reducing the perceived probability of the low-income state, donating more **reduces** the purchase of insurance; vice versa, the purchase of market-based insurance **reduces** donations. Further, if the spiritual insurance channel is weak or inexistent, the relationship is reversed.

- **Intuition:** gain from insurance product is especially high in low income state

Robustness Check: Unconstrained Consumers

- We keep only individuals that are highly unlikely to be liquidity constrained, and the finding is the same

Dependent variable	$Insurance_{t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Income uncertainty$_t$	101.27***	101.19***	100.92***	103.11***	102.70***	101.30***
	(8.33)	(8.33)	(8.32)	(8.40)	(8.39)	(8.33)
Donation dummy$_{t+1}$	-64.44**			39.77		
	(26.81)			(38.21)		
Religious donation dummy$_{t+1}$		-80.86**			58.71	
		(33.71)			(49.32)	
Secular donation dummy$_{t+1}$			-41.62			12.47
			(40.36)			(57.03)
Income uncertainty$_t$ ×Donation dummy$_{t+1}$				-116.78***		
				(44.07)		
Income uncertainty$_t$ ×Religious donation dummy$_{t+1}$					-153.38**	
					(60.51)	
Income uncertainty$_t$ ×Secular donation dummy$_{t+1}$						-60.94
						(56.51)
Income	43.37***	43.43***	43.31***	43.07***	43.16***	43.25***
	(9.48)	(9.48)	(9.48)	(9.47)	(9.48)	(9.48)
Observations	271,624	271,624	271,624	271,624	271,624	271,624
R2-Adjusted	0.130	0.130	0.130	0.130	0.130	0.130
Dep. var. mean	121.63	121.63	121.63	121.63	121.63	121.63

- We consider the individual as unlikely to be liquidity constrained if she has income to spare in every month. 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).

Further Discussion 1: Mutual Insurance

- **Alternative: religious donations as a form of mutual insurance**

- People donate for mutual support with their peers in the community (e.g., church).

- Excluded by:
  - our unique institutional setting (broad-based charities) means that our result does not operate through mutual insurance.
  - direct test: replicating the specification of Dehejia, DeLeire, and Luttmer (2007) and find that the religious donations do not improve the degree of consumption insurance (the pass-through of income growth to consumption growth) in our data.

Further Discussion 1: Mutual Insurance

- Direct test: We replicate the specification ofDehejia, DeLeire, and Luttmer (2007) and find that the religious donations (as a dummy variable) do not improve the degree of consumption insurance (the pass-through of income growth to consumption growth) in our data.

Dependent variable	Consumption growth$_{t+1}$		
	(1)	(2)	(3)
Panel A: Donation dummy in Year 1			
Income growth$_{t+1}$	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)
Donation dummy$_t$	348.21*		
	(189.55)		
Religious donation dummy$_t$		193.83	
		(245.92)	
Secular donation dummy$_t$			453.62*
			(267.58)
Income growth$_{t+1}$ × Donation dummy$_t$	0.01		
	(0.01)		
Income growth$_{t+1}$ × Religious donation dummy$_t$		0.02	
		(0.02)	
Income growth$_{t+1}$ × Secular donation dummy$_t$			0.01
			(0.02)
Control variables	YES	YES	YES
Observations	74,023	74,023	74,023
R2-Adjusted	0.01	0.01	0.01

Further Discussion 1: Mutual Insurance

- Direct test: We replicate the specification ofDehejia, DeLeire, and Luttmer (2007) and find that the religious donations (in the form of donation amount) do not improve the degree of consumption insurance (the pass-through of income growth to consumption growth) in our data.

Dependent variable	Consumption growth$_{t+1}$		
	(1)	(2)	(3)
Panel B: Donation amount in Year 1			
Income growth$_{t+1}$	0.03***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)
Donation amount$_t$	0.45		
	(0.41)		
Religious donation amount$_t$		0.41	
		(0.43)	
Secular donation amount$_t$			0.67
			(0.86)
Income growth$_{t+1}$ × Donation amount$_t$	0.00		
	(0.00)		
Income growth$_{t+1}$ × Religious donation amount$_t$		0.00	
		(0.00)	
Income growth$_{t+1}$ × Secular donation amount$_t$			0.00
			(0.00)
Control variables	YES	YES	YES
Observations	74,023	74,023	74,023
R2-Adjusted	0.01	0.01	0.01

Further Discussion 2: Does Donation Reduce Future Income Uncertainty Materially?

- We explore whether donations under spiritual insurance operate as a "self-fulfilling prophecy" i.e. less stress after such donations → perform better with work → as a result, experience less *future* income uncertainty

Further Discussion 2: Does Donation Reduce Future Income Uncertainty Materially?

Dependent variable	Income uncertainty$_{t+1}$		
	(1)	(2)	(3)
Panel A: Donation dummy in Year 1			
Income uncertainty$_t$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Donation dummy$_t$	0.04		
	(0.03)		
Religious donation dummy$_t$		0.04	
		(0.04)	
Secular donation dummy$_t$			0.06
			(0.04)
Income$_t$	0.33***	0.33***	0.33***
	(0.01)	(0.01)	(0.01)
Observations	74,023	74,023	74,023
R2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES

Further Discussion 2: Does Donation Reduce Future Income Uncertainty Materially?

Dependent variable	Income uncertainty$_{t+1}$		
	(1)	(2)	(3)
Panel B: Donation amount in Year 1			
Income uncertainty$_t$	0.39***	0.39***	0.39***
	(0.00)	(0.00)	(0.00)
Donation amount$_t$	0.00		
	(0.05)		
Religious donation amount$_t$		-0.01	
		(0.09)	
Secular donation amount$_t$			0.01
			(0.10)
Income$_t$	0.33***	0.33***	0.33***
	(0.01)	(0.01)	(0.01)
Observations	74,023	74,023	74,023
R2-Adjusted	0.351	0.351	0.351
Control variables	YES	YES	YES

Further Discussion 3: Increased Altruism

- **Alternative: increased altruism**

- Individuals' own experience of income uncertainty and adverse health shock increase the level of sympathy and hence altruism toward those who are in need.

- Excluded by:
  - difference between religious and secular donation.
  - substitutability between donation and insurance.

Heterogeneity: Job Subsample

Dependent variables	All donations					
	(1)	(2)	(3)	(4)	(5)	(6)
Job subsamples	Executives	Public sector employees	Owner-managers	Service-sector employees	White-collar employees	Blue-collar employees
Income uncertainty	1.44**	1.08***	0.73***	0.62***	0.52***	0.39***
	(0.57)	(0.40)	(0.21)	(0.23)	(0.09)	(0.09)
Income	-1.20	1.12**	0.02	0.14	-0.03	-0.04
	(0.81)	(0.53)	(0.19)	(0.20)	(0.09)	(0.10)
Observations	4,341	5,018	24,244	10,620	150,603	92,238
R2-Adjusted	0.122	0.501	0.366	0.519	0.419	0.434
Dep. var. mean	2.68	1.25	1.65	1.29	1.77	1.17
Control variables	YES	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES	YES
City × month fixed effect	YES	YES	YES	YES	YES	YES

Heterogeneity: Income Level

Dependent variables	All donations	All donations	All donations	All donations
	(1)	(2)	(3)	(4)
Subsample	Lowest 50% income	Highest 50% income	Lowest 50% wealth	Highest 50% wealth
Income uncertainty	0.50***	0.54***	0.54***	0.51***
	(0.08)	(0.08)	(0.09)	(0.08)
Income	0.02	-0.05	0.09	-0.10
	(0.07)	(0.09)	(0.10)	(0.09)
Observations	148,044	148,048	148,044	148,048
R2-Adjusted	0.399	0.399	0.332	0.446
Dep. var. mean	0.58	2.26	1.00	1.84
Control variables	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES
City × month fixed effect	YES	YES	YES	YES

Heterogeneity: Age and Gender

Dependent variables	All donations			All donations	
	(1)	(2)	(3)	(4)	(5)
Subsamples	Lowest 33% age	Mid 33% age	Highest 33% age	Male	Female
Income uncertainty	0.46***	0.63***	0.51***	0.56***	0.50***
	(0.10)	(0.11)	(0.11)	(0.09)	(0.08)
Income	0.23**	-0.20*	-0.16	-0.08	0.05
	(0.10)	(0.11)	(0.12)	(0.09)	(0.08)
Observations	112,060	91,720	92,312	158,636	137,456
R2-Adjusted	0.410	0.412	0.389	0.401	0.403
Dep. var. mean	0.51	0.54	0.56	1.68	1.41
Group-specific mean of uncertainty	1.40	1.58	1.72	0.07	-0.08
Group-specific sd of uncertainty	0.96	1.00	1.05	1.02	0.97
Control variables	YES	YES	YES	YES	YES
Individual fixed effect	YES	YES	YES	YES	YES
City × month fixed effect	YES	YES	YES	YES	YES

Discussion: Belief of Mutual Help and the HRS result in the United States

"South" is the Region (coarser than division, but finest level for the "people help others" question) with the most presence of prosperity gospel (i.e. spiritual insurance),

"South" has the lowest proportion of church-goers responding "people help others" instead of "people look out on one's own).

Proportion of Church-goers Responding 'People Help Others' by Census Region