Routledge
Taylor & Francis Group

Economic Research-Ekonomska Istraživanja

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rero20

Is pension insurance a barrier to entrepreneurship? New evidence from China

Yian Chen, Li Guiping & Wenjing Gao

To cite this article: Yian Chen, Li Guiping & Wenjing Gao (2023) Is pension insurance a barrier to entrepreneurship? New evidence from China, Economic Research-Ekonomska Istraživanja, 36:3, 2155207, DOI: 10.1080/1331677X.2022.2155207

To link to this article: https://doi.org/10.1080/1331677X.2022.2155207

Published online: 22 Dec 2022.

ECONOMIC RESEARCH-EKONOMSKA ISTRAŽIVANJA
2023, VOL. 36, NO. 3, 2155207
https://doi.org/10.1080/1331677X.2022.2155207

Is pension insurance a barrier to entrepreneurship? New evidence from China

Yian Chen[a], Li Guiping[b] and Wenjing Gao[c]

[a]School of Economics, Southwest University of Political Science and Law, Chong Qing, China; [b]School of Management, ChongQing Institute of Engineering, Chong Qing, China; [c]School of Economics, Hangzhou Normal University, Hangzhou, China

ABSTRACT

This article provides evidence of the impact of pension insurance on entrepreneurship. It uses recent, nationally representative sample data from the Chinese General Social Survey (2013). We use a probit regression model to investigate whether the pension insurance converge rate affects the probability of a person becoming an entrepreneur. We find that the presence of both basic pension and business pension insurance reduce individual entrepreneurial probability. We also find that the two types of pension insurance do not appear to increase entrepreneurship among any particular subgroup, based on geo graphical regions, gender, education, social connection or marital status. Moreover, we argue that the basic pension and business pension insurance actually have a negative effect on the probability of small business entrepreneurship. Even, we have found there seems to be one important exception to this general pattern. For, most importantly, basic pension and business pension insurance have a positive effect on the probability of one particular kind of entrepreneurship: Innovation-driven entrepreneurship. Exploring possible mechanisms, we find that the important transmission channels through which pension insurance affects business creation is the lack of security and total family income.

ARTICLE HISTORY
Received 1 April 2021
Accepted 27 November 2022

KEYWORDS
Entrepreneurs; pension insurance; job lock; innovation-driven entrepreneurship

JEL CLASSIFICATIONS
J24; J45; J82

1. Introduction

Entrepreneurship is important driver of growth, particularly for an economy such as that of China (Gang, 1994). As the largest developing country in the world, China is facing huge challenges such as job creation and the process of urbanisation. The rate of entrepreneurship has not increased significantly during the period when the economy of China has continued to grow steadily. The persistent concern about the low rate of entrepreneurship has heightened the need for analysis about how to cause entrepreneurship to flourish in China. However, despite a strong interest in

CONTACT Li Guiping Liguiping1980@126.com

entrepreneurship, economists have devoted little attention to the effects of pension insurance on business creation. In this context, one natural question arises: Does the pension insurance coverage rate affect the probability of people becoming an entrepreneur?

Previous studies have reported that insurance is a crucial element of labour market selection by workers (Bailey, 2017; Fairlie et al., 2011; Holtz-Eakin et al., 1996; Lombard, 2001; Wellington, 2001; Zissimopoulos & Karoly, 2007). However, they do not appear to agree on the impact of the absence of insurance on business creation. A much-debated question is whether social insurance lowers job mobility and deters entrepreneurship. For example, Wellington (2001) reported that an environment in which a diversity of secure health insurance options are available might increase the likelihood of business creation. Also, Lombard reported that a woman is more inclined to decide in favour of self-employment if her husband has insurance. DeCicca also contends that the Individual Health insurance system operating within New Jersey increases the probability that people living in New Jersey will become entrepreneurs. In contrast, Holtz-Eakin et al. (1996) find that health insurance discourages people from leaving their jobs to start their own new firms. Furthermore, Fairlie et al. (2011) reports that employer-based insurance has a negative effect on job creation.

Given the lack of agreement among the few prior studies which touch upon the possible effect of health insurance on entrepreneurship, it seems that we simply do not know enough about the impact of pension insurance on entrepreneurship. In this article, we investigate the effect of pension insurance availability on the likelihood of entrepreneurship by examining the case of China.

First, we develop a new analytical framework to estimate the effects of pension insurance coverage rate on entrepreneurship. Second, using data from Chinese General Social Survey, we estimate a probit regression model to examine whether the pension insurance converge rate affects entrepreneurial decisions. The instrumental variable we use are the average value of other individuals participating in basic pension insurance in the same region. More specifically, we want to discover whether each of two types of pension insurance have different effects on entrepreneurship. We also want to uncover the mechanisms involved running from pension insurance to entrepreneurship.

This article demonstrates that both basic pension insurance and business pension insurance reduce the probability of individual entrepreneurship. It also reports that the two types of pension insurance do not appear to have increased entrepreneurship among any particular subgroup, based upon examination of geographical regions, gender, education, social connection and marital status. We find that *both* the basic pension and business pension insurance have a negative effect on the probability of small business entrepreneurship in general. However, surprisingly, we find that basic pension and business pension insurance both have a positive, statistically significant effect on the probability of one special type of entrepreneurship: innovation-driven entrepreneurship. Moreover, we find that the important transmission channels through which pension insurance affects business creation are lack of security and total family income.

Our study contributes to several aspects of the ongoing literature. First of all, we are the first to evaluate the effects of the pension insurance system of China on entrepreneurial decisions. A few studies have previously evaluated the influence of health insurance on entrepreneurship (Bailey, 2017; Blumberg et al., 2014; Fairlie et al., 2011; Gruber & Madrian, 2002; Heim & Lurie, 2010; Holtz-Eakin et al., 1996; Liu & Zhang, 2018; Lombard, 2001; Velamuri, 2012; Wellington, 2001), but to the best of our knowledge, no prior study has evaluated the effects of pension insurance on labour market outcomes. Second, our findings add to the debate about whether social insurance lowers job mobility and deters entrepreneurship (e.g., Fairlie et al., 2011; Gruber & Madrian, 2002; Heim & Lurie, 2010; Holtz-Eakin et al., 1996). Also, our results provide evidence of a causal effect of access to increase security and total family income on entrepreneurship. Finally, we emphasise the importance of the positive impact of basic pension and business pension insurance on innovation-driven entrepreneurship. Highlighting the role of innovation-driven entrepreneurship in economic growth is also especially insightful in the context of China, as the Chinese institutional context is quite different from that in Western countries.

The remainder of this article is structured as follows. Section 2 presents literature review. Section 3 introduces a conceptual framework. Section 4 presents data and variables and descriptive statistics. Section 5 introduces the empirical strategies and results. Section 6 presents a discussion and the conclusions.

2. Literature review

In this section, we briefly survey the large amount of literature on the effect of pension insurance on entrepreneurship. Entrepreneurship is a risky activity. As an important social welfare system, pension insurance not only affects residents' risk preference, but also affects residents' current and future family decisions (Zhou et al., 2015). A large quantity of economic studies have addressed the possible connection between pension insurance and entrepreneurship (Chen & Chen, 2015; Zhou & Liu, 2018; Zhou & Li, 2016; Ma & Meng, 2016).

One strand of this work focuses on the 'job-lock' effect from pension insurance (Zhou & Liu, 2018; Ma & Meng, 2016). Residents who participate in pension insurance have relatively stable jobs and incomes, and may not be willing to engage in risky activities. In other words, participation in pension insurance may have a 'job-lock effect' on their future entrepreneurial decisions (Zhou & Liu, 2018). For example, Ma and Meng (2016) reported some evidence that the increase in the proportion of pension insurance contribution will significantly reduce the probability of entrepreneurship. Zhou and Liu (2018) find that pension insurance has a significant 'lock effect' on entrepreneurship, and pension insurance has a negative impact on entrepreneurship by reducing the probability of financial risk investment.

Another strand of this literature examines the positive effect of receiving pension insurance on entrepreneurship (e.g., Chen & Chen, 2015; Zhou & Li, 2016; Zhou & Liu, 2018; Liu and Zhang,2020). Participation in pension insurance is voluntary behaviour, it indicates that insured residents have a certain level of income and pension insurance payment ability, which are more likely to engage in high-risk

venture investment, and can bear risks caused by entrepreneurship. So, participation in pension insurance may have a 'promoting effect' on entrepreneurial decisions (Zhou & Liu, 2018). For example, Chen and Chen (2015) find that pension insurance reduces individual entrepreneurial probability by an average of 2.1–2.5 percentage points, but pension insurance has a promoting effect on necessity-push entrepreneurship. Moreover, Zhou and Li (2016) show that enrolment in the New Rural Pension System has a significantly positive effect on one's chances of becoming an entrepreneur, but no significant effect on the asset and profit level of one's firm.

In the two strands of the existing literature outlined above, it is observed that although studies have devoted a large amount of attention to the subject, there is no consensus on whether pension insurance can promote or inhibit entrepreneurship.

3. A conceptual framework

Based on previous literature (Fairlie et al., 2011; Holtz-Eakin et al., 1996; Lombard, 2001; Wellington, 2001), this study will argue that pension insurance of an individual will affect their probabilitiy of becoming an entrepreneur. However, this raises the question of what determines the widespread perception of a link between pension insurance and entrepreneurship. To make our empirical analysis more reasonable, we first conceptually explain how pension insurance of a person affects their probability of becoming an entrepreneur from the following three perspectives: (a) lack of security, (b) total family income, and (c) risk sharing.

3.1. Lack of security

The first channel through which pension insurance might affect entrepreneurship arises from the close relationship between entrepreneurship and lack of security. If a country has sufficient pension reserves, its citizens may be expected to have a greater sense of security, and they will thus have greater self-confidence in their prospects for successful entrepreneurship and willingness to participate in somewhat risky investment opportunities. However, according to China Pension Actuarial Report (2019–2050), post-80s and post-90s, those who are relying solely on basic pension insurance can no longer feel a sense of security, for they must think more seriously about how to spend their old age after retirement. This report suggests that the possible insecurity of their future life after retirement inhibits and discourages people from engaging in entrepreneurship, and, as a result, such people tend to spend less in an effort to save more for retirement.

Generally speaking, the basic pension coverage is quite low and insufficient and at present, which makes residents feel insecure about their future. Furthermore, this perception of insecurity causes the long-term savings rate of people to be especially high. This high level of savings has become their main method to create a hedge against future risks. Usually, in western countries, young people decide to open their own businesses and they usually do not have savings. But it is not realistic in China, because the culture is different when young people get married, they usually have to buy a house in advance, which costs a lot of money, so it's not feasible without

savings especially for men. It has been reported that China's high housing prices discourage young people from starting businesses (Hu et al., 2019). As a result of all of this, most citizens of China do not have the courage to try to start their own business.

3.2. Total family income

In the present economy of China, the main reason is replacement rate inadequacy. This is the likelihood that the retired person will not have sufficient income to maintain a normal standard of living after retiring. Although according to OECD, 'The highest net replacement rate for low earners is found in China at 104.4%' and for average and above average earnings is among the highest in the world. Such a high replacement rate is only for a small number of groups. The replacement rate for civil servants is 90 percent, 80 percent for public institutions, and only 42.9 percent for corporate employees. China did not release the average pension level in 2020, but according to the report 'Embarking on a New Journey of High-quality Development of Social Security' by the Ministry of Human Resources and Social Security', the average monthly pension of enterprise employees increased from 1,686 yuan in 2012 to about 2,900 yuan in 2020. In 2020, the per capita pension is 2,900 RMB, and the average salary of urban non-private workers is 8,114.9 RMB. The replacement rate has been reduced to 35.7 percent. According to international practice, only when the pension replacement rate reaches 70% to 80% can a country achieve a relatively adequate pension. However, the pension replacement rate in China is low at present, which is 40% of the average social wage. Before 1999, the pension replacement rate of Chinese enterprise employees was generally maintained at more than 75%, but since then it has been declining year by year and has dropped to less than 40% now, which has aroused wide attention.

So, if they fear they will not have sufficient income for retirement, this implies they do not feel they have a sufficient surplus income to risk starting their own business.

3.3. Risk sharing

The second channel through which pension insurance might affect entrepreneurship arises from the close relationship between entrepreneurship and risk sharing. Blumberg et al. (2014) argue that people who are considering leaving the security and stability of a corporate job to become entrepreneurs should think about the financial risks associated with launching a new venture. In most states, leaving a job means that the person will give up the guarantee of subsidised insurance sponsored by the employer for the uncertainty of the non-group insurance marketplace. Besides, China's institution environment is not perfect, and entrepreneurship risks are high. Even if you start a new business, it is not easy to make money, it is risky to start a business. Many entrepreneurs lose all their money and find it is better to stay in the company, this is to say, they have to start working for a new company to survive.

Based upon the experiences of developed countries, basic pensions, enterprise annuities, and personal commercial pensions are the main components of pension insurance. However, in China, do government, children and elderly equally share responsibility for elders? The answer is no. Because the protection level that the government can provide is very low, and, at best, it can only provide enough income for a person to barely survive, the most reliable way for ordinary older people to achieve financial security is basic pension insurance. In fact, China's enterprise annuity system is not yet widely available, so the elders mainly rely upon basic pension insurance and business pension insurance.

4. Data and variables and descriptive statistics

4.1. Data

This study aims to deepen the general understanding of the entrepreneurial behaviour of individuals in China, and primarily examines the impact of individual insurance on entrepreneurship. To this end, we used nationally representative sample data from the CGSS for the following empirical analysis.

The Chinese General Social Survey (CGSS) originated in 2003. CGSS is the earliest comprehensive national academic annual survey project in China. CGSS comprehensively collects data from multiple levels of society, community, family, and individuals, summarises the trends of social change, and discusses topics of great scientific and practical significance. According to the most common interpretation of this survey data, there have been two stages of the CGSS project between 2003 and 2019. In order to closely track the link between pension insurance and entrepreneurship, we use the data from the second stage of the CGSS project, which was implemented between 2010 and 2019, for the empirical analysis (Wang et al., 2019).

The CGSS is among the most comprehensive and widely used large-scale survey projects in China. Because the CGSS collected information on the respondent's labour market choices, Urban/Rural Basic Pension Insurance, Commercial Medical Insurance and Business Pension Insurance, and other socio-demographic characteristics, the data from the CGSS were ideal for this study. Five sets of annual survey information are created and presented in publicly accessible from the 2010–2019 CGSS, together with the surveys completed in 2010, 2011, 2012, 2013, and 2015. Because the 2013 data includes the variables we need, we tend to use the sample of CGSS 2013 for the analysis in this study.

4.2. Variables

In our study of the CGSS (2013), to assess individuals' entrepreneurship, we used the single question of which of the following choice is more suitable for your current work situation. Nine options were available to the respondent: 1. I am the boss (or I am a partner); 2. I am an individual business; 3. I am employed by someone else (with a regular employer); 4. I am a labourer/labour dispatcher; 5. Part-time, casual labour (employees without a regular employer); 6. Work/help in your own business/company, get paid; 7. Work/help in your own business/company, without pay; 8.

Self-employed; 9. Else. Specifically, if the respondent said they 'are the boss (or partner)' during the interview, we consider them to be an entrepreneur. We also consider 'individual businesses' and 'self-employed' as entrepreneurs.[1]

The core explanatory variable, the individual's insurance status, was drawn from three questions regarding the insurance status. Each participant was asked: Are you currently participating in any of the following social security programs: (a) Urban/Rural Basic Pension Insurance; (b) Commercial Medical Insurance; (c) Commercial pension insurance. There were 11,438 observations, among which 68.07% participated in basic pension insurance, 8.21% participated in commercial Medical Insurance, and the remaining 6.05% participated in commercial endowment insurance. We assigned a value of 1 to respondents who were insured any one of these types of Basic Pension Insurance or Commercial pension insurance mentioned above, and assigned a value of 0 to those who were uninsured. Guided by the literature on the empirical studies of entrepreneurship (Le (1999) etc., Xu,2022; Olds,2014), the control variables related to each respondent included educational level, total annual income, household registration (hukou), age, gender, marital status, whether their spouse was employed, whether the individual was a member of the Communist Party of China, the number of years they had been working, and the frequency of social interaction during free time.

The variables and the descriptions of each used in the econometric analysis are listed in Table 1.

4.3. Descriptive Statistics

Table 2 lists the descriptive statistics of the variables. There were 11,438 observations in which males and females from an almost equal proportion. In the sample, 21.73% are entrepreneurs. The proportion of respondents participating in basic pension insurance, or business pension insurance was 68.07% and 6.05% respectively. The demographic variables demonstrated that 44.56% of the respondents resided in urban areas, 62.9% of spouses were employed, and 10.21% were CPC members. The average

Table 1. Description of variables.

Variable	Definition
entrep	If you have set up a business (1 = yes, 0 = no)
basic_insurance	If you are participating in basic pension insurance (1 = Insured, 0 = uninsured)
busi_retire	If you are participating in commercial pension insurance (1 = Insured, 0 = uninsured)
age	Age in years
age^2	Age squared
edu	Educational level (1–6, 1: illiterate; 2: primary school and below; 3: junior secondary school; 4: senior secondary school and its equivalent; 5: college diploma; 6: bachelor's degree and above)
logincome	Logarithmic total annual income
social	How often you are social (1 'rarely' 2 'sometimes' 3 'often')
sp_work	If your spouse is employed (1= employed, 0 = unemployed)
marriage	Marital Status (1 = married , 0= unmarried)
urban	1 = urban, 0= rural
work_year	Number of working years
party	If you are a CPC member (1 = yes, 0 = no)
gender	1 = male, 0= female

Data source: Chinese General Social Survey (2013) calculated by stata software.

Table 2. Descriptive statistics.

Variable	N	Mean	p50	SD	min	max
entrepr	4,597	0.2173	0.0000	0.4125	0.0000	1.0000
basic insurance	11,218	0.6807	1.0000	0.4662	0.0000	1.0000
busi_retire	11,389	0.0605	0.0000	0.2384	0.0000	1.0000
Age	11,437	48.5974	48.0000	16.3882	17.0000	97.0000
age2	11,437	2,630.2520	2,304.0000	1,655.0740	289.0000	9,409.0000
Edu	11,432	2.0226	2.0000	1.2687	0.0000	5.0000
logincome	9,072	9.6156	9.9035	1.1884	4.3820	13.8155
social	11,434	1.8874	2.0000	0.8059	1.0000	3.0000
urban	11,424	0.4456	0.0000	0.4971	0.0000	1.0000
sp_work	9,017	0.6299	1.0000	0.4829	0.0000	1.0000
marri	11,415	0.8901	1.0000	0.3127	0.0000	1.0000
wor_year	4,527	15.1401	13.0000	10.8256	1.0000	69.0000
party	11,372	0.1021	0.0000	0.3028	0.0000	1.0000
gender	11,438	0.5032	1.0000	0.5000	0.0000	1.0000
sma_busi	11,426	0.0712	0.0000	0.2571	0.0000	1.0000
Inno_driven	11,438	0.9289	1.0000	0.2570	0.0000	1.0000

Note: Chinese General Social Survey (2013), all variables used in this article are displayed.
Source: calculated by stata software.

education level of the respondents was junior secondary school, and the average age was 49 years.

5. Empirical strategy and results

5.1. Model and empirical design

In this section, first we used the probit regression model to examine whether the basic pension insurance participation of individual affected entrepreneurial decisions. The reason for using a Probit model is in our estimation equation, the error term does not follows the standard logistic distribution, but it follows the standard normal distribution. The probit equation to be estimated is as follows:

$$\Pr(entrepr_i = 1) = \phi(\beta basic\_insurance_i + \alpha X_i + u_i) \tag{1}$$

Second, to further examine the relationship between business pension insurance and entrepreneurship, we added the dummy variable of business pension insurance to the following form:

$$\Pr(entrepr_i = 1) = \phi(\beta + \gamma_1 busi\_retire_i + \alpha X_i + u_i) \tag{2}$$

Third, to further test the impact of pension insurance in general, either basic or business, we add an Eq. (3), including a dummy variable on whether a person has basic pension insurance or business pension insurance to the following form:

$$\Pr(entrepr_i = 1) = \phi(\delta + \beta_1 basic\_retire_i + \gamma_2 busi\_retire_i + \varphi X_i + u_i) \tag{3}$$

where $entrepr_i$ equals one if person i has set up a business or is self-employed and zero if not. $basic\_insurance_i$ is the basic pension insurance for individual i.$busi\_retire_i$ is the commercial pension insurance for individual i.X_i are the other control variables which included age, educational level, income, working status of spouse, household

registration (hukou), marriage, years of employment, and the frequency of social interacting during free time. u_i is the disturbance.

5.2. Benchmark test

The results of the main regressions are shown in Table 3. The coefficients give the marginal effects of the pension insurance on entrepreneurship. When we add one after the other our control variables (columns (1)–(2)), we find basic pension insurance significantly reduces individual entrepreneurial probability. In addition, Columns (3) and (4) also show that the business pension insurance participation rate significantly reduces the probability of a person becoming an entrepreneur. According to these findings, higher the participation of basic and business insurance, lower the entrepreneurial probability. This shows that enrolment in the Pension System has a significantly *negative* effect on the probability of a person becoming an entrepreneur.

Table 3. Probit regression of two types of pension insurance on entrepreneurship, Marginal Effects.

	(1) Entrepr	(2) entrepr	(3) entrepr	(4) entrepr
basic_insur	−0.3657***	−0.2492***		
	(−5.1847)	(−3.5215)		
busi_retire			−0.2456*	−0.2699*
			(−1.7257)	(−1.8224)
gender	0.0258	−0.0702	−0.0681	−0.0431
	(0.5081)	(−1.6045)	(−1.6220)	(−1.1057)
age	0.0465***	−0.0087	−0.0115	−0.0144
	(2.8966)	(−0.3893)	(−0.5355)	(−0.6272)
age2	−0.0005**	0.0002	0.0001	0.0002
	(−2.5041)	(0.5914)	(0.5458)	(0.6935)
edu1	−0.1805***	−0.1723***	−0.2867***	−0.2489***
	(−5.2104)	(−3.9327)	(−7.2919)	(−6.1027)
logincome		0.2468***	0.2395***	0.2507***
		(4.6251)	(4.4560)	(4.5537)
social		0.0581*		0.0612*
		(1.7879)		(1.8513)
sp_work		0.1117	0.1079	0.1129
		(1.0417)	(1.0455)	(1.0572)
marri		0.7137***		0.6933***
		(3.1255)		(2.9719)
wor_year		0.0001	−0.0042	−0.0031
		(0.0110)	(−1.1066)	(−0.7745)
party		−0.4245***		−0.4444***
		(−3.3646)		(−3.7241)
urban		−0.2688***		
		(−4.0401)		
_cons	−1.1783***	−3.2542***	−2.1965***	−3.1549***
	(−2.8890)	(−4.8994)	(−3.3504)	(−4.6260)
N	4521	3345	3410	3386
pseudo R^2	0.0453	0.0620	0.0430	0.0531

Note: Standard errors are clustered at province level and reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Controls include age, age^2, educational level, logarithmic total annual income, social frequency, number of working years and along with dummies for marital status, sex, party, the employment status of the spouse, and household registration. All data are from the Chinese General Social Survey (2013). Coefficients reported for probit regressions are the average marginal effects. Regression models are sample weighted using population.
Source: calculated by stata software.

5.3. IV Estimation results

The explanatory variables are chosen because they are thought to be exogenous, but we cannot rule out the possibility that there are additional omitted variables which simultaneously predict entrepreneurship and the explanatory variable of pension insurance or reverse causality. Thus, we tested for endogeneity by using an instrumental variable approach (IV) for probit regressions (Yueh, 2009).

The reduced form first stage regression is:

$$basic\_insur_i = \varphi + \gamma other\_basic_i + \eta X_i + \sigma \tag{4}$$

where the instrument $other\_basic_i$ is the average value of other individuals participating in basic pension insurance in the same region given in the survey year. Because the average value of other individuals participating in basic pension insurance in the same region is significantly related to whether the individual participating in basic pension insurance $basic\_insur_i$. However, the average value of other individuals participating in basic pension insurance in the same region is not correlated with whether the individual starts a business or not.

Columns (1)–(2) in Table 4 provide an argument on the validity of this instrument. Column (1) is the regression results of instrument $other\_basic_i$ on the residual term. We find that the instrument do not affect the residual term, that is, instrument cannot affect both explanatory and explained variables by affecting the residual term. Column (2) is the regression results of instrument $other\_basic_i$ and basic pension insurance $basic\_insur_i$ on $entrepr_i$. We find that the coefficient of the instrumental variable $other\_basic_i$ is not significant, but the coefficient of basic pension insurance $basic\_insur_i$ is significant, It suggests that the instrumental variable $other\_basic_i$ is exogenous and can only indirectly affect individual entrepreneurship by influencing $basic\_insur_i$.

Columns (3)–(6) in Table 4 show the Instrumental Variable Estimation result. Column (3) is the first stage regression results for basic insurance effect. We find that the $other\_basic_i$ variable given is positively and significantly correlated with basic pension insurance at the 5% level. However, there may still be a weak instrument problem. If the correlation between $other\_basic_i$ and basic pension insurance is very small and close to zero, and the instrument is valid, it can still be the case that the IV

Table 4. Two stage regression results for instrumental variable approach.

	OLS (1) residual term	OLS (2) entrepr	First stage (3) basic_insur	Second stage (4) entrepr	First stage (5) busi_retire	Second stage (6) entrepr
$other\_basic_i$	0.3043	0.3043	0.82e -06**		5.71e-02*	
	(1.02)	(1.02)	(2.49)		(1.92)	
basic_insur		−60.169*		−61.102*		−100.2383*
		(−1.99)		(−1.97)		(−1.69)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1912	1912	1912	1912	1933	1933
F-test			19.51		12.61	

Note: The robust t statistics are in parentheses. ***, **, * representing significance at 1%, 5% and 10%, respectively. The dependent variable in column (1) is the residual term. The dependent variable in Column (2) is entrepr. Column (3) and Column (5) gives the first stage regression results, the regression results of $other\_basic_i$ on individual basic pension insurance and business pension insurance respectively. Other variables are all controlled in the regression.
Source: calculated by stata software.

approach produces biased estimates. Staiger and Stock propose a rule of thumb to detect if there could be a weak instrument problem. If the F-statistic is less than 10 in the case of one potentially endogenous variable, then there is not a weak instrument. We compute a F-statistic of 19.51, thus suggesting that there is not a weak instrument problem. Column (4) is the result of the second-stage regression for basic insurance effect. We find that the regression results of basic insurance are still significantly negative.

Also, Column (5) is the first stage regression results for business insurance effect. We find that the $other\_basic_i$ variable given is positively and significantly correlated with business pension insurance at the 10% level. Then we compute a F-statistic of 12.61, thus suggesting that there is not a weak instrument problem. Column (6) is the result of the second-stage regression for business insurance effect. We find that the regression results of business insurance are still significantly negative.

So, these tests further imply that the instrument is informative and valid. This confirms the conclusion that there is a causal relationship between the pension insurance and entrepreneurship. It shows that after solving the endogenous problem, the outcome of the IV probit tests are basically the same as the benchmark probit test.

In the following sections, we examine the robustness of this finding, in particular whether it holds for important subgroups of entrepreneurs. It may be the case that while both the basic pension insurance and business pension insurance had a negative affect overall, the pension insurance may nevertheless still affect different types of entrepreneurship. We also explore the robustness of the main results by many possible specifications and subgroup analyses.

To summarise these results, we find that participation in basic pension and business pension insurance both significantly reduce the probability of becoming an entrepreneur. We also find that the two types of pension insurance do not appear to have increased entrepreneurship among any particular subgroup based on geographical regions, gender, education, social connection and marital status.

5.4. Heterogeneity by regions, education, gender, social connection, income and marital status

5.4.1. Four regions: East, northwest, southwest, Central and northeast

Table 5 shows the main results by four regions. First, we restrict our estimation to the east. Next, we perform the other exercise by retaining only Northwest, Southwest, Central and Northeast of the sample, respectively. The results are all similar to the baseline model (Table 3, Column (2)) that included all individuals. We find that increasing the basic pension insurance participation rate significantly reduces individual entrepreneurial probability.

5.4.2. Two subgroups by education level

Two types of pension insurance may also have heterogeneous effects by education. The results, provided in Table 6, show that for the 'College graduate' group and 'High school graduate' group, the impact of increasing basic pension and business insurance coverage on the probability of entrepreneurship are negative. However, for

Table 5. Estimated results by region, marginal effects.

	East	Northwest	Southwest	Central	Northeast
	(1)	(2)	(3)	(4)	(5)
	entrepr	entrepr	Entrepr	entrepr	entrepr
basic_insur	−0.2060**	−0.3080	−0.3828***	−0.1879	−0.5029**
	(−2.1879)	(−1.0857)	(−4.7392)	(−1.1051)	(−2.4332)
Controls	Yes	Yes	Yes	Yes	Yes
_cons	−4.4636***	−0.4615	−0.3534	−7.3233***	0.1238
	(−3.4374)	(−0.4579)	(−0.2263)	(−4.0399)	(0.0773)
N	1568	245	497	687	517
pseudo R^2	0.0623	0.0570	0.0974	0.1109	0.0854

Note: Coefficients reported are the marginal effects of probit regressions. Controls include age, age^2, educational level, logarithmic total annual income, social frequency, number of working years and along with dummies for marital status, sex, party, the employment status of the spouse and household registration. Standard errors are clustered at province level and reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Regression models are sample weighted using population. All data are from the Chinese General Social Survey (2013).
Source: calculated by stata software.

Table 6. Effect of two types of pension insurance on entrepreneurship by education, Marginal Effects.

	College graduate		High school graduate		No degree	
	(1)	(2)	(3)	(4)	(5)	(6)
	entrepr	entrepr	entrepr	entrepr	entrepr	entrepr
basic_insur	−0.4738*		−0.4851***		0.2220	
	(−1.6841)		(−3.6800)		(0.6980)	
busi_retire		−0.3410		−0.4607***		1.4182
		(−1.2529)		(−2.8682)		(1.0969)
Control	Yes	Yes	Yes	Yes	Yes	Yes
_cons	−6.4856***	−6.9005***	−2.9915***	−3.1022***	−3.8523*	−3.8067*
	(−6.6767)	(−6.6734)	(−3.3987)	(−3.5043)	(−1.8126)	(−1.7193)
N	1152	1178	902	906	84	84
pseudo R^2	0.0647	0.0620	0.0839	0.0753	0.0956	0.0980

Note: Standard errors are clustered at province level and reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Coefficients reported are the marginal effects of probit regressions. The group by 'College graduate,' 'High school graduate' and 'No degree" are based on educational level of the individual. Regression models are sample weighted using population. All data are from Chinese General Social Survey (2013).
Source: calculated by stata software.

the college graduate group, the marginal effect of business pension insurance on entrepreneurship is statistically insignificant. Also, it may be the case that basic pension and business insurance had no detectable effect for no degree group. The results show that both of the two types of pension insurance reduce the probability of a person becoming an entrepreneur, based on 'College graduate' group and 'High school graduate' group.

5.4.3. Men and women

The pension insurance policies of China can also have heterogeneous effects upon both men and women. Previous studies on entrepreneurship lock have typically found differential effects related to gender (for instance, see Gilleskie & Lutz, 2002). Women are more risk-averse (Borghans et al., 2009), have higher protections costs than men, and are less likely to start a risky venture. Table 7 shows the results of the main regression when the sample is split into men and women. The estimated marginal effect for both men and women is negative.

Table 7. Effect of pension insurance on men and women, marginal effects.

	Men (1) entrepr	Women (2) entrepr	Men (3) entrepr	Women (4) entrepr
basic_insur	−0.2212***	−0.2584***		
	(−3.0845)	(−2.8393)		
busi_medi			−0.2872**	−0.2310**
			(−2.5037)	(−2.0007)
controls	Yes	Yes	Yes	Yes
_cons	−4.3129***	−2.4549***	−3.7955***	−0.7617***
	(−5.7818)	(−2.6312)	(−5.1053)	(−22.0217)
N	2055	1290	2090	1814
pseudo R^2	0.0654	0.0894	0.0370	0.0022

Note: Standard errors are clustered at province level and reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Coefficients reported are the marginal effects of probit regressions. Controls include age, age2, educational level, logarithmic total annual income, social frequency, number of working years, along with dummies for marital status, sex, party, the employment status of the spouse, and household registration. All data are from the Chinese General Social Survey (2013).
Source: calculated by stata software.

Table 8. Effect of pension insurance on two social network groups, marginal effects.

	Low social (1) entrepr	High social (2) entrepr	Low social (3) entrepr	High social (4) entrepr
basic_insur	−0.2044***	−0.2965**		
	(−2.9583)	(−2.3675)		
busi_retire			−0.3293*	−0.3118
			(−1.8282)	(−1.5277)
Controls	Yes	Yes	Yes	Yes
_cons	−3.9532***	−2.0349**	−3.6135***	−0.7838***
	(−4.5486)	(−2.0222)	(−4.0964)	(−11.8799)
N	2055	1290	2090	1814
pseudo R^2	0.0644	0.0788	0.0378	0.0039

Note: Standard errors are clustered at province level and reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Coefficients reported are the marginal effects of probit regressions. Group is based on the mean of the variable social. If the value of the variable 'social' is below the median (1.8874), we classify it as 'low social network group,' and when the value of the variable 'social' is above the median (1.8874), we classify it as 'high social network group.' Controls include age, age^2, educational level, logarithmic total annual income, social frequency, the number of working years, and dummies for marital status, sex, party, employment status of the spouse, and household registration. Regression models are sample weighted using population. All data are from the Chinese General Social Survey (2013).
Source: calculated by stata software.

5.4.4. High and low social network groups

Table 8 shows the results of the main regression when the sample is split into a high social network group and a low social network group. Theoretically, social networks serve important functions of information collection and resource acquisition, helping potential entrepreneurs identify entrepreneurial opportunities, acquire resources needed for entrepreneurship, and tacit knowledge related to entrepreneurship. Therefore, it is more reasonable to assume that the pension insurance has entirely different impacts on the two social network groups. Surprisingly, we find the estimated marginal effect of basic pension insurance and business pension insurance on entrepreneurship is negative for both the high and the low social network groups. However, for the high social network group, the marginal effect of business pension insurance on entrepreneurship is statistically insignificant.

Table 9. Effect of pension insurance on two income groups, marginal effects.

	Low income (1) entrepr	High income (2) entrepr	Low income (3) Entrepr	High income (4) entrepr
basic_insur	−0.1903*	−0.2320***		
	(−1.7898)	(−3.6039)		
busi_retire			0.0183	−0.2220**
			(0.0712)	(−2.2812)
Controls	Yes	Yes	Yes	Yes
_cons	−0.2041	−6.0992***	0.9737	−6.2982***
	(−0.2153)	(−8.6539)	(0.7354)	(−8.8914)
N	759	2754	592	2791
pseudo R^2	0.0287	0.0941	0.0300	0.0933

Note: Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Coefficients reported are the marginal effects of probit regressions. Group is based on the mean of the variable logincome. If the value of the variable logincome is below the median (9.6155), we classify it as 'low income group,' and when the value of the variable logincome is above the median (9.6155), we classify it as 'high income group.' Controls include age, age2, educational level, logarithmic total annual income, social frequency, number of working years, along with dummies for marital status, sex, party, employment status of the spouse, and household registration. All data are from the Chinese General Social Survey (2013).
Source: calculated by stata software.

5.4.5. High and low income groups

Table 9 shows the results of the main regression when the sample is split into high and low income groups. We also find that the impact of increasing the participation rate of basic pension insurance on the probability of entrepreneurship is significantly negative for both groups. However, increasing the business pension insurance participation rate had a negative, statistically significant effect on the probability of entrepreneurship for the high income group only. For the low-income group, the marginal effect of business pension insurance on entrepreneurship is negative, but statistically insignificant.

5.4.6. Married and not married groups

Table 10 shows the results of the main regression when the sample is split into married and not married groups. Both the basic pension insurance and business pension insurance have a negative, statistically significant effect on the probability of entrepreneurship for married and not married groups.

5.5. Heterogeneity by two types of entrepreneurship: innovation-driven vs. small business

According to the much previous literature, there are two forms of entrepreneurship: innovation-driven entrepreneurship and small business entrepreneurship (for instance, Aulet & Murray, 2013). The two types differ in their potential impact on the economy. While small business entrepreneurship is risky, this type of entrepreneurship features a high likelihood of modest success if the entrepreneur executes their business well. If successful, the business owner can probably create at least a small number of jobs. In contrast, the business of innovation-driven entrepreneurship is extremely risky. As high proportion of high-tech entrepreneurial start-ups fail, and end up creating no jobs. However, if the entrepreneur succeeds at such a

Table 10. Effect of two types of pension insurance on entrepreneurship by marital status.

	Married (1) entrepr	Not married (2) entrepr	Married (3) entrepr	Not married (4) entrepr
basic_insur	−0.2345***	−0.7816***		
	(−3.9591)	(−3.7403)		
busi_retire			−0.1476**	−0.4684*
			(−1.9697)	(−1.6895)
Controls	Yes	Yes	Yes	Yes
_cons	−2.8637***	−4.4559***	−0.7011***	−1.6268***
	(−4.4444)	(−3.8074)	(−16.9165)	(−3.4349)
N	3308	549	3918	641
pseudo R^2	0.0633	0.1600	0.0009	0.0444

Note: Standard errors are clustered at province level and reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Coefficients reported are the marginal effects of probit regressions. The group by 'married' and 'not married' are based on the marital status of the individual. Married = 1, unmarried = 0. Data are from Chinese General Social Survey (2013).
Source: calculated by stata software.

Table 11. Effect of pension insurance on the two types of entrepreneurs, marginal effects.

	(1) sma_busi	(2) inno_driven	(3) sma_busi	(4) inno_driven
basic_insur	−0.2417***	0.2383***		
	(−4.2363)	(4.1833)		
busi_retire			−0.2490***	0.2494***
			(−2.6003)	(2.6047)
Controls	Yes	Yes	Yes	Yes
_cons	−2.5284***	2.5001***	−2.5502***	2.5276***
	(−4.1706)	(4.1262)	(−4.1703)	(4.1351)
N	3342	3352	3382	3392
pseudo R^2	0.0616	0.0614	0.0595	0.0595

Note: Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Coefficients reported are the marginal effects of probit regressions. If the individual hired fewer than 7 employees, the entrepreneur is classified as a small business. However, if the individual hired more than 7 employees, they are classified as an, innovation-driven entrepreneur. Controls include age, age^2, educational level, logarithmic total annual income, social frequency, number of working years, along with dummies for marital status, sex, party, the employment status of the spouse, and household registration. All data are from the Chinese General Social Survey (2013).
Source: calculated by stata software.

venture, they may create an extraordinary large number of jobs, including positions for people with master's-level graduates or PhDs in chemistry, engineering, and business (Aulet & Murray, 2013). Therefore, it is more reasonable to expect that the pension insurance will have different impacts on these two distinct types of entrepreneurship.

In order to determine how the pension insurance may have affected these two kinds of entrepreneurship differently, we re-run the main regression, but split the sample into innovation-driven and small business groups. Table 11 shows the results. We found that basic pension insurance have a negative, statistically significant effect on the probability of small business entrepreneurship. However, perhaps more importantly, our results show that both basic pension insurance and business pension insurance have a *positive,* statistically significant effect on the probability of entrepreneurship for innovation-driven entrepreneurship.

5.6. Transmission channels between the pension insurance and entrepreneurship

The empirical results displayed in Table 3 report that the two types of pension insurance have a negative effect on the probability of entrepreneurship. However, we have no empirical evidence to support the proposed channels within the conceptual framework through which the pension insurance affects the probability of entrepreneurship within China. Therefore, this section attempted to empirically decipher the transmission channels between the pension insurance and entrepreneurship. According to the conceptual framework, we focussed on three influencing channels: (a) Lack of security, (b) total family income, and (c) risk sharing.

First, in order to examine whether pension insurance can improve the sense of security of the individual, we regressed an ordinal variable of lack of security on the individual's two types of pension insurance. For the variable lack of security, we used the single question of how seriously are you concerned about being financially insecure during your old age in the CGSS. Five options were available to each respondent: (a) 'Very not serious,' (b) 'relatively not serious,' (c) 'neutral,' (d) 'relatively serious'; and (e) 'very serious.' The value of the responses ranged from 1 to 5, with a larger value indicating a greater concern about a sense of insecurity.

Second, in order to examine whether having pension insurance can increase the family total income, we regressed a binary variable of family income on the two types of pension insurance. The variable had a value of 1 when economic condition of a family was above the average, and otherwise, was assigned a value of 0.

Furthermore, we tested whether the pension insurance enhanced risk sharing, which influences the entrepreneurial decisions of individuals. For the variable *risk sharing*, we used the single question of who should take care of the elderly. In the CGSS data, four options were available to the respondent: (a) 'The government mainly takes care of the elderly'; (b) 'children mainly take care of the elderly'; 'The elderly take care of themselves'; (c) 'Government, children and elderly equally sharing responsibility.' Therefore, 'Government, children and elderly equally sharing responsibility' was used as a proxy for the risk sharing of individuals. Thus, we examined whether pension insurance was more likely to enhance the sense of risk share. Regarding the empirical strategy, we regressed a binary variable of risk sharing on the two types of pension insurance. The variable was valued 1 when government, children and elderly equally sharing responsibility, and 0 otherwise.

The results of the transmission channels test results are shown in Table 12. When controlling for some relevant variables, Columns (1) in Table 12 show that basic pension insurance is less likely to enhance the individuals' sense of security, thus reducing the entrepreneurial probability of the individual. In addition, Columns (2) in Table 11 show that business pension insurance can increase individuals' sense of security. However, this estimate is statistically insignificant.

Columns (3) and (4) in Table 12 show that basic pension insurance cannot improve the economic condition of families, so basic pension insurance significantly reduces individual entrepreneurial probability. Furthermore, we find that the business pension insurance increase one's chances of becoming an entrepreneur but statistically insignificant.

Table 12. The transmission channels behind the negative effect of the two types of pension insurance on entrepreneurship.

	(1) l_safe	(2) l_safe	(3) total_income	(4) total_income	(5) Risk_share	(6) Risk_share
basic_insur	−0.0773**		−0.0450*		0.0907**	
	(−2.5256)		(−1.7696)		(2.0120)	
busi_retire		0.0290		0.0563		−0.0045
		(0.4692)		(0.6077)		(−0.0700)
Control	Yes	Yes	Yes	Yes	Yes	Yes
_cons			0.1298***	−14.1968***	−1.2568***	−1.3072***
			(6.1803)	(−12.1347)	(−5.1231)	(−5.3805)
N	5507	5586	11218	3392	4409	4472
pseudo R^2	0.0006	0.0002	0.0002	0.3932	0.0225	0.0214

Note: Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Family total income has a value of 1 when the economic condition of the family is above the average and a value of 0 otherwise. The value of lack of security ranges from 1 to 5, and a larger value means a greater sense of insecurity. Risk sharing is valued 1 when 'Government, children and elderly equally sharing responsibility' was selected and 0 otherwise.
Source: calculated by stata software.

Column (5) in Table 12 shows that basic pension insurance had a higher likelihood of risk sharing, but because the basic pension replacement ratio is too low, it lowered the possibility of entrepreneurship. In addition, column (6) in Table 12 shows that business pension insurance decreases one's risk sharing but statistically insignificant. Therefore, it must be concluded that the risk sharing is not a channel by which pension insurance affects entrepreneurship.

At the personal level, the lack of security and total family income were associated with individual entrepreneurial probability. Therefore, we found support for the assertion that pension insurance decreases the chances of a person becoming an entrepreneur through the aforementioned two channels.

6. Discussion

Unlike previous studies of the impact of health insurance on entrepreneurship, in this article, we investigated the causal impact of pension insurance on entrepreneurship across China provinces. We estimate a probit regression model to examine whether the pension insurance coverage rate affects chances of people becoming entrepreneurs.

We find that both basic pension insurance and business pension insurance reduce individual entrepreneurial probability. The result indicates that a 1% increase in either of the two types of the pension insurance coverage rate is associated with a 0.2% decrease of chance a person of becoming an entrepreneur. These results could be due to the fact that there exists a misallocation of human capital between various industries in China. A substantial number of labourers give priority to having what they consider a secure job, such as work in the government bureaucracy or in a high-income monopoly industry. However, such preferences and attitudes tend to prevent a great deal of human capital from being available for business creation. The reason for this is that the social insurance converge rate is very high in these industries, so if individuals quit their jobs in one of these industries, the cost - and risk - to them is very high.

Across a wide variety of specifications, pension insurance appears to have had a negative and statistically significant effect on entrepreneurship. In addition, we find that the two types of pension insurance do not appear to have increased entrepreneurship among any particular subgroup based on geographic regions, gender, education, social connection and marital status. This result further confirms evidence from previous studies focussing on 'entrepreneurship lock' (e.g., Fairlie et al., 2011; Holtz-Eakin et al., 1996; Zissimopoulos & Karoly, 2007), which raises concerns that the current pension system does not promote the growth of entrepreneurship, and may actually be discouraging it.

While the main results are all negative, we still wondered whether it might be possible that pension insurance might be able to increase at least some specific types of entrepreneurship. Therefore, we re-run the main regression by splitting the sample into innovation-driven entrepreneurship and small business entrepreneurship groups. Once again, we find that both basic pension and business pension insurance have a negative effect on the probability of small business entrepreneurship. However, what was surprising was that basic pension and business pension insurance had a positive – and statistically significant – effect on the probability of *innovation-driven* entrepreneurship. Furthermore, the results demonstrated that the important transmission channels through which pension insurance affects business creation is the lack of security and total family income.

These results are important not only for understanding the nature of entrepreneurship, but also for formulating public policy in this area. This is particularly true because innovation-driven entrepreneurship is probably the most powerful source of job creation in China and other developing countries. Although we document that both basic pension and business pension insurance are negatively correlated with total entrepreneurial probability, the two types of insurance are positively correlated with innovative-driven entrepreneurship. Thus, public policies that improve the availability of basic pension and business pension insurance, as well as further reforms of the social pension system, are likely to pay large and significant dividends in the form of innovation-driven economic growth.

7. Conclusion

Despite a strong interest in entrepreneurship, economists have devoted little attention to the role of pension insurance on business creation. In this study, we develop a new analytical framework to estimate the effects of pension insurance coverage rate on entrepreneurship. Using data from the Chinese General Social Survey (2013), we estimate a probit regression model in order to examine whether the pension insurance coverage rate affects the probability of a person becoming an entrepreneur.

A search through many possible specifications and subgroup analyses shows that basic pension insurance and business pension insurance reduce the probability of a person becoming an entrepreneur. Our findings are consistent with the argument that comparatively low rates of entrepreneurship within the United States are because the country has less comprehensive pension coverage than observed in other affluent countries (Schmitt & Lane, 2009). One unanticipated finding of this study was that

both basic pension and business pension insurance significantly increase the probability of a person becoming an innovation-driven entrepreneur. We also found some evidence that the important channels through which pension insurance affects entrepreneurship are the lack of security and total family income. The findings provide new evidence on the causal mechanism between pension insurance and entrepreneurship.

These findings fill a gap within the literature that is related to insurance availability and market selections. However, these findings also have broader implications. First of all, our estimates offer some evidence that 'entrepreneurship lock' exists, for they document that social pension insurance discourage economic risk- taking such as that involved in entrepreneurship. Second, these results have implications for current policy. This is because even though the existing basic and business pension system does not promote entrepreneurship, basic pension and business pension insurance nevertheless do significantly increase the probability of people becoming innovation-driven entrepreneurs. Such entrepreneurs have a clear competitive advantage, and offer high growth potential for a country. If job creation and economic prosperity are the goals of the government of China, expanding basic pension and business pension insurance coverage and enhancing innovation-driven entrepreneurship must be major elements of government strategy and policymaking.

Third, since China is the country with the largest proportion of the senior citizens, the size of their ageing population is gradually increasing. Therefore, the government should facilitate and coordinate various forces for the support of older people, and make efforts to diminish their vulnerability to personal risks. If these things are done effectively, this will support the security and well-being of elderly citizens. If the elderly are able to live a life that is less stressful and more free of worry, this will strengthen the cohesion of society as a whole. In addition, implementing these policies will be of great significance for stimulating consumption and encouraging entrepreneurship.

Our article contributes to the existing literature in two ways. First of all, we address the limited research on the topic of 'entrepreneurship lock' by providing a new study of how pension insurance affects entrepreneurship in developing countries. Previous studies have primarily focussed upon how medical insurance might deter entrepreneurship, but relatively little attention has been paid to the possible impact of pension insurance on entrepreneurship. Therefore, this study extends previous research by emphasising the important role of business pension insurance for innovation-driven entrepreneurship.

Second, the present study explores, for the first time, the effects of pension insurance on entrepreneurship in China. These results should be of much interest to scholars and policymakers, because this work generates fresh insights into the effects of pension insurance on the two different types of entrepreneurships in China. In particular, we emphasise the importance of the positive impact of basic pension and business pension insurance on innovation-driven entrepreneurship. These types of positive impacts have implications for current policy, for such factors may be able to encourage and facilitate innovative-driven entrepreneurship in China and other emerging countries. Therefore, for example, we recommend that pension insurance reform should make the price of pension insurance cheaper for the employees of

innovation-drive companies involved in innovation-driven entrepreneurship, which has potential impact on the economy.

Finally, this article describes an exploratory study which outlines the empirical framework of the model of the impact that pension insurance has on entrepreneurship. This study was based on the example of the Chinese economy. Therefore, we outline the conceptual framework of such a model (pension insurance > lack of security, total family income, risk sharing > entrepreneurship).

It is important to recognise two limitations of our research. First, in order to isolate the net effect of pension insurance on the entrepreneurship of individuals, we have controlled for as many important entrepreneurship-influencing factors as possible. However, there might still be any number of control variables we have overlooked or omitted due to data unavailability. Second, we have only examined *three* possible transmission channels through which the two types of pension insurance might affect entrepreneurship. In fact, there might be various other possible channels that were not evaluated in our study. Despite these limitations, we believe that the selected study design and methods were appropriate for achieving the goals of the study, and for making some important contributions.

Looking to the future, the following lines of research may be desirable. First, our research has mainly focussed on the Chinese economy, but there is lack of relevant comparisons between China and other East Asian areas such as Japan, South Korea and Taiwan. Therefore, it would be interesting to investigate the relationship between pension insurance and entrepreneurship in such areas by using the datasets of Japan (JGSS), Korea (KGSS) and Taiwan (TCS) from the East Asian Social Survey Project (EASS). Second, our research has focussed primarily upon urban areas, so little attention has been paid to rural entrepreneurship. For example, it would be valuable to investigate the effects of the pension insurance converge rate on rural entrepreneurship. We would need to investigate this matter by using a difference-in-difference strategy provided by China's New Rural Pension System. A better understanding of such differences between urban and rural areas appears crucial for detailed policy prescriptions.

Note

1. We check whether changing the definition of entrepreneurs can lead to different results. For example, if the respondent said they "are the boss (or partner)" during the interview, we consider them to be an entrepreneur. We also consider "individual businesses", "self-employed" and work /help in your own business/company, without pay as entrepreneurs. We find that changing the definition of entrepreneurs can get robust results.

Disclosure statement

No conflict of interest has been reported by the authors.

Acknowledgments

First, we wish to express our thanks to Professor George W. Leeson, University of Oxford, for his valuable suggestions and comments on the earlier version of this article. Also, we are grateful to anonymous reviewers and other Professors' assistance of this manuscript.

Funding

This article was funded by the General project of Chongqing Natural Science Foundation (cstc2021jcyjmsxmX0333), and by Chongqing Municipal Education Commission Science and Technology Innovation Project (KJCX2020015), Chongqing Municipal Education Commission Science and Technology Research Project (KJQN202100302), Research Project of Southwest University of Political Science and Law (2021XZNDQN-08) and by Humanities and Social Science Project of Chongqing Education Commission (22SKGH017).

References

Aulet, W., & Murray, F. (2013). A tale of two entrepreneurs: Understanding differences in the types of entrepreneurship in the economy. Available at SSRN 2259740.

Blumberg, L. J., Corlette, S., & Lucia, K. (2014). The Affordable Care Act: Improving incentives for entrepreneurship and self-employment. *Public Policy & Aging Report*, *24*(4), 162–167.

Borghans, L., Heckman, J. J., Golsteyn, B. H., & Meijers, H. (2009). Gender differences in risk aversion and ambiguity aversion. *Journal of the European Economic Association*, *7*(2–3), 649–658. https://doi.org/10.1162/JEEA.2009.7.2-3.649

Bailey, J. (2017). Health insurance and the supply of entrepreneurs: New evidence from the affordable care act. *Small Business Economics*, *49*(3), 627–646. https://doi.org/10.1007/s11187-017-9856-8

Chen, Y., & Chen, G. (2015). Social insurance and entrepreneurship—An empirical study based on China's microsurvey. *Population and Economy*, *5*(6), 73–83.

Fairlie, R. W., Kapur, K., & Gates, S. (2011). Is employer-based health insurance a barrier to entrepreneurship? *Journal of Health Economics*, *30*(1), 146–162. https://doi.org/10.1016/j.jhealeco.2010.09.003

Gang, F. (1994). Incremental changes and dual-track transition: Understanding the case of China. *Economic Policy*, *9*(19), 99–122. https://doi.org/10.2307/1344602

Gilleskie, D. B., & Lutz, B. F. (2002). The impact of employer-provided health insurance on dynamic employment transitions. *The Journal of Human Resources*, *37*(1), 129–162. https://doi.org/10.2307/3069606

Gruber, J., & Madrian, B. C. (2002). Health insurance, labor supply, and job mobility: A critical review of the literature. *NBER Working Paper Series*, *9*, 8817.

Heim, B. T., & Lurie, I. Z. (2010). The effect of self-employed health insurance subsidies on self-employment. *Journal of Public Economics*, *94*(11–12), 995–1007. https://doi.org/10.1016/j.jpubeco.2010.08.007

Hu, M., Su, Y., & Ye, W. (2019). Promoting or inhibiting: The role of housing price in entrepreneurship. *Technological Forecasting and Social Change*, *148*, 119732. https://doi.org/10.1016/j.techfore.2019.119732

Holtz-Eakin, D., Penrod, J. R., & Rosen, H. S. (1996). Health insurance and the supply of entrepreneurs. *Journal of Public Economics*, *62*(1–2), 209–235. https://doi.org/10.1016/0047-2727(96)01579-4

Le, A. T. (1999). Empirical studies of self-employment. *Journal of Economic Surveys*, *13*(4), 381–416. https://doi.org/10.1111/1467-6419.00088

Liu, L., & Zhang, Y. (2018). Does non-employment based health insurance promote entrepreneurship? Evidence from a policy experiment in China. *Journal of Comparative Economics*, *46*(1), 270–283. https://doi.org/10.1016/j.jce.2017.04.003

Shiai, L., & Qilin, Z. (2020). The impact of pension insurance on family entrepreneurship and its mechanism: Based on the empirical evidence of Chinese Family Tracking Survey (CFPS). *Social Security Research*, *3*(5), 10.

Lombard, K. V. (2001). Female self-employment and demand for flexible, nonstandard work schedules. *Economic Inquiry*, *39*(2), 214–237. https://doi.org/10.1111/j.1465-7295.2001.tb00062.x

Ma, S., & Meng, X. (2016). Labor cost and family entrepreneurship: An empirical study based on corporate pension insurance payment. *Chinese Journal of Economics*, *10*(2), 110–137.
Olds, G. (2014). Entrepreneurship and public health insurance. *Harvard Business School Working Paper*, *20*, 16–144.
Schmitt, J., & Lane, N. (2009). *An international comparison of small business employment*. Center for Economic and Policy Research.
Velamuri, M. (2012). Taxes, health insurance, and women's self-employment. *Contemporary Economic Policy*, *30*(2), 162–177. https://doi.org/10.1111/j.1465-7287.2011.00256.x
Wang, Q., Li, Z., & Feng, X. (2019). Does the happiness of contemporary women in China depend on their husbands' achievements? *Journal of Family and Economic Issues*, *40*(4), 710–728. https://doi.org/10.1007/s10834-019-09638-y
Wellington, A. J. (2001). Health insurance coverage and entrepreneurship. *Contemporary Economic Policy*, *19*(4), 465–478. https://doi.org/10.1093/cep/19.4.465
Xu, W. (2022). Social insurance and entrepreneurship: The effect of unemployment benefits on new-business formation. *Strategic Entrepreneurship Journal*, *16*(3), 522–551. https://doi.org/10.1002/sej.1419
Yueh, L. (2009). China's entrepreneurs. *World Development*, *37*(4), 778–786. https://doi.org/10.1016/j.worlddev.2008.07.010
Zhao, Y., & Xu, J. (2002). China's urban pension system: Reforms and problems. *Cato Journal*, *20*(3), 21.
Zissimopoulos, J. M., & Karoly, L. A. (2007). Transitions to self-employment at older ages: The role of wealth, health, health insurance and other factors. *Labour Economics*, *14*(2), 269–295. https://doi.org/10.1016/j.labeco.2005.08.002
Zhou, D., & Liu, Y. (2018). "Shackle" or "Incentive"? Social insurance and entrepreneurship. *Scientific Decision*, *13*(06), 6–25.
Zhou, G., & Li, L. (2016). Does pension insurance promote rural entrepreneurship? *World Economy*, *15*(11), 172–192.
Guangsu, Z., Hua-Hua, X., & Li-Xing, L. (2015). The influence of trust on family entrepreneurial decision-making and its mechanism. *Management World*, *23*(12), 121–129.