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Superstition and Farmers' Life Insurance Spending

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Abstract

Superstition is prevalent in rural areas, yet very few studies examine whether it affects rural households' economic decisions. In this paper, we investigate the impact of "zodiac year" superstition on Chinese rural households' life insurance spending. We find a statistically significant 18.5% increase in life insurance expenditure during the head's zodiac year. Such a boost is only significant in the zodiac year and does not exist in non-zodiac years. Our study provides novel evidence that rural households would hedge "bad luck" by self-insurance when bearing superstitious beliefs.

Keywords: Superstition, Insurance, Rural Household.
JEL Codes: D91, G52, I13.

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Superstition and Farmers' Life Insurance Spending

1. Introduction

Superstition is prevalent in many developing countries' rural areas (Schmetzer, 1991). Nevertheless, there is no formal study, to our best knowledge, documenting whether and how superstition affects rural household's behavior.[1] In this paper, we focus on the "zodiac year" superstition and investigate the impact on Chinese rural households using micro-level data. Chinese astrology designates a person's birth year to twelve animal signs. The zodiac year is the year coinciding with an individual's animal sign and thus recurs every twelve years. People having such faith would believe that they are prone to experience adversity during the zodiac year. Therefore, our study examines whether rural households would consequently hedge such "bad luck" and spend more on life insurance.

Using a nationally representative survey of rural households, we are among the first to study this question in the context of an emerging market. Our most preferred empirical specification shows a significant 18.5% increase in rural households' life insurance spending during their zodiac years. We also find that such a boost is only significant during one's zodiac year (*i.e.*, not before and after) and is not driven by the omitted variables. These results suggest that cultural values have a subtle influence on rural households' economic decisions.

This paper contributes to two strands of literature. First, this study is related to the superstition literature (Shum *et al.*, 2014; Fisman *et al.*, 2020; He *et al.*, 2020). One key difference is that we focus on the rural households, who process the largest superstitious population in an emerging market (Schmetzer, 1991). Second, we add to the literature on the health economics of rural households from a cultural aspect. Extant literature studies the effects of health insurance from the willingness to pay (Asgary *et al*., 2004) and out-of-pocket expenses (Wagstaff *et al*., 2009). For instance, Asgary *et al.* (2004) investigate farmers' willingness to pay (WTP) for health insurance in Iran and find that most rural households' WTP is determined by social characteristics such as age, education, and health facilities. This study highlights the influence of cultural shocks on farmers' economic behaviors.

[1] Literature recently starts investigating how superstition affects investors, managers, and urban household behavior (Shum *et al.*, 2014, Fisman *et al.*, 2020, He *et al.*, 2020).

2. Empirical analysis

Data and summary statistics

Our data is from the National Rural Fixed-point Survey (NRFS), conducted by the Ministry of Agriculture of China. The NRFS is designed based on a multistage stratified random sampling strategy and could be considered a representative micro-data of Chinese rural households (Qian, 2008). Our household panel sample is from 2003-2008, as the survey containing household head information is available from 2003.

We follow Fisman *et al.* (2020) and use the household head's age to identify the zodiac effect. After dropping the missing age observations, our sample has 4,111 household-year observations. The variable definitions are listed in Table 1.

Table 1. Variable definitions.

Variable type	Variable name	Definition
Household	*Ln(Insurance+1)*	Natural logarithm of life insurance spending plus one.
	Family size	The number of family members.
	L.Total income	Natural logarithm of lagged one year's total income.
	L.Net income	Natural logarithm of lagged one year's net income.
Household head	*Zodiac*	A dummy variable equals one if the head is in his zodiac year and zero otherwise.
	Age	Household head's age in the survey year.
	Education	Household head's schooling years in the survey year.
	Male	A dummy variable equals one if the household head is a male and zero otherwise.

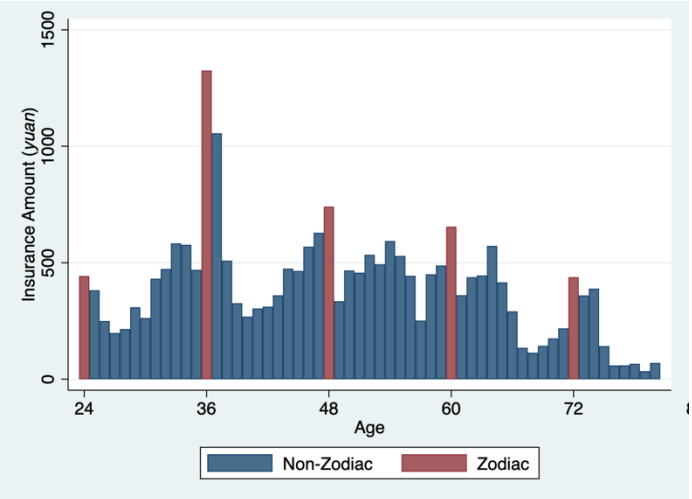
Table 2 reports the summary statistics. The household heads, on average, are 51 years old, and most of them are male (88%). The average household head's schooling year is six, indicating they are primary school graduates and are likely to be superstitious. The average (lagged) household total income is 26,876 RMB (=$e^{10.199}$), and the life insurance expenditure is 51.62 RMB (=$e^{3.944}$). In other words, rural households, on average, spend a tiny fraction on life insurance.

Table 2. Summary statistics.

Variables	Obs.	Mean	Std. Dev.	Min	Max
Ln(Insurance+1)	4,111	3.944	2.252	0	10.317
Family size	4,111	4.313	1.65	1	11
L.Total income	4,111	10.199	0.904	6.659	15.402
L.Net income	4,111	9.871	0.821	5.991	13.1
Zodiac	4,111	0.08	0.271	0	1
Age	4,111	51.303	10.779	24	80
Education	4,111	6.574	2.723	0	15
Male	4,111	0.888	0.316	0	1

Next, we depict the life insurance spending by age groups in Figure 1. This unconditional chart indicates that rural households tend to spend more on life insurance spending during their zodiac years (in the red bar). This effect is more pronounced in the age of 36 and 48, when farmers' incomes are higher in their life cycles.

Figure 1: The average amount of life insurance spending by age



Identification strategy

As pointed out by Fisman *et al.* (2020), the "zodiac year" superstition has a defining feature from an empiricist perspective since there is a (random) twelfth of the population in its zodiac year.[2] It enables researchers to examine the zodiac individual's economic behavior, using the

[2] Note that the zodiac proportion is 8% in our sample, which is consistent with the 1/12 random assignment.

non-zodiac-year peers as a benchmark. Concretely, we employ the following fixed-effect regression model to estimate the impact of farmers' zodiac year on their life insurance spending:

$$Ln(Insurance+1)_{it} = \beta_1 \times Zodiac_{it} + f(Age_{it}) + \boldsymbol{X}_{it} + \alpha_i + \gamma_t + \varepsilon_{it} \quad (1)$$

where $Ln(Insurance+1)_{it}$ is the natural logarithm of life insurance spending made by rural household *i* in year *t*. $Zodiac_{it}$, our variable of interest, denotes a dummy variable that equals 1 when the household head is in his zodiac year and zero otherwise. $f(Age_{it})$ is a functional form embedding the linear and quadratic controls of age. That is, we control for any first and second-order age effect on farmers' life insurance spending.

$\boldsymbol{X}_{it}$ is control variables of household (*Family size*, *L.Total income* or *L.Net income*) and the head's individual characteristics (*Male* and *Education*).[3] We include the *household* fixed effect (α_i) to control for any time-invariant household level unobserved factors that may correlate to life insurance spending. Besides, we control the *Province*×*Year* fixed effect (γ_{it}), which absorbs the year-varying regional macroeconomic shock. The standard error is clustered at the household level.

Main results

Column (1) of Table 3 shows the OLS results without age control. Quantitively, it suggests an 18.9% increase in life insurance spending during the head's zodiac year after controlling the family size and the lagged total income. The results remain the same if we use the net income instead of the total income, as reported in Column (2).

In Columns (3) and (4), we include the key controls (*Age* and Age^2), since the head's age could have both direct (linear) and marginal (quadratic) effects on the life insurance spending. The OLS estimates are still statistically significant at the 1% level, and the point estimates are quantitively similar to those without *Age* controls. Our most preferred specification (*i.e.*, Column 4) indicates an 18.5% boost in life insurance spending in the head's zodiac year.

[3] As the timing of year *t*'s income and insurance spending is not disclosed in the survey, we choose to report the results using the lagged household (net) income as the control. The results are quantitively similar if we use the contemporaneous income.

Table 3. The impact of zodiac year on life insurance spending.

	Dependent variable: *Ln(Insurance+1)*			
	(1)	(2)	(3)	(4)
Zodiac	0.189***	0.189***	0.185***	0.185***
	(0.0670)	(0.0671)	(0.0677)	(0.0679)
Family size	0.0634*	0.0665*	0.0646*	0.0679*
	(0.0366)	(0.0369)	(0.0375)	(0.0379)
Age			-0.0426	-0.0422
			(0.0623)	(0.0626)
Age^2			0.000430	0.000424
			(0.000584)	(0.000586)
L.Total income	0.0745		0.0764	
	(0.0523)		(0.0528)	
L.Net income		0.0135		0.0150
		(0.0580)		(0.0588)
Constant	2.897***	3.508***	3.876**	4.489***
	(0.582)	(0.618)	(1.670)	(1.682)
Head Characteristics	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes
Province×*Year* FE	Yes	Yes	Yes	Yes
Observations	4,164	4,142	4,133	4,111
R-squared	0.851	0.851	0.851	0.850

Notes: *, **, and *** denote significance at the 10%, 5% and 1% level, respectively.

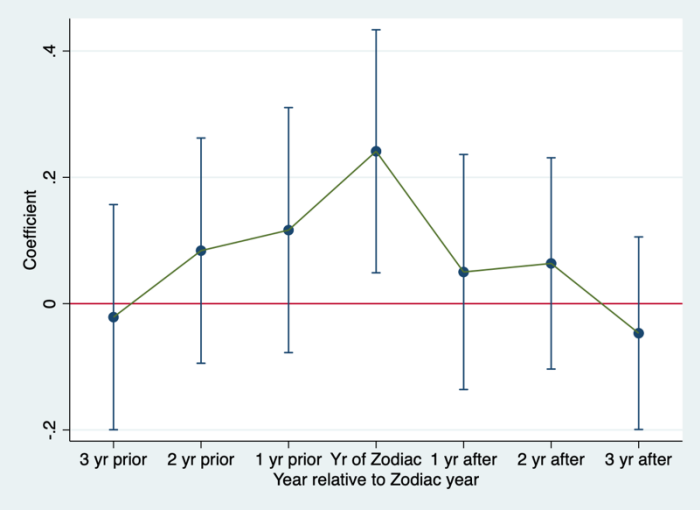
3. Robustness checks

The baseline OLS framework only admits a zodiac and non-zodiac comparison. There could be an "anticipation effect" (*i.e.*, insurance against before the zodiac year) that contaminates the results. To investigate such possibility, we take the following dynamic analysis:

$$Ln(Insurance+1)_{it} = \sum_{k=-3}^{3} \beta_{k+3} \times Zodiac(k)_{it} + f(Age_{it}) + \boldsymbol{X}_{it} + \alpha_i + \gamma_{it} + \varepsilon_{it} \quad (2)$$

where $Zodiac(k)_{it}$ means the kth year relative to i's zodiac year. As Figure 2 shows, only β_3 (*i.e.,* $Zodiac(0)_{it}$) is positively significant, and all the other years' coefficients are insignificant.

Figure 2: Dynamic effect of zodiac year beliefs on life insurance spending



4. Conclusions

This paper contributes to the literature by associating rural households' superstition with their life insurance spending. Our results show that households would increase their life insurance expenditure by 18.5% during the head's zodiac year, and the effect does not exist in non-zodiac years. Our study provides novel evidence that rural households would hedge "bad luck" by self-insurance. Future research might explore cross-country evidence on the superstition effect on rural households.

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